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DESERET LANGUAGE
and
LINGUISTIC SOCIETY

Selected Papers from the
PROCEEDINGS

TENTH ANNUAL SYMPOSIUM

23-24 February 1984

Brigham Young University
Provo, Utah
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Brigham Young University
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Edited by Alan Melby
Linguistics Department
Brigham Young University

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We are very grateful to the Department of Linguistics at Brigham Young University for their generous financial support in publishing this report of the Tenth Annual Symposium of the Deseret Language and Linguistics Society.

Authors and titles of all of the contributed papers delivered at the symposium are listed by section. The table of contents lists selected contributed papers in alphabetical order by author after the invited paper.

The featured speakers were Evelyn Hatch (U.C.L.A.) and Gary Prideaux (University of Alberta). Prideaux's paper is found in this volume and Hatch's paper "An Experimental Model and its Application to Teaching" can be found (by prior agreement) in Current Approaches to Second Language Acquisition: Proceedings of the 13th Annual Linguistics Symposium at the University of Wisconsin - Milwaukee (forthcoming).

The authors of the articles printed herein are solely responsible for their content and accuracy.

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We thank all who participated in the Tenth DLLS Symposium, especially Dr. Hatch and Dr. Prideaux, for making it a stimulating academic experience.

Alan Melby
DESERET LANGUAGE AND LINGUISTIC TENTH ANNUAL SYMPOSIUM
February 23 and 24, 1984

Thursday, February 23, 1984

Robert Blair, Session Chairman

Setsuko Maeda  Native/Non-native Differences in Answering Questions

R. Kirk Belnap  Differences in ESL Lexical Boundary Acquisition: A Look at L2 English Boundaries of Native German Speakers According to Length of Residence in the United States

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Ronald Shook  The Two-Brain Theory and Rhetorical Practice

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Evelyn M. Hatch  A Model of Second Language Acquisition and Its Application in Teaching

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Marvin H. Folsom  Models for the Isaiah Passages in the German Translations of the Book of Mormon
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1. Introduction

When asked to present a broad overview of any particular area, one is bound to expose his own biases, no matter how fair and objective he attempts to be. Nevertheless there are general themes, attitudes, and research paradigms which do characterize activity within a field at any given time, and it is these which I hope to capture, at least in part, in the present paper.

The goal of psycholinguistics is to discover those rules, mental representations, structures, and processes which humans employ as they produce, comprehend, and acquire language. In addition, however, psycholinguists are interested in formulating general theories, or subtheories, about language use and form, and in integrating these with other, well-established facts and theories about cognition.

It is convenient to begin this survey with a brief sketch of the history of psycholinguistics as a background against which contemporary perspectives and research can be clearly seen and understood. Then, to provide concrete illustrations of current work, I will focus on two examples of relatively well-understood psycholinguistic phenomena. These are intended to highlight both assumptions and attitudes shared by many researchers working in psycholinguistics today. In closing, I will offer a brief assessment of progress to date.

2. Background

Linguistics and psychology seem to have experienced a mutual love-hate relationship over the past century. In late nineteenth century Europe there was considerable interaction between the few psychologists and historical linguists. Indeed Wilhelm Wundt's chair at the University of Leipzig was made in conjunction with that of Hermann Paul, an important historical linguist. With the advent of American structuralism, however, linguists tended to dissociate themselves from the mentalism of Wundtian psychology and extolled the virtues of autonomy and purity of discipline. In this structuralist period emphasis was placed on a description of linguistic forms, with a crude version of behaviorism just about the only psychologizing allowed. Here the two disciplines tended to diverge, with each losing something in the process. Psychologists were more interested in "verbal behavior" while linguists were interested in describing the forms of languages, overtly rejecting mentalism as having any relevance to linguistics.

This situation remained pretty much unchanged even with the advent of

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transformational grammar, with Chomsky (1957) arguing strongly in favor of the Bloomfieldian anti-mentalism. It was only later in the development of generative grammar (e.g., Chomsky, 1965) that a renewed interest in psychological issues emerged. It is of course well known that Chomsky and his major followers have since claimed that linguistics is really a special case of theoretical psychology. Thus once again, at least in principle if not in practice, linguistics and psychology turned sympathetically toward one other. It is interesting to note that linguistics' interest in cognition emerged at about the same time as a growing interest in cognitive psychology was taking place. Indeed, Neisser's Cognitive psychology, that landmark of the reemergence of mentalism in psychology, was published in 1967.  

Although linguists in the early and mid 1960s proclaimed allegiance to mentalism, much of the activity within linguistics proper remained quite untainted by either methods or concerns of psychology. Transformational grammarians continued research within a structuralist tradition, but now in terms of a theoretical framework in which syntax could be neatly treated. In fact, it can, and has been, argued (Prideaux, 1971; Steinberg, 1982) that work in generative grammar constitutes a logical extension of the structuralist enterprise rather than a revolutionary paradigm change.

For their part, psychologists quickly became enamoured with the apparent successes of transformational grammar and asked the obvious question as to whether actual language processing (that is, comprehension, production, and acquisition) might not involve those theoretical operations posited by linguists. Thus was born the (in)famous "derivational theory of complexity" and its language acquisition counterpart the "cumulative theory of language acquisition" (Brown & Hanlon, 1970). These theories, which hypothesized that language processing is a monotonic function of transformational complexity, prompted a flurry of psycholinguistic experimentation, much of which initially appeared supportive (e.g., Miller & McKeen, 1964; Savin & Perchonock, 1965; Clifton & Odom, 1966). After early successes, however, internal theoretical reasons and external experimental results came to suggest that the derivational theory of complexity was incorrect. Not only were some relatively complex sentences fairly easy to process, but also some relatively simple ones turned out to be quite hard to process (cf. Fodor, Bever, & Garrett, 1974). Unfortunately, the failure of the derivational theory of complexity and the cumulative theory of language acquisition tended to cause yet another rupture between some linguists and psychologists, with the result that, on the one hand many linguists once again ignored experimental results in their theorizing, while on the other, many psychologists ignored the role and importance of syntactic form in language processing.

The keystone of the derivational theory of complexity and its language acquisition companion was the central role played by syntax. Indeed, syntax was viewed as the driving force in language processing. However, just as psycholinguists came to recognize that other factors were also important from a psychological point of view, so did linguists begin to

turn their attention to such matters as the complex nature of the lexicon, pragmatics, presuppositions, the role of context, the nature of discourse, and the like. Thus, advancements in both linguistics and psychology led to the realization that language is a complex set of subsystems, all of which not only interact but also influence one another in very important ways.

At this point, then, a broader approach to psycholinguistic research emerged — an approach in which a variety of factors is seriously considered as being relevant to language processing. At the same time new and elaborate experimental methodologies have come to be developed to test hypotheses involving such factors.

3. Current Approaches

With the advent of a more eclectic attitude comes a series of basic assumptions, and since these are often only implicit in the work of many psycholinguists, it is useful to make them clear and overt. The first concerns the nature of language. While generative grammarians often treated a language as a formal object, namely a "set of sentences," most psycholinguists view a language as a vehicle for communication, adopting a more functional and instrumental perspective on the nature and use of language.

As a corollary to the first assumption is a second, namely that language consists of a highly complex and interacting set of subsystems. This is often termed a "modular" view of language systems, and although the term means something rather different within formal linguistics, it is still a fruitful perspective to adopt in psycholinguistics, since it allows us to isolate various subsystems and examine their properties in detail. Moreover, this approach also permits us to examine more clearly the interactions and interpenetrations among the various subsystems.

A third assumption underlying most work in psycholinguistics is that research should be focused on the language user and not just on the form of sentences. After all, it is the speakers' and hearers' knowledge, rules, and structures, that we are trying to uncover.

A fourth assumption concerns the nature and location of meaning. While formal linguistics often treats meaning as a static, often literal, constellation of elements or features, the psycholinguist must accept the fact that meaning is a dynamic phenomenon residing in the speaker when he utters a sentence and which is reconstructed by the hearer as he attempts to comprehend. Moreover, as we all recognize, a given sentence can have vastly different meanings in different contexts. For example, "You played a great game" might be a sincere compliment in one circumstance and a cruel insult in another.

Finally, the psycholinguist recognizes the essential need for establishing empirical evidence in support of hypothesized explanations for linguistic phenomena. He realizes that it is not enough to speculate on how language might function; rather he realizes that he must produce scientifically viable reasons for his conclusions about those rules, structures, and processes which he claims are mentally real. Formal evidence
and argumentation alone is insufficient.

Since the modular approach to language looms so large in modern psycholinguistics, it is important to specify just what some of these components actually are. Perhaps the most obvious is that of the grammar, by which we mean that set of linguistic devices (structures, word order, morphology, etc.) which the language user employs to relate meaning and forms. We have no assurance that the formal grammar of the linguist is also that which is "internalized" by the native speaker, however. Rather, the linguist's proposals for rules or structures can at best serve as hypotheses which are to be evaluated empirically by the psycholinguist. After all, it is the psychologically viable rules and structures which the psycholinguist is attempting to find.

The lexicon, that mental dictionary in which the forms, meanings, and relations of words is stored, constitutes a second important component. Much research in psycholinguistics over the last several years has addressed the question of how and to what extent the child learns his inflectional and derivation morphology. What actually constitutes evidence for the claim that a mental relation exists between forms like wild and wilderness or galaxy and lactate, for example? Such questions provide information as to the nature of the mental lexicon.

Obviously, the speaker's knowledge of the sound system of his language, the phonology, is a further important component. It is crucial to learn, for example, whether the rules the linguist posits for such diverse phonological phenomena as voicing assimilation and vowel harmony actually represent the mental knowledge of the speaker and hearer.

The role of context and discourse is also an important consideration in psycholinguistics. After all, most sentences do not occur in isolation: they are rather integrated into various kinds of discourse, and the contexts in which they are found often strongly governs the particular forms sentences will take. Moreover, if we limit attention only to sentences in isolation, we will doubtless miss many important factors about the structure of sentences and their discourse functions.

A further, albeit somewhat vague, component of pragmatics must also be acknowledged. This refers to that general knowledge of the world, as well as of cultural and social conventions and situations, which aid us in constructing the meanings of sentences. We must admit that much of our knowledge of the world is to a great extent independent of our language (e.g., we all know that people can smile but stars cannot), but this knowledge is highly relevant in our interpretation of sentences (as in "The sun rose smiling in the east").

One final component, rather different from those cited above, is that of the processing strategies or heuristics which we employ as we construct, comprehend, and acquire language. These involve general cognitive processes which might have relevance in domains other than language, but which can be shown, for instance, to interact with language structures to facilitate comprehension.

Most of these notions or components are familiar, with the possible
exception of the last, those processing strategies which we employ in conjunction with our knowledge of our grammar, pragmatics, etc. as we encode or decode language. Once we adopt a modular view of language subsystems, we can then isolate and address research issues in a relatively straightforward manner, but when we adopt a position which holds that one or another of these factors is central or primary, we tend to prejudge our results. It is important, therefore, not to assume we know the answer to our research questions prior to experimentally testing them, for if we did, then there is no point at all in such testing.

A further set of factors also characterizes current approaches to psycholinguistics, although these are not so easy to enumerate as those mentioned above. These include the fact that the interaction of components may be extremely complex, contrary to our a priori assumption that they are relatively simple. For example, native speaker judgements about relative acceptability of two different sentences may be a function not only of their structural differences but also of their relative semantic plausibility or even believability. Another important methodological aspect is that a particular linguistic phenomenon may result from several distinct causes or factors rather than from just one. Thus, not only the structure of a sentence but also the processing strategies and even lexical items involved may contribute to the processing ease or difficulty of the sentence. Similarly, in one context a sentence might be highly appropriate and easy to understand, but in another context, the same sentence might be viewed as utterly bizarre. Finally, within modern psycholinguistics considerable emphasis lies on establishing methodologically firm experimental techniques for acquiring reliable and valid data relevant to empirical questions. Without successful methods, psycholinguistics simply cannot progress.

These assumptions and methodological considerations at least partially characterize much of the current work in psycholinguistics, but in order to illustrate the kinds of research actually carried out, specific examples are needed.

The psycholinguistics literature is filled with examples of studies dealing with the role of syntax in comprehension, the acquisition of phonology, and the like. There is, however, relatively less published research dealing with either contextual constraints on the forms of sentences or with cognitive strategies. Therefore I have chosen these two areas to illustrate the directions and attitudes of much current psycholinguistic research. Rather than spend time on the details of various studies, I have instead chosen to focus on an interpretation of those results. The reader is referred to original sources for details. The specific examples discussed here are both well documented and fairly widely accepted, although there are, as is both healthy and necessary, some scholars who disagree with the interpretations offered here.

4. English Datives and the GIVEN-NEW strategy

English contains pairs of sentences like those in (1), beside each of which is a statement of the linear structure of the sentence in terms of functional notions such as subject (S), verb (V), direct object (DO) and indirect object (IO).
Such sentences contain both a direct and an indirect object, although the orderings of the two objects is reversed in the two sentences. Furthermore, in the structures like (1b), the indirect object marker to is eliminated. There are many verbs which can take both a direct and indirect object (e.g., sell, buy, lend, bring, take, etc.) and accordingly, the structural relationship between the sentences in such pairs is quite productive. Within transformational linguistics, the relationship has typically been treated in terms of a transformation of "Dative Movement," which under certain conditions optionally moves the IO to a position before the DO, with the concomitant loss of the preposition to.

The interesting question for psycholinguistics is not why there are two such forms, since we know that in post-verbal position in English, there is considerable freedom of order of constituents, but rather what the difference represents. The answer to this question is that while in isolation both members of pairs like (1) and (2) seem to be equally good sentences, in contexts, it is often the case that one is appropriate while another is not. For example, in response to the question:

2. Who did John give the flowers to?

the following four sentences are potential answers, since they all represent the same basic message (where the underlined words indicate the location of primary sentence stress):

3 a. He gave the flowers to Mary.
   b. He gave Mary the flowers.
   c. He gave the flowers to Mary.
   d. He gave Mary the flowers.

However, only (3a) and (3d) are appropriate answers to (2). The other two forms are quite inappropriate. However, as responses to (4), sentences (3b) and (3d) are appropriate, with the other two quite inappropriate.

4. What did John give to Mary?

In order to account for these facts, it is important to look beyond the boundaries of the sentence. Indeed, the source for the relative appropriateness of such sentences can be found to lie in what has come to be called the GIVEN-NEW strategy (cf. Clark & Haviland, 1974). This strategy deals with the organization of discourse and the effect of context on the form of sentences. The strategy can be formulated roughly as follows:
GIVEN-NEW Strategy. GIVEN information (that known to the speaker but not to the hearer) is systematically separated from NEW information (that known only to the speaker). In English (and in most other languages) GIVEN information normally precedes NEW (order: G-N), but NEW information can precede GIVEN is special devices (such as stress) are used to signal the order N-G.

This strategy has been widely discussed and is of importance for a variety of different syntactic analyses in many different languages. For experimental evidence in support of its viability, see, for example, Clark and Clark (1977), Takahara (1978), Smyth, Prideaux, and Hogan (1979), and Bock and Irwin (1980).

The GIVEN-NEW strategy explains the relative appropriateness of the answers to questions (2) and (4) as follows. In (2), the questioner and the answerer both know that John gave someone some flowers, so that both John and flowers are given. However, the questioner does not know the recipient, though the answerer does. That is, in the appropriate answer Mary must be new. This is precisely the case in (3a) and (3d), but not in the other two sentences. However, in the question (4), it is flowers which must be new, since both participants in the conversation know that John gave Mary something, but both do not know what was given.

The point here is that if we look only at the forms of the sentences, all that can be said is that they differ in form but share the same basic propositional meaning. However, this is to say nothing about the uses of the different forms. At this point, then, we can see how discourse factors interact with the forms of sentences in order to satisfy the appropriateness requirements. That is, we have here a clear instance in which information from the discourse component, represented as a processing strategy, interacts with the grammar component to account for the data. It should also be mentioned that the GIVEN-NEW strategy has found further, widespread success in a variety of situations, as a quick perusal of the references cited above will reveal.

Here, then, is a clear example attesting to the success of the modular approach to language subsystems, and one which nicely illustrates how syntactic form is utilized by speakers and hearers to serve specific purposes, namely to facilitate and structure discourse. In order to do this, of course, the speakers and hearers must share both a knowledge of the relevant syntactic forms of the language and a knowledge of how they are selected and organized in the construction of discourse.

5. The Acquisition of Relative Clauses

English has sentence containing relative clauses (RCs) such as the following, where the underlined clause is a RC:

5 a. The man who brought the flowers greeted the hostess. S+RC V DO
b. The hostess greeted the man who brought the flowers. S V DO+RC
English permits a relative clause to be attached to a noun phrase in virtually any position in a sentence. All appear to be well-attested in the language, although certain relative clause positions and forms are more frequent and natural than others.

In the area of language acquisition, children are known to pass through various stages with respect to their comprehension and production control of various forms in their language. The following four stages characterize the maturational sequence for the acquisition of relative clause structures (cf. Smith, 1970; Limber, 1973; Slobin & Welch, 1973):

Stage 1. The child controls only simple sentences ("Daddy brought flowers.").

Stage 2. The child controls simple sentences plus some conjoined structures ("Mommy brought a flower and Daddy brought some candy.").

Stage 3. The child controls the above, plus some sentences with a relative clause attached to the final NP, but not with an internal, interrupting relative clause ("Mommy chased the dog that scared our cat.").

Stage 4. The child controls the above, plus sentences containing internal, interrupting relative clauses ("The dog that chased our cat was naughty.").

What is to account for this well-documented sequence of stages in the acquisition of relative clauses? If all the structures are acceptable for adults, why does the sequence cited here seem to obtain universally in English and in other languages as well. The answer to this question depends both on the development of cognitive capacities in the child and on general cognitive processing principles. Slobin (1973) has observed that children typically control cognitively simpler structures before more complex ones, and he adduced evidence for this seemingly obvious fact from studies carried out in a variety of languages. This principle of cognitive precedence, which is something like "Easy stuff is mastered before harder stuff," readily accounts for the fact that simple sentences, which typically represent one semantic proposition, are mastered before complex sentences of any kind, which represent two or more propositions.

Thus, Stage 1 should precede the others by the principle of cognitive precedence. Moreover, the same principle seems to support the emergence of conjoined structures before those containing relative clauses since conjoined structures involve a simple linking of notions rather than an embedding which involves the modification of a noun by a full clause.

But why do final relative clauses appear before interrupting ones? The answer to this question resides in a general processing strategy of CLOSURE, which can be formulated as follows:
The CLOSURE strategy. A given unit (clause, phrase, etc.) which is interrupted by another unit is harder to process than a unit which is not interrupted.

CLOSURE, which seems dependent to some large extent on short term memory factors, suggests that the language user attempts to complete a unit he is processing as early as possible. Abundant empirical evidence for CLOSURE has been adduced by Bever (1970), Slobin (1973), Prideaux (1984), and many others. Moreover, the strategy appears to be a very general cognitive information processing principle operative in music, visual perception, and in a host of other cognitive domains.

CLOSURE accounts for the emergence Stage 3 before Stage 4 in an obvious way: Stage 3 permits only non-interrupting relative clauses while Stage 4 contains both interrupting and non-interrupting ones. It is clear that CLOSURE predicts this order since Stage 3 structures are simpler to process, with non-interruption, than those of Stage 4.

Interestingly, CLOSURE is also operative in adult language processing. For example, in text counts based on written and oral language, by far the larger proportion of relative clauses is attached to sentence-final NPs, with relatively few attached to internal NPs. In production data, it has been found that most relative clauses are attached to final NPs (cf. Prideaux, in press; Prideaux & Baker, in press).

In this example the principle of cognitive precedence and the processing strategy of CLOSURE interact with the grammatical structure of the language to account for an otherwise mysterious developmental sequence in the acquisition of English.

6. Conclusions

These two brief examples illustrate nicely the overall success of a research strategy which assumes a modular view of language subsystems. Moreover, these illustrate the emphasis currently being placed on an understanding of those cognitive principles and processing strategies which are so intimately bound up with language processing and acquisition. Obviously, research in psycholinguistics is underway in a wide variety of areas other than those mentioned here. For example, much current research is being devoted to such areas as second language acquisition, language pathology, reading, sign language, sociolinguistics, and a host of other areas.

It should be clear that while for decades and even centuries, linguists have restricted their attention to the sentence itself, it is in only relatively recent times that we have looked beyond the boundaries of the sentence, that is, to discourse and to considerations other than those of the structural properties of sentences themselves. We have over the past several years begun to probe into those areas of general cognition where numerous answers appear to lie concerning language processing. Even though this research is in a relatively early stage, it is clear
that progress is being made.

In summary, not only is psycholinguistics alive, it is also thriving in a myriad of places. The comments offered here can, accordingly, only be seen as having scratched the surface of a vibrant and exciting enterprise.

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Differences in ESL Lexical Boundary Acquisition:  
A Look at L2 English Boundaries of Native German Speakers  
According to Length of Residence in the United States

R. Kirk Belnap
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At the 1983 DLLS Symposium, Graham and Belnap reported a preliminary study investigating the acquisition of English lexical boundaries by native German and Spanish speakers. Their research suggests that there is L1 lexical boundary interference in the learner's L2. This paper is a follow-up study to their research.

The area of semantics and the lexicon has been a sore spot for linguistic science (Weinrich, 1966, p. 53; Labov, 1973, pp. 340-41). Little is know about the relationship of the L1 lexicon to that of the L2 and the effect which the language learner's native lexical boundaries have on his or her L2 lexical boundaries. Still less is known about the effect of time in residence in the L2 environment on the lexicon of the L2; and perhaps least of all is known about the effect of the L2 lexical boundaries, as well as extended residence in that L2 environment on a speaker's L1 lexical boundaries (Haugen, 1969, pp. 467-474).

The Graham and Belnap study (1983b) raised the questions which this paper investigates: 1) Does length of residence in the L2 environment affect L2 lexical boundary acquisition? If so, how? and 2) Does length of residence in the L2 environment affect the L1 lexical boundaries? and if so, how?

Review of the Literature

Graham and Belnap's study (1983b) focused on the referential domain of certain lexical items, such as cup, glass, chair, and stool, which could be represented in line drawings and varied according to height and width. For example, data was gathered to determine at what width a chair becomes a bench in the judgement of native and L2 English speakers. ESL data was collected from native German, Spanish, and Arabic speakers; data was also collected in the native languages of these German, Spanish, and Arabic speakers. The native German, Spanish, and Arabic lexical boundaries were compared with the corresponding ESL boundaries, which in turn were compared with English L1 lexical boundaries in order to determine if the ESL lexical boundaries corresponded to the native English boundaries and if they did not, to determine if L1 lexical boundaries were a source of interference. As mentioned, interference did appear to affect ESL lexical boundaries. Further, it was noted that the native Arabic speakers' ESL lexical boundaries were most like those of the native English speakers; on the average, the Arabic speakers had been in the U.S. longer than either the native German or Spanish speakers. In addition, preliminary analysis suggested that there were differences between the lexical boundaries of those German speakers who had lived in the U.S. over 10 years and those who had lived in the U.S. but a short time.

Other studies, which were reviewed in depth in Graham and Belnap (1983a), include the following: Strick (1980) investigated the
acquisition of American terms of address by Farsi speakers living in the U.S. and found that they retained socio-linguistic elements of their native terms of address in their use of the American terms of address. Kellerman (1977) studied the transferability of concrete and metaphorical uses of a Dutch cognate into English and found that concrete meanings were more transferable.

Nash (1976) investigated the occurrence of positive and negative cognate transfer from Spanish to English. She also illustrated differences between the lexicon of native English speakers and the lexicon of ESL speakers whose native language was Spanish. She pointed out that due to the restricted size of the ESL learner's English vocabulary the learner uses various communicative strategies, such as borrowing terms from the Spanish L1, in order to express him- or herself. She emphasized that "one's native language, materialized in its vocabulary, is a powerful force in all future linguistic experience" (Nash, 1976, p. 165).

Bennion, a presenter in the 1983 DLLS Symposium, discussed the effects of L2 on L1, particularly concerning reading skills. She focused on a review of the literature and on a study she conducted with native English speakers in advanced Spanish classes investigating their reading speed in English. In her review of the literature, she mentioned two types of lexical transfer which Kinzel (1964) reported in his bilingual daughter's speech. The first, "outright transfer" is the direct borrowing of a term from one language into another. The second, "extension" is the use of a term in one language using the lexical boundary of a term in another language. This corresponds to a native English speaker using heiss (hot) instead of scharf (sharp) to refer to a spicy food.

Bennion also cited a study done by Elena Batista-Wallace (1977) which studied the effects of L2 acquisition on the L1 of bilingual children. She found that the L2 was a source of interference in the L1 on the productive level but not on the receptive level.

Ervin-Tripp studied bilinguals' use of color terms and their lexical boundaries and found that the two languages, English and Navaho, interfered with each other (Ervin-Tripp in Dil, 1973).

Hypotheses
None of these studies has looked at the length of residence as a moderator variable affecting L1 or L2 lexical boundaries. From the review of the literature it is evident that there is interlingual interference in the L1 and L2 lexical boundaries. It seems to logically follow that: 1) Length of residence in the L2 environment affects the L2 lexical boundaries of the language learner. 2) Length of residence in the L2 environment affects the L1 boundaries.

Research Design
The primary data which was used in this study came from the Graham and Belnap study (1983b). Subjects were 40 native German speakers and 120 native English speakers all of whom resided in Northern Utah. The German speakers were from the Federal Republic of Germany, the German Democratic Republic, Switzerland, and Austria. Most of the German speakers were undergraduate and graduate students. There was more...
diversity in age, country of origin, and educational background among the native German speakers because there were no large concentrations of them in the area. Data was collected from such a varied population of ESL learners in order to examine the effects of longer residence in the U.S. on the learners' lexical boundaries; a homogeneous group with both shorter and longer residence in the U.S. was not available. The native English speakers were primarily from Utah, Idaho and California; they were all students enrolled in Freshman and Sophomore English classes at BYU.

The instrument in the Graham and Belnap study (1983b), as well as this study was developed by Labov (1973) to investigate denotation by native English speakers. It enables the researcher to isolate lexical boundaries. Subjects were presented line drawings, one after another, of a number of objects which were varied along the height and width dimensions. The subjects chose responses from the multiple-choice answer booklet to refer to the drawings in the picture book and marked their responses on the computer-scored answer sheet. There were 90 items.

Order of presentation of the drawings was varied in the original Graham and Belnap study and was found to have no statistically significant effect on the subjects' responses for all but a few items.

Data were collected in the English L1, in the English L2, and in the German L1. The data was then graphed for each set of items and then the ESL graphs were compared to the native German graphs and to the native English graphs to determine whether the ESL data more closely resembled the native German data or the native English data. If the ESL data was closer to the native German data then the subject had retained his native lexical boundaries for those items. If the ESL data was closer to the native English data then the subject had acquired the native English boundaries for those items.

For the present study, length of residence in the L2 environment was a moderator variable. Therefore, the German data was split up into two groups, those who had lived in the United States for 1 1/2 years or less and those who had lived in the U.S. for over 10 years. The specific lengths of residence were chosen so as to divide the speakers up so that there were as many as possible in each group, still retaining the data pattern characteristics of subjects with shorter and subjects with longer L2 residence. Dr. Cheryl Brown has since brought it to my attention that Olshtain and Blum-Kulka (1983) found that 10 years is the approximate time required for bilinguals to acquire the socio-linguistic rules of the L2. As for group size, Labov found that he obtained reliable data with groups as small as 10. In this study, even with a group as small as 6, subjects patterned together rather closely.

Results and Discussion
Graph Set 1 is an example of where those with longer L2 residence have more nearly acquired the boundaries of a term than those with less residence. In the "10+ years" ESL data, we find that these native German speakers have used the term mug much more than have those native German speakers with only 1 1/2 years residence. Those with 1 1/2 years residence have used mug, but as can be seen this use identically
parallels that of their native Krug boundary. It is not surprising that some of those with less L2 residence have not acquired mug as it is low in frequency.

In Graph Set 2, we find that even though the native German boundaries for Stuhl and Bank correspond almost exactly with the native English boundaries for chair and bench, still 30% of those German speakers with less L2 residence used stool to refer to items which native English speakers referred to as chair. It appears that the phonological similarity between the cognate Stuhl and stool resulted in the negative transfer of L1 boundaries into the L2 English. The three subjects who used stool to refer to the items in set 6 had less than one year of residence in the L2, and two of the three did not live with native English speakers. It also appears that some native German speakers feel that a chair must have arms (perhaps corresponding to their native Sessel), otherwise they call it a stool—in either case it is evidence of interference from the native German.

Increased length of residence does not always result in boundaries which are more like the TL. In Graph Set 3, the ESL lexical boundaries of those with less L2 residence are more like the native English boundaries than are the boundaries of those German speakers with more L2 residence. It is noteworthy that the lexical boundaries of both groups for cup parallel their native Tasse boundaries suggesting native language interference. It is possible that there has been some diachronic change in the use of Tasse in the last 30 or 40 years which would account for the differences in the two groups.

In Graph Set 4, the native German boundaries for Stuhl are not parallel to each other although the two ESL boundaries are. 40% of those with longer L2 residence used Stuhl to refer to items in set 5 which none of those with shorter L2 residence would call a Stuhl. The four who used Stuhl for these items had lived in the U.S. 21 years or more (they were over 41 years old). It is also interesting that these four native German speakers teach German; one is a high school teacher and the other three are university professors. Here again, it is probably the phonological interference of stool with Stuhl which influenced these subjects—but this time the interference was in the other direction, i.e. from L1 to L2. Some of the subjects mentioned they were thinking of a barstool. They used Stuhl (chair) for the semantic content of the phonologically similar stool.

One other item of interest was how long some native German speakers retain their L1 lexical boundaries for Stiefel. In the data for set 5, we find that three of those with over 21 years of residence used Schuh to refer to even the tallest of these items. Unfortunately, two of the three did not complete the ESL portion of the instrument—however, the third carried her lexical boundaries for Stiefel over into her L2; she used shoe for these tallest items, even when they had a vibram-type sole. While collecting the data for this woman's boundaries, I noticed that she had been extremely affected by her 59 years of residence in the U.S. (she was 24 when she immigrated with her husband). Even though most of her other boundaries show some of the most marked interference of all those that were tested, still she had retained her boundary for Stiefel which turned out to be that a Stiefel has no laces. There were
also two people who were between 21 and 25 years old who had the same boundaries for Stiefel.

Instances such as these aroused suspicions as to whether or not the terms which the subjects used in the instrument actually corresponded to their performance model. I probably felt this way because the subjects' boundaries did not correspond to mine and in some instances didn’t seem to correspond to those of other native speakers. My doubts centered on the lexical boundaries of common words such as chair or Stiefel and not on the low-frequency words that a subject might try and guess (though I do not feel there was much of this). After administering the instrument I would quiz the subjects on their boundaries by referring to objects in the room and found that the terms they had used in the instrument did in fact correspond to their productive lexical boundaries.

Summary of Findings

From the above data it does appear that ESL boundaries are affected by length of residence in the L2 environment. Generally, the ESL graphs of those with longer residence in the U.S. more closely paralleled the native English data graphs than did the graphs of those German speakers with less U.S. residence. This was particularly the case with terms which are low in frequency, such as stool and mug.

Frequently, subjects asked what an item was made of or what it was used for. Labov's study (1973) and a pilot study of mine (Belnap, 1982) indicated that composition and context affect denotation considerably. However, data from a neutral context also proved to be valid and reliable.

Naturalistic data is admittedly preferred. However, collecting a sampling of unmonitored language use that could yield lexical boundaries far exceeds time and means constraints. Despite the manner of elicitation, the instrument appeared to be an accurate measure of productive knowledge. A subject's feeling for a word was generally good, though he or she may not have normally felt comfortable in using the term. When the subjects did not feel they knew what to call an item they chose the "none of these" option; this choice was not an uncommon one.

The use of low-frequency words is a problem which is hard to get around—and perhaps undesirable to avoid. The referential world is full of items which are refered to with low-frequency words which the language learner must deal with.

The terms or possible responses which were selected for use in the instrument were taken from the responses of native English speakers for the English instrument and native German speakers for the German. It might have been wise to collect some ESL free response data as well, from which we could have taken possible responses for the multiple-choice answer sheet.

It would also have been valuable to collect German data from native speakers living in Germany, Switzerland and Austria with which to compare the German L1 data of those living in the U.S.. Comparison of lexical boundaries of subjects of similar age and background would be
desirable. This applies to dialect background as well. It appears that in this study we did not have interference from dialects as the terms which were chosen are quite common. More data is needed to be certain.

It would also be interesting after administering the instrument to collect introspective data from native English speakers, native German speakers, and ESL learners on their criteria for calling an item by a given term. Much of what was learned about lexical boundaries came from what subjects said as they were working through the instrument.

From this and other studies which have been conducted it is evident that we cannot assume that language learners automatically adopt the native boundaries of L2 lexical items, whether these are learned in the classroom or in a naturalistic setting. Studies such as these should act as a caution for the teacher to be conscientious in helping students to realize that although language form may be parallel, function does not necessarily follow suite. Lexical items may appear to be equivalent but one to one correspondence of the boundaries of these items should not be assumed. And of course, it follows that as language learners we may need to examine our attitudes and practices in learning vocabulary.


Kinzel, Paul F., "Lexical and Grammatical Interference in the Speech of a Bilingual Child," Studies in Linguistics and Language Learning,


English Native Language
N=133

Cups with handles increasing in height.

Graph Set 1

English as a Second Language
German-speakers with 1½ years of residence
N=10

English as a Second Language
German-speakers with 10+ years of residence
N=6

German Native Language
N=10

German Native Language
N=10
Graph Set 2

Chairs increasing in width.

English as a Second Language
German-speakers with 1 1/2 years of residence
N=10

English Native Language
N=133

German Native Language
N=10
Graph Set 3

Cups without handles increasing in height.

German Native Language

N=10

English as a Second Language

German-speakers with 1½ years of residence

N=10

English as a Second Language

German-speakers with 10+ years of residence

N=6

German Native Language

N=10

German Native Language

N=10
English Native Language

Graph Set 4

Stools increasing in height.

English as a Second Language
German speakers with 1½ years of residence

N=10

German Native Language
N=10

German Native Language
N=10

German Native Language
N=10
Graph Set 5

Shoes with laces increasing in height.
The innocent bystander looking in on the language teaching profession today might suppose that with the present state of the art we have perfected our craft by meticulously sifting through the experience of the past, and that after rigorous research, experimentation and testing we have taken only the best from the proven performance of previous models and culled out less successful ideas and practices.

In fact, as we in the profession all know, that is far from the truth. What advances we may have achieved have not all come about in this way. The major changes in language teaching have come about, I would say, more as a consequence of high-level changes in goals and policies that often ignored essential questions of what the learner, the teacher, the materials and the setting contribute to the language learning process in or out of academia. The notion that we have adequately sifted through the language teaching/language learning experience of the past is a myth. A careful reexamination, a resifting of the experience of the past, can be not only a useful exercise, but may turn up nuggets—if not uncover abandoned mines—from which much profit could be taken.

To be more explicit or more blunt, it is my observation that certain key principles that guided pioneers in the past have, without sufficient examination or reflection, been left behind, and language teaching today is therefore less efficient than it might be.

Much has been written about the programs of language training developed in America as part of the war effort in the '40s. It is acknowledged that the programs pioneered back then have had significant impact on language teaching in the schools and colleges of America ever since.

In this paper I will discuss some language teaching ideas practiced in the '40s by Morris Swadesh, an extraordinary linguist whose contributions to anthropological linguistics are known worldwide, but whose contributions to language pedagogy have been largely overlooked. I will suggest that we should take seriously today some things in language pedagogy that are found in Swadesh's work, but virtually unknown in language teaching since his day.

Since I wish to contrast the war-time experience in language training with some of what was done before and after the war, let me give you a setting in my own pre-war experiences with language study. On the bookshelves of the home where I grew up in Santa Barbara there were numerous textbooks of Spanish, French, Italian, German and Latin, textbooks published mainly in the first four decades of our century. My mother was a high school language teacher, a graduate of Berkeley in Spanish and Italian in the early 20s. In my early years I would occasionally take down some of these lan-

Language Pedagogy: Lessons from the '40s
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language textbooks and glance through them. I found them fascinating. I was
struck with a German text that began: DER WINTER IST KALT. I went through
several lessons on my own, taking a free ride on the cognates. Then a
Spanish textbook caught my eye with its opening volley: EL BURRO ES UN
ANIMAL. Cognates again, offering the reader a free ride. The message to
me: there is some kind of curious relationship among languages. It
shouldn't be hard to learn a foreign language like German or Spanish.
They're like dialects of English.

At La Cumbre Junior High School I got my first taste of a language course.
At the time there were two kinds of Spanish courses offered at the school,
one entitled Conversational Spanish and the other just Spanish. I was
interested in learning to talk Spanish and thought I should enroll in Con­
versational Spanish, but my mother conveyed to me quite emphatically that
(for reasons she did not explain) such a course was not "legitimate." I
don't remember what I had against the other Spanish course, but a compro­
mise was reached and my mother had me enroll at the tender age of 14 in a
Latin class, and managed to coax me into sticking it out two years,
through ninth and tenth grade. My Latin teacher, Miss Hill, was of the
old school—she had been teaching Latin since around the turn of the cen­
tury—so I was initiated into Latin by way of the venerable tradition of
the grammar-translation method. We learned grammar rules by heart:
"Adjectives agree with the nouns they modify in number, case and gender." And as our daily homework was corrected and weekly tests scored, such
rules came to have meaningful consequences. We memorized verb paradigms
until we could recite them by heart: Am-o, am-as, am-at, am-amus, am-atis,
am-ant. Noun paradigms (3 genders, 6 cases, singular and plural numbers,
nominative, genitive, dative, accusative and ablative cases): puell-a,
puell-ae, puell-ae, puell-am, puellae, etc. By constant drill and review
we learned to identify and manipulate the eight parts of speech, to iden­
tify the case forms of nouns and adjectives in all declensions, to ring
changes on verbs and to parse sentences. We puzzled out Latin passages,
translated Latin sentences into English, and performed all the exercises
that go with the method. As someone once put it, we learn that one cannot
decline verbs and conjugate nouns with impunity. Miss Hill was, I would
say, a model teacher, a master of the method, a bearer of tradition at its
best.

There was never any expectation of our learning to speak Latin. That
wasn't the aim. Latin was considered mainly as a linguistic system to be
studied, and the study of Latin as an intellectual exercise that, like the
study of mathematics, would increase our brainpower. But when I thought
about what was in it for me, I figured that even if I stuck it out for
several more years, what I might eventually attain would only be the skill
to read (rather than decipher) Latin literature. And since neither the
content nor the style of Latin literature held out any great attraction
for me at that time, I quit before getting past the slow and painful deci­
pherment stage. But what I brought away from my two years' study of Latin
I now see was not without value: notions of what the structural pieces of
language are like and how they fit together, how complexly language is
structured, respect for the difficulty of language learning, plus notions
of what that kind of language study entails, etc.
In eleventh and twelfth grade I took French. My teacher, Miss Houghton, was a young and beautiful recent graduate of Middlebury College—the famous language school that, even before the war, immersed its students in a "total language experience." Miss Houghton spoke French. And she taught French as a spoken language, a full-blown communication system that was very much alive, not just as a linguistic system related in an odd way to English translation. My experience with French was consequently very different from my experience with Latin. Miss Houghton's course was designed to get us using the spoken language, as well as the written language. She communicated with her students at least partly in French, real French that is, not "la plume de ma tante est dans la jardin de mon oncle." True, I did not acquire fluency in French, even after an hour a day for four semesters, but what I learned from Miss Houghton gave me a very different idea of what a language is, what language study should be, and what it's like to confront a living foreign language. I would say that judged against the standards of our day, Miss Houghton's French class of almost 40 years ago would stand scrutiny, and in most respects, would be seen as a model class. I wonder if French students these days learn any more efficiently or achieve a higher degree of proficiency in the language than we did after two years.

The picture one might deduce from deprecating accounts published much later about language teaching in the schools before the war does not match the reality I remember from Miss Houghton's French class. Because of this I have long suspected that some such accounts substitute a false stereotype or caricature of language teaching in the schools of that period, taking only the worst examples. At any rate, little is said these days in praise of language teaching practices of the pre-war period. It is cast ignominiously onto the dumpheap of ill-founded and outmoded practices.

The modern period of language teaching in America, according to this script, began with World War II. Under great pressures of time an intensive language training program was designed to train selected military personnel in various languages. The strangest or most innovative thing about it was that the privilege of directing the program, formulating its philosophy, designing the training model, developing curriculum and directing its pedagogy was given not to experts in the languages concerned, nor even to specialists in language teaching methodology, but to persons from a very different tradition of esoteric scholarship that traced its brief life only to the turn of the century and the anthropological linguistics of Franz Boaz, Edward Sapir and Leonard Bloomfield.

The men and women trained in this far-out discipline who now, to the great surprise and envy of other language professionals, were called on to work out new and practical modes of language training had had the extraordinary experience of learning and scientifically analyzing exotic languages, but they had had little or no experience in teaching any language. Unencumbered as they were by dogma or tradition, but armed with great confidence in their science, they pioneered new approaches that captured the attention and praise of the American public and exerted influence on language teaching in American schools and colleges.
The phenomenal effort began with Leonard Bloomfield, the dean of American linguists, who in 1942 published the very influential manifesto on language learning, *Outline Guide for the Study of Languages*, and then wrote two model courses (Russian and Dutch), plus a dictionary of spoken Russian. Following him a number of brilliant young men and women, many of them recent graduate students of Sapir's or Bloomfield's, bent their minds to the work of creating the innovative curriculum for intensive language training. Looking back now, the list of names of these wonder-workers reads like a roster of eminent American linguists, though at the time few of them had many publications to recommend them beyond an analytic grammar of an obscure American Indian language or other exotic language. The amazing thing was that, despite the urgency of the situation, many of these young linguistics scholars were assigned to develop courses in languages they had never studied. Charles Hockett, then in his mid-twenties, was put in charge of developing the course in Chinese, though he had never before studied that language. His work had been on Potawatomi, a Central Algonkin language. Mary Haas, barely thirty, but the author of an excellent description of a moribund Indian language of the south, was put on Thai, though she had no knowledge of that language. Norman McQuown, a young Mayanist, was put on Turkish. Morris H. Swadesh was born of Russian-speaking parents in 1909. He did his graduate work in linguistics under Edward Sapir in the early 30s, and married Mary Haas, the linguist assigned to develop the Thai materials. He had never been a language teacher, but he had analyzed Eskimo, Chitimacha, and a group of languages in the Pacific Northwest. He was later to develop his famous glottochronology and do outstanding work on Yana, a language of California, and Maya, Aztec and Tarasco, languages of Mexico. I met him in his home in Mexico in the mid-60s, not long before his death. He was totally bilingual in English and Spanish. During the war he participated in the planning and design level of the intensive language training curriculum, and collaborated with Bloomfield to some extent in developing the Russian course. But on his own he developed two innovative and extremely interesting short handbooks for learners of Chinese and Russian. Though influenced to some extent by the materials designed for intensive instruction, Swadesh's two books were intended for learners who did not have such opportunities.

Today I'll give particular attention to aspects of these two books, *Talking Russian Before You Know It*, a 1945 publication of Henry Holt and Company, now out of print, and *Chinese in Your Pocket*, a 1943 publication of Henry Holt and Company, reissued by Dover Publications in 1964 and still available under the title *Conversational Chinese for Beginners*. In particular I will focus on two guiding principles that are evident in these books. These principles I will call (1) "Take them Where They're At" or "Go from the Known to the Unknown" and (2) "Get Them Talking Before They Know It."

To understand what I mean by these principles, face with me the question that every author of a language course must face. Suppose we were charged with the responsibility of developing materials to help Americans learn to speak and understand exotic languages like Russian and Chinese, what first principles would we begin with?
Let me propose we start out with the first principle above, if we can agree that it is good in principle to take our intended audience where they are, with what mental and cultural equipment we expect them to have, and proceed by juxtaposing the unknown to the known, and where seen helpful to point out a relationship between them. Showing that MAMA and PAPA in English relates to MAMA and PAPA in Russian and MAMA and PAPA in Chinese is an example. The connection is so direct it is not worth spending time teaching these facts. As language learners, all of us are happy to find such correspondences. They connect in immediately.

Of course if everything in a foreign language could connect in as easily as MAMA and PAPA, the teacher's and the learner's task would be much easier. But for a Russian or a Chinese course, we would immediately have to face teaching the foreign matter too. The question we must ask ourselves is then: how can we use this principle? How do we take learners in easy steps from the known to the unknown? And just how far do we want to push this principle? What are we willing to do to relate the unknown to the known?

It seems to me that, despite much lip-service paid in support of the principle it isn't really being exploited much at all—at least not systematically in any published materials I have seen—in teaching the foreign matter. The principle seems often to be forgotten, neglected, or overruled by other considerations. There is no doubt a question of perceived legitimacy here, the means and kind and amount of "facilitation" (as we can call any attempt in instruction to relate the unknown to the known) being limited by what is regarded as legitimate or as conducing ultimately to effective language learning. The question of what initial practices in language training are helpful in the long run in the language learning process is a critical one—possibly the most critical question of all. As has been said many times, serious language learning is a marathon, it is not a sprint, and what may be good practice for the sprinter may not be good at all for the marathon runner. So what is done in the initial phase of language teaching should provide a good foundation as well as motivation for going the whole distance.

As we look very briefly at Swadesh's work we will see that he set out to exploit the principle—almost with a vengeance—with the aim of facilitating formidable parts of the learning process in the early stages of training. What he was after was efficiency, right from the first. He felt that the challenge of learning should not be in overcoming needless learning barriers either by force of brainpower or by costly time investment; the challenge should come in learning significant amounts of useful material efficiently. Swadesh was not one of the method hawkers who dupe the public with "magic" methods that promise "Fluent Russian in Ten Easy Lessons," but he was not afraid to try to cut corners, to simplify, to reduce the learning load even by artificial means.

Well before Swadesh's time there was a widely advocated language teaching approach called the Cognate Method which capitalized on the ease of connecting cognate words, like mama and papa. Of course Swadesh capitalized on cognates where possible. That was no innovation, and to do so fit the principle. He presents them though in small quantities and only to directly serve functions of communication.
But let me give you a clearer picture of some things he did in those books that were more remarkable. In both books he presents the sound system in a novel way, mediating the sounds of Russian and Chinese through the sound system of English. In effect he sets out first to help the learner pronounce English in a Russian or Chinese accent—and with Russian he teaches the foreign alphabet in the process. That approach is, I believe, both novel and of real interest to language teaching theory. At present, Dr. Carl Jacob with his delightful Mariachi Method advocates teaching Spanish pronunciation to American learners through singing in which they acquire Spanish pronunciation habits first by learning to speak English with a thick Spanish accent. This is really the same kind of thing Swadesh did in the '40s, and akin to what James L. Barker promoted as an internationally respected phonetician and professor of Modern Languages many years ago. The fact that this approach to teaching pronunciation was not picked up after the war is no testimony that it isn't a sound and very efficient practice. I can see no good reason to rule it out. Hopefully we will see a Master's thesis this year reporting research on the effects of this radical approach to acquiring a Spanish pronunciation.

Let me show you now some of what Swadesh has in his book Chinese in your Pocket and point out wherein his innovations seem most interesting.

From Unit One, First Session. After presenting the spelling system earlier in the session, he presents some practice reading English written in the Chinese romanization. With familiar English texts, he drives home a profound lesson that can get learners over a major barrier: grasping how the sound system of Chinese is represented by phonemes written in Roman letters. I doubt that a more effective way could be found.

(a) Dau, rai, mi, fa, sau, la, ti, dau.
(b) Wan, tu, tri, far, faiv, siks, savan, sit, nain, tan.
(c) Sim-pal Sai-mon mat a pai-mon,
    Gau-ying tu da far.
    Sad Sim-pal Sai-mon tu da pai-mon,
    Lat mi taist yur war.
    Sad da pai-mon tu sim-pal Sai-mon,
    Lat mi si yur pa-ni.
    Sad Sim-pal Sai-mon tu da pai-mon,
    In-did Ai hav nat a-ni.

From Talking Russian Before You Know It we can see that he carries the principle even farther. Here is one of several exercises in reading English written in Russian letters, to be pronounced with a Russian accent.
Much more in Swadesh's books could be shown to derive from the application of the first principle. In the interest of time I'll leave that and go on to a brief exemplification of the second principle, which is "Get them talking before they know it."

With a modern Comprehension Approach such as that of Postovsky, of Terrell, of Asher, of Winitz, of Nord, of Gary, and others, all of them of considerable interest in the light of current SLA theory, it is supposed that speaking skills need not be taught directly, that they will emerge naturally as the learner exposes himself to situations that invite verbal participation, and as he learns how, verbally and otherwise, to get meaning across and to get and maintain large amounts of comprehensible input in the target language. What he must learn is skills of keeping conversation going even when he does not understand everything, skills of inferencing, guessing, acting interested, conveying to his interlocutors the impression of understanding and participating successfully enough so that they will continue interacting verbally with him. The learner's control of the details of linguistic form in such communicative interaction counts for relatively little. It is not form but meaning that is the focus of communication at this level, and meaning can be conveyed successfully without native-like correctness of form. By using in conversational situations the pieces of language he does control—no matter how far they may be from native speech—the learner will be able to get meaningful feedback in a natural way and make observations and comparisons that can, it is supposed, be of optimal value in improving his communicative competence.

As we are all much aware, most academic language courses stress correctness of form right from the first rather than showing how to communicate
right off at the coping level. The criterion from Day One is native-like speech, hewing to the native model with precision, exactness. That and only that will yield the desired reward: the high grade. Rewards and punishments are contingent on one's approximation to the model.

Notice the difference in Swadesh's very unacademic approach. In its very title Talking Russian before You Know It, which you will note is cleverly ambiguous, he gives away what he is after. It says: Don't wait until you know Russian before you try to talk it; talk it even before you know it! Dive in and don't worry about the form. Just communicate, using whatever will make a Russian understand. Communication will bring its own rewards. You will not be punished for mistakes, as long as you can make communication, that is, get meaning across and receive native speech without utter frustration.

Both his Chinese and his Russian books are built around enabling the learner to engage in a meaningful level of communication from the beginning. The learner is not put under any delusion that his efforts will approximate native language use, but he is led to believe he can generate a lot of meaning with just a little language, that he can find ways to gain maximum purchase with minimum means, engaging in rudimentary communication with natives right from the first. Swadesh tells the learner,

"There is no harm...in speaking less than perfectly at the outset. All learning is by trial and error; that is, you make a stab at the thing, see how you're doing, and then improve on it."

In the Chinese book, Unit One, Second Session, we find seventeen Chinese sentences which, Swadesh proposes, "will get you just about anything you want, provided you use them cleverly and throw in a few gestures."

The seventeen short sentences contain 31 words and exemplify a dozen sentence patterns. Here are the sentences.

1 Okay? (also Hi!) 2 Fine, good. 3 Not good. 4 Go there. 5 Come here. 6 Have a look. 7 What's this? 8 What're you doing? 9 Don't do that. 10 Do this. 11 I want this one. 12 Give me that one. 13 How much money? 14 Where's X? 15 You take me. 16 Thanks. 17 So long.

At this point, with deft strokes the author demonstrates how with these core expressions, their versatile vocabulary and structure, one can generate a very large number of useful meanings. But beyond that, he helps the learner see how to use these expressions and their parts in managing a variety of situations that call for communication. He advises:

Use your head to figure out ways of getting your meaning across with what few words you know. For example, you go to a Chinese mechanic to get your brakes fixed. You say (using phrases you have learned) 'Hi, come here, have a look.' When he comes over, work your brake and say, 'Not O.K..'
If you follow this system you will not only get what you want but you will also be using the same words over and over till they stick with you. In the end you learn the language a lot faster than the man who is always thumbing thru his dictionary to find the exact translation of his thoughts.

Swadesh did not have the advantage of all the research on language acquisition, instructional science, etc. that has been done in the years since the war. Encouraging meaningful production from the beginning would be questioned by Communication Approach hard-liners today. But Swadesh was no more inhibited in this than his contemporaries, or than most of our contemporaries. What Swadesh had was a genius for organizing language instruction for the common learner and an uncommon and daring sense of how to apply certain principles of learning to the task of language teaching. I suggest that we re-examine our own efforts in materials development to see if we could not use Swadesh's principles to the learner's advantage.

I would wager that as we more thoroughly re-examine his work and that of other brilliant, principled, but forgotten "mavericks"—the Pliny Goddards of the past—we will find that we still can learn useful lessons from them.
SUBJECT POSITION IN THE MIDDLE FIELD OF TECHNICAL GERMAN

Larry G. Childs
Weidner Communications Corporation

Erich Drach (4:12) begins his Grundgedanken der deutschen Satzlehre with the thesis that foreigners learning German are confronted with a "confused jumble of incomprehensible rules" for determining word order in a German sentence. To prove his point he then proceeds to list several such rules along with the numerous exceptions for each rule. Included is the following passage on subject position:

'Inversion' is often the case; that is, the subject stands immediately behind the predicate, and another sentence element is placed before it. However the subject can also stand still further back: Hundert Jahre hindurch wuchs um Dornröschen Schlössereine dichte Hecke.

It is precisely when, and under what circumstances that the subject can stand "still further back", i.e. occupy a non-initial position in the middle field, that I wish to explore in this paper. By studying subject position in a small corpus of technical German, I have sought at least the beginnings of answers to the questions: "How often is the subject actually displaced from the initial position of the the middle field?", "What elements can come before the subject?", and "What determines when the subject is displaced?"

The study was limited to technical German partially out of personal interest (I work with this type of material as a translator), and partially because it is an area which has largely been avoided by the more traditional grammarians and linguists, but which may not be as far removed from so-called "standard" German as is commonly assumed, at least in the area of syntax.

"Technical German" is of course a rather general term and can cover a broad range of styles and subject material depending on how it is defined. Not wishing to get bogged down in the fine points of definition, however, I chose a group of texts already labeled as "technical" by the "Institut für Kommunikationsforschung und Phonetik" (7) in their large corpus of written German known as the LIMAS corpus. I chose at random three technical texts from the corpus, each about 2000 words long, whose titles are: "Regelung und Automatisierung von Scherenlinien in Grobblechwalzwerken" (source 88), "Schnelllaufende Rotoren"(source 147), and "Notwendige Spalthöhe"(source 150).

In order to examine subject position, I divided up each clause in the texts according to whether the subject and/or other sentence elements were present in the middle field. I use the term "middle field" here in its present usage as "that portion of the sentence between the conjugated verb or subordinating conjunction and any clause-final verb forms" (Connolly, 2:1). It is actually part of a sentence classification scheme based on verbal "brackets". The position of the conjugated verb or dependent clause introducer is known as the first bracket and the normal position of the verb(s) at or near the end of
the clause is known as the second bracket. These brackets divide the sentence into three "fields", the "forefield", "middle field" and "after field", as is illustrated in figure a). The terminology and examples in figure a) are based on those in the Duden-Grammatik (6:622,623).

Fig. a)

<table>
<thead>
<tr>
<th>Fore-field</th>
<th>First Bracket</th>
<th>Middle Field</th>
<th>Second Bracket</th>
<th>After Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peter hat</td>
<td>seinen Vater im Garten</td>
<td>geholfen.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gestern hat</td>
<td>Peter seinem Vater im Garten</td>
<td>geholfen.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Mann), der</td>
<td>seinen Vater im Garten</td>
<td>geholfen hat.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Each clause was then divided into one of four categories. The first category was for clauses where the subject did not appear in the middle field at all, and the second was for clauses where the subject was in the middle field but was the only element in the middle field. These types of clauses were not investigated further.

The third category was for clauses where the subject appeared as the first element in the middle field and where there were also other middle field elements which could conceivably be placed before the subject. In some instances, it was highly questionable whether the other elements could ever precede the subject, even in extreme cases of stylistic emphasis, e.g. placing the reflexive pronoun sich before a subject consisting of es or man. However in order to avoid making a prejudgement about which elements could be permuted, these questionable sentences were by and large left in this category.

Finally, the fourth category was for clauses where the subject appeared in the middle field, but in non-initial position, i.e. there was at least one element between the first bracket and the subject. This category of course formed the bulk of material for the study.

Each of the clauses in the four categories was also labeled as to whether it was an independent clause (I), subordinate clause (S), or relative clause (R). Independent clauses are those where the the conjugated verb is in the second position in the sentence (or first position in some interrogatives). Subordinate clauses are those with dependent word order, i.e. the conjugated verb is at or near the end of the clause, and the clause is introduced by a subordinating element such as a subordinating conjunction. Relative clauses are identical to other subordinate clauses except that they are introduced by a relative pronoun. They were counted separately from other subordinate clauses because the relative pronoun, which is very often the subject, occupies the position of the the first bracket, and therefore the subject is often not in the middle field at all. Figure b) gives an overview of the numbers of each type of clause in each text.

Fig. b)

<table>
<thead>
<tr>
<th>TEXT A</th>
<th>TEXT B</th>
<th>TEXT C</th>
<th>TOTALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>I 57</td>
<td>45</td>
<td>59</td>
<td>161</td>
</tr>
</tbody>
</table>
A few conclusions can be drawn immediately from these figures, which indicate the general trend for this type of text, even though the corpus size is really too small for any valid detailed statistical analysis. First of all, out of the total number of clauses, approximately 59% of them have the subject in the middle field. In other words, having the subject in the middle field is a fairly common phenomenon, happening at least half of the time. As to one of the main questions of the study, i.e. "How often is the subject in non-initial position when it is in the middle field?", the answer is about 27% or one quarter of the time.

Figure c) shows what types of words and phrases actually came before the subject and how often. It also shows how often the same elements occurred after the middle field subject in other clauses of the same text. No attempt was made to categorize these words and phrases into anything more than the most basic sentence element classes, i.e. objects, prepositional phrases and adverbs, and even these were listed by individual tokens. This was done in order to avoid any preconceived notions about what constitutes a generalized sentence element, since among different linguists there are several classification systems of varying generality.
### Fig. c)

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>BEFORE</th>
<th>AFTER</th>
<th>ELEMENT</th>
<th>BEFORE</th>
<th>AFTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>(OBJECTS)</td>
<td></td>
<td></td>
<td>WAHRENDE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SICH</td>
<td>A 4</td>
<td>-</td>
<td>B 1</td>
<td>C 6</td>
<td>6</td>
</tr>
<tr>
<td>DAT. OBJ.</td>
<td>A 1</td>
<td>1</td>
<td>B -</td>
<td>C -</td>
<td></td>
</tr>
<tr>
<td>(ADVERBS)</td>
<td></td>
<td></td>
<td>(UN)ABHÄNGIG</td>
<td>A 2</td>
<td>-</td>
</tr>
<tr>
<td>DURCH</td>
<td>A -</td>
<td>-</td>
<td>B -</td>
<td>C 2</td>
<td></td>
</tr>
<tr>
<td>FÜR</td>
<td>A 4</td>
<td>1</td>
<td>B 1</td>
<td>C -</td>
<td></td>
</tr>
<tr>
<td>GEGENÜBER</td>
<td>-</td>
<td>-</td>
<td>B -</td>
<td>C -</td>
<td></td>
</tr>
<tr>
<td>IN</td>
<td>A -</td>
<td>-</td>
<td>B -</td>
<td>C -</td>
<td></td>
</tr>
<tr>
<td>MIT</td>
<td>A -</td>
<td>-</td>
<td>B -</td>
<td>C -</td>
<td></td>
</tr>
<tr>
<td>NACH</td>
<td>A 3</td>
<td>-</td>
<td>B -</td>
<td>C 1</td>
<td>1</td>
</tr>
<tr>
<td>OHNE</td>
<td>A -</td>
<td>-</td>
<td>B -</td>
<td>C -</td>
<td></td>
</tr>
<tr>
<td>STATT</td>
<td>A -</td>
<td>-</td>
<td>B -</td>
<td>C 1</td>
<td>1</td>
</tr>
<tr>
<td>VOR</td>
<td>A 1</td>
<td>1</td>
<td>B -</td>
<td>C -</td>
<td></td>
</tr>
</tbody>
</table>

### (PREPOSITIONAL PHRASES)

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>BEFORE</th>
<th>AFTER</th>
<th>ELEMENT</th>
<th>BEFORE</th>
<th>AFTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALLEIN</td>
<td>A -</td>
<td>-</td>
<td>B -</td>
<td>C -</td>
<td></td>
</tr>
<tr>
<td>DURCH</td>
<td>A -</td>
<td>-</td>
<td>B 2</td>
<td>C 1</td>
<td></td>
</tr>
<tr>
<td>FÜR</td>
<td>A 4</td>
<td>1</td>
<td>B -</td>
<td>C 1</td>
<td>1</td>
</tr>
<tr>
<td>GEGENÜBER</td>
<td>-</td>
<td>-</td>
<td>B -</td>
<td>C -</td>
<td></td>
</tr>
<tr>
<td>IN</td>
<td>A -</td>
<td>-</td>
<td>B -</td>
<td>C -</td>
<td></td>
</tr>
<tr>
<td>MIT</td>
<td>A -</td>
<td>-</td>
<td>B -</td>
<td>C -</td>
<td></td>
</tr>
<tr>
<td>NACH</td>
<td>A 3</td>
<td>-</td>
<td>B -</td>
<td>C 1</td>
<td>1</td>
</tr>
<tr>
<td>OHNE</td>
<td>A -</td>
<td>-</td>
<td>B -</td>
<td>C -</td>
<td></td>
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<tr>
<td>STATT</td>
<td>A -</td>
<td>-</td>
<td>B -</td>
<td>C 1</td>
<td>1</td>
</tr>
<tr>
<td>VOR</td>
<td>A 1</td>
<td>1</td>
<td>B -</td>
<td>C -</td>
<td></td>
</tr>
</tbody>
</table>

### (UN)ABHÄNGIG  

| A 2 | - |  |
| --- |  |  |
| B - | - |  |
| C - |       |
One thing that is immediately evident from figure c) is that a good many different words and phrases (22 in all) actually occurred at one time or another before the subject in the middle field. It is also evident that many of these words (including all of the adverbs) occurred only once or twice in the whole text, thus making it impossible to make any predictions about whether they typically precede the subject.

However, a few prepositional phrases occurred frequently enough to begin to make some generalizations about them, although few if any really clear cut patterns emerged. Durch and in, for example, seem to occur only atypically before the subject, whereas für preceded the subject in five out of seven instances.

Prepositional phrases with bei, on the other hand, were almost equally positioned before and after the subject (15 occurrences before and 14 after). Bei was also by far the most common element to appear before the subject, making up nearly one quarter (24%) of the total occurrences of elements appearing before the subject. Bei before the subject also occurred significantly more often in subordinate clauses than in any other type (12 times in subordinate, 3 times in independent and not at all in relative clauses). The distribution of the other elements throughout the three types of clauses seemed fairly random.

The reflexive pronoun sich (there were no instances of the first person reflexive) also occurred fairly frequently in the texts (21 times) and occurred exactly twice as often before the subject (14) as after it (7). Also, in six of the seven instances where sich followed the subject, the subject was es or man. The subject was never es or man when sich preceded it. This indicates a very strong tendency for the reflexive pronoun to be placed at the beginning of the middle field unless the subject is also a pronoun. And, indeed, pronominial subjects were never preceded by any other elements.

To answer the final question, "What determines the displacement of the subject?", I have turned to various existing theories of word order for an answer. All of the linguistic works that I consulted dealt exclusively with "standard" German as is evident from the examples given in those works, and as has been specifically stated, at least by Ulrich Engel. Thus, consulting these works also gives a way to compare the technical German of the corpus with standard German.

Some linguists, such as James Marchand (8) and Ulrich Engel (5) have approached the problem of syntax by constructing a "basic sequence" for the order of the elements in a German sentence and then go into varying detail to explain deviations from this order in actual sentences. Engel has probably the most detailed theory with a basic sequence for the middle field which contains 24 slots for different sentence elements. Eleven of these slots are for Ergänzungen, roughly objects and other elements that can be said to be governed by the verb. Of particular interest are the three slots for different types of subjects: the pronominal subject, the "definite" subject, generally
introduced by a definite article, and the "indefinite" subject, generally introduced by an indefinite article or no article at all. The other thirteen slots are for various classes of adverbial-type elements known as, Angaben, which are not valence dependent but can occur in virtually any sentence.

Engel's basic sequence has the pronominal and the definite subjects coming before any adverbials at all, and the indefinite subject placed after all adverbial elements except negative and modifying adverbials. Pronominal objects come before the definite subject but after the pronominal subject, which accurately predicts the position of the reflexive pronoun object sich as well as pronominal subjects in the corpus.

A comparison of the results of this study with the order of adverbials postulated by Engel shows numerous exceptions, however. There were one or two indefinite subjects which were preceded by expected adverbials, but the rest of the instances of subject displacement, nearly 25% of all the occurrences of the subject in the middle field, were at variance with the basic sequence.

Engel expects variation, although he never says how much is to be expected, and is leery of frequency counts. (Marchand, with a similar, but somewhat simpler basic sequence designed for pedagogical purposes claims 95% accuracy with his.) Engel accounts for the variations by appealing to the principle that elements of greater "informational value" (Mitteilungswert) tend to be placed towards the end of the middle field, and that in the case of adverbials, elements on the left predicate (or determine) elements on the right. In fact, he claims that his basic sequence has the order it does because, in general, elements on the right in the sequence have greater informational value than elements on the left.

These latter rules are remarkably similar to those of other, particularly earlier, linguists who attempted to account for the syntax of the German sentence without placing such a detailed emphasis on a "basic sequence". While each enumerated different influences, they all agreed on certain basic principles. George Curme (3), for example, speaks of subjects which are "heavy", "prominent", and/or "emphasized" coming after "weak" and "light" and "unimportant" words.

Otto Behagel (1) posits a "powerful law" which states that the "important comes later than the unimportant" as well as another law which says in effect that elements on the left determine or "differentiate" elements on the right. He also claims that word order is also influenced by the "the law of growing members" ("Gesetz der wachsenden Glieder"), a law which he discovered and which says that where possible, the shorter member come before the longer one. There were however numerous exceptions to this rule in the corpus studied, e.g. "dah\mbox{\text{"}} anders als bei A. Stodola, selbst bei vorhandener ä\mbox{\text{"}}rzer und fehlender innerer Dämpfung unabhängig von der Größe der Drehmasse oberhalb der Resonanz Instabilität und (selbst bei fehlender Drehmasse) Stabilität auftreten kann."
Finally, Erich Drach (4) expresses the idea that the less important comes before the more important more strongly and in more detail than almost anyone. He maintains that any attempt to predict the word order of a German sentence on the basis of grammatical function (dative object before accusative, etc.) will be plagued with exceptions and lead to insoluble contradictions. To him the relative relationship between the elements is the deciding factor. The primary influence on the order of the middle field is, according to Drach, that the "Sinnwort", the semantic key element, is placed as close as possible to the end. That is naturally the most important spot because it is the "last-heard" word that makes the deepest impression and stays with the listener the longest.

The study shows, that while the basic sequence of Engel is right most of the time, German word order is far from fixed and there is frequent, significant deviation from his or any other basic sequence. Engel’s sequence is an accurate predictor of middle field pronoun position, for example, but is unable to account satisfactorily for the position of many adverbials, including bei phrases which occur just as often before the subject as in their predicted spot after it. Even Engel, when writing about the middle field, uses bei before the subject.

I feel, that while there are several major influences on middle field position, these general principles which all the linguists held in common are indeed the overriding factor. The less important elements do tend to come first. Most of the words and phrases which preceded the subject in the corpus seemed to be "setting the stage", delimiting the situation by giving the background information in preparation for the really important message, the new information of the sentence, which was contained in the subject.

This principle is perhaps the best way to explain many subtle variations in word order, such as why the prepositional phrases with "bei" are in different positions relative to the subject in the following two clauses both taken from text C: "daß bei besserer Filtrierung des Öles kleine Spalthöhen zugelassen werden kann" and "daß der Schwerpunkt des Druckfeldes bei steigender Neigung nach hinten wandert". In the first clause, it could be postulated that the author's main intention was to convey a message about the the subject, "kleine Spalthöhen", under certain conditions, whereas in the second clause it is the condition itself that was uppermost in his mind.

In summary then, the displacement of the subject from the first position in the middle field of technical German is fairly common. The subject appears in the middle field about half the time, and is displaced in about a quarter of those instances. In other words, subject displacement occurs in about one out of every eight clauses. There are many different words and phrases which can come before the subject in these cases, and the real key to deciding what elements come before seems to be a semantic one. Finally, a comparison of subject position in this small corpus with some traditional grammatical works shows that the principles governing the word order of technical German are essentially the same as those of standard German.
REFERENCES


Why is it that almost every language in the world prefers dental consonants over labials and velars (Greenberg 1966a:56-57; Jakobson 1968:53, 87), but Samoan prefers labials and velars over dentals?

Why is it that almost every language in the world prefers stop consonants over fricatives (Jakobson 1968:51-52), but Samoan prefers fricatives over stops?

We cannot ignore the Samoan sound system; it challenges our linguistic theories and methodologies. I shall try to show that Samoan's apparent violations of language universals regarding consonants are related to the vocalic/consonantal opposition, which is different in Samoan than in many languages.

**LANGUAGE UNIVERSALS**

The first step in developing notions of language universals is the observation of universal occurrences in languages. In the realm of language sounds (as opposed to grammar, syntax, lexicon, etc.), the kinds of occurrences that are observed include (1) distinctive feature oppositions, (2) phonemes (which are bundles of distinctive features), and (3) prosodic phenomena. Among the distinctive feature oppositions vocalic/consonantal, compact/diffuse, and grave/acute are universal, while nasal/non-nasal and abrupt/continuant are nearly universal in consonant systems and voiced/voiceless is extremely common in consonant systems. (Greenberg 1966a:26-27, 56, 265-66; Jakobson 1971:492, 655; Jakobson & Waugh 1979:110, 132) Examples of particular phonemes that are universal include the vowel /a/ and a dental stop consonant. (Jakobson 1971:493-94; Jakobson & Waugh 1979:110, 125-29) The presence and absence of phonemes with relation to each other is particularly noteworthy. E.g. languages do not have a velar nasal unless they also have a velar stop (Greenberg 1966a:57; Hockett 1955:119), but there are languages with velar stops that have no velar nasal.

From this latter relational kind of observation linguists infer implications of irreversible solidarity. (Greenberg 1966a:56; Greenberg 1966b:21; Greenberg 1966c:513-515; Jakobson 1968:51-57; Jakobson 1971:526; Jakobson & Waugh 1979:56, 123, 154-65) E.g. no language makes a phonemic distinction in the nasals unless it also makes that distinction in the stops, no language makes a phonemic distinction in the labial or velar series of consonants unless it makes that distinction in the dental series (Jakobson & Waugh 1979:139), and no language makes a phonemic distinction in the fricatives unless it makes that distinction in the stops. (Jakobson & Waugh 1979:140-41)

From the universality of the /a/ vowel and the dental stop consonant linguists infer the principle of opposition maximization. The reasoning goes like this: The optimal vowel is /a/. Its features are vocalic, continuant, compact, grave, voiced. The optimal consonant is the dental stop. Its features are consonantal, abrupt, diffuse, acute,
These two phonemes are as different from each other as two phonemes can get. They are maximally opposed, presumably to enhance understandability and hence communication. (Greenberg 1966a:266; Jakobson 1971:491-93; Jakobson & Waugh 1979:109, 135, 140)

OVERVIEW OF SAMOAAN LINGUISTICS

The study of the Samoan language has not had a long, fruitful, refining history comparable to the study of Indo-European languages. The first Europeans to settle in Samoa didn't get there until barely two centuries ago. The first reports on the Samoan language came out in the mid-1800s (e.g. Hale 1846). Gabelentz in 1891 and Churchill in 1908 made astute observations, some of which we will note below. The few studies that have been done on the Samoan speech sounds since World War II have been cursory, missing the theoretical challenges presented by the complexity of this sound system with a deceptively small phoneme inventory. (Arakin 1973:14-15; Kernan 1974:107; Krupa 1970:78-79; Krupa 1973:52-55; Krupa 1982:24-25; Pawley 1960; Voegelin & Voegelin 1964: (No.7):9-10) Jakobson and Waugh noted the unusualness of the Samoan preference for the velar over the dental stop but did not work on the problem beyond that. (Jakobson 1968:53-54; Jakobson & Waugh 1979:127-29) There has not been yet published a serious, thorough distinctive feature analysis of Samoan. My first task here will be to provide that distinctive feature analysis, for to analyze any particular aspect of Samoan speech sounds we must see how they all fit together in the Samoan speech sound system.

Scholars trace the Polynesian languages, including Samoan, back to a parent language that they call "Proto-Polynesian." There is general agreement on the phoneme inventory of Proto-Polynesian. (Biggs 1971:480; Churchill 1908:151; Elbert 1953:154; Krupa 1982:15; Schuhmacher 1973:687) And there have been some helpful comparative Polynesian studies in the twentieth century. (Biggs 1971; Churchill 1908 & 1911; Elbert 1953; Krupa 1970, 1973, & 1982; Voegelin & Voegelin 1964)

PROTO-POLYNESIAN SOUND SYSTEM (ACOUSTIC FEATURES)

<table>
<thead>
<tr>
<th>CONSONANTAL</th>
<th>diffuse</th>
<th>grave</th>
<th>acute</th>
<th>compact</th>
</tr>
</thead>
<tbody>
<tr>
<td>nasal</td>
<td>m</td>
<td>n</td>
<td>ng</td>
<td></td>
</tr>
<tr>
<td>non-nasal</td>
<td>p</td>
<td>t</td>
<td>k</td>
<td>?</td>
</tr>
<tr>
<td>abrupt</td>
<td>s</td>
<td></td>
<td>h</td>
<td></td>
</tr>
<tr>
<td>continuant</td>
<td>f</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>voiceless</td>
<td>v</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CONSONANTAL AND VOCALIC

<table>
<thead>
<tr>
<th>diffused and compact</th>
<th>acute</th>
<th>grave</th>
</tr>
</thead>
<tbody>
<tr>
<td>diffuse</td>
<td>i</td>
<td>u</td>
</tr>
<tr>
<td>compact</td>
<td>e o</td>
<td></td>
</tr>
</tbody>
</table>

VOCALIC
PROTO-POLYNESIAN SOUND SYSTEM (ARTICULATORY FEATURES)

<table>
<thead>
<tr>
<th>CONSONANTS</th>
<th>labial</th>
<th>dental</th>
<th>velar</th>
<th>glottal</th>
</tr>
</thead>
<tbody>
<tr>
<td>nasal</td>
<td>m</td>
<td>n</td>
<td>ng</td>
<td></td>
</tr>
<tr>
<td>oral</td>
<td>p</td>
<td>t</td>
<td>k</td>
<td>?</td>
</tr>
</tbody>
</table>

| ARTICULATORY FEATURES | | | |
|------------------------| | | |
| stops                  | p      | t      | k     | ?       |
| fricatives             | f      | s      | h     |         |
| voiceless              | f      | s      | h     |         |
| voiced                 | v      |        |       |         |
| liquids                | l      | r      |       |         |
| lateral                | l      | r      |       |         |
| non-lateral            | m      | n      | ng    |         |

| VOWELS | | |
|--------| | |
| front  | | |
| back   | | |
| high   | | |
| mid    | i | e | a |
| low    | u | o | a |


PURPORTED CLASSICAL SAMOAN SOUND SYSTEM (ACOUSTIC FEATURES)

<table>
<thead>
<tr>
<th>CONSONANTAL</th>
<th>diffuse</th>
<th>acute</th>
<th>compact</th>
</tr>
</thead>
<tbody>
<tr>
<td>nasal</td>
<td>m</td>
<td>n</td>
<td>ng</td>
</tr>
<tr>
<td>non-nasal</td>
<td>p</td>
<td>t</td>
<td>?</td>
</tr>
</tbody>
</table>

| CONSONANTAL AND VOCALIC | | |
|-------------------------| | |
| diffuse and compact     | e | o | | |
| compact                 | a | | | |

| voc | | |
|------| | |
| acute | grave | i | u | | |
PURPORTED CLASSICAL SAMOAN SOUND SYSTEM (ARTICULATORY FEATURES)

CONSONANTS

<table>
<thead>
<tr>
<th>nasal</th>
<th>labial</th>
<th>dental</th>
<th>velar</th>
<th>glottal</th>
</tr>
</thead>
<tbody>
<tr>
<td>oral</td>
<td>m</td>
<td>n</td>
<td>ng</td>
<td>?</td>
</tr>
</tbody>
</table>

stops    p  t  ?
fricatives s
voiceless f
voiced   v
liquid   l

VOWELS

<table>
<thead>
<tr>
<th>high</th>
<th>front back</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>i</td>
</tr>
<tr>
<td>mid</td>
<td>e</td>
</tr>
<tr>
<td></td>
<td>o</td>
</tr>
<tr>
<td>low</td>
<td>a</td>
</tr>
</tbody>
</table>

A major problem with this purported classical Samoan sound system is that it violates the language universal of no distinction in the nasals unless it is also in the stops. (Greenberg 1966a:57; Hockett 1955:119) The only reported exception to this universal is reported by Hockett: Samoan! (Hockett 1955:119) Except Hale in 1846, every reporter has acknowledged the sounds /n/, /ng/, /t/, /k/ in Samoan, notwithstanding their protestations that /k/ was vulgar and foreign. We don't have any evidence of /ng/ without /k/ except for the claim of Pratt and prescriptive natives and dictionary/primer writers that "pure" Samoan had only /t/ and no /k/. While Samoan today spoken under certain conditions may eliminate /k/, every Samoan speaker has /k/ as part of his or her sound system. From the overwhelming evidence about languages existing today, linguists should be skeptical about reports that the Samoan sound system existed for long with /ng/ but no /k/. If /k/ completely disappeared from Samoan for a time, why did /ng/ remain? (And why are the nasals so permanent in the Polynesian languages? (cf. Krupa 1982:16)) There is little doubt that /k/ in Samoan does not have the same function as /k/ in Proto-Polynesian had. In Proto-Polynesian, by all accounts, /t/ and /k/ were distinct phonemes, while in Samoan, as far as we can tell, /t/ and /k/ have always been in allophonic variation. This contextual variation is not conditioned by the phonic environment of /t/ or /k/ but by the social environment of the speakers. Perhaps we should call it "allosocial variation."

From that purported classical Samoan system, some claim that Samoan has undergone a process of "backing" that all the missionaries, educators, and printing presses in Samoa have been unable to halt. (Gabelentz 1891:201; Hockett 1955:119; Keesing 1932:307; Krupa 1973:53; Milner 1966:xiv-xvi; Pawley 1960:47; Schuhmacher 1973) Some even claim that the Samoan speech sound system may eventually completely change into a system like this:
This projection of Samoan has a major problem. There are no known
languages that have labial and velar nasals and stops but no dental
nasals and stops. Could Samoan possibly lose its dentals all together?
And why keep its dental fricative and lose its dental stop?

The two systems represented above (purported classical and future
Samoan) do not represent the spoken Samoan of today. Spoken Samoan
today has a sound system like this:
When Samoan is spoken in contexts in which the speakers wish to draw attention to the social status of the participants or the occasion or both (often referred to in the literature as "formal" contexts), then /t/ and /k/ are used as distinct phonemes and /k/ only shows up in a few foreignisms. Likewise /n/ and /ng/ are distinct phonemes, though /ng/ is a native, not foreign, sound. Otherwise (i.e. in "informal" contexts) /t/ and /k/ are used as if they were allophones and [k] is the predominant, almost exclusive, allophonic variant. Similarly /n/ and /ng/ are used as allophones, with the latter the almost exclusive variant. Thus, in an informal family setting one is likely to hear many instances of [k] and almost none of [t], many [ng] and few [n]. Contrariwise, in formal ceremonial settings one is likely to hear fewer [k] than [t] and to hear both [n] and [ng]. /t/ and /n/ are also generally used in singing and in speaking with foreigners. It is reported that in some "formal" settings one Samoan will deliberately use /t/ and /n/ while his interlocutor deliberately uses /k/ and /ng/. (Buse 1961: 46)
It has been suggested that when a Samoan uses /t/ and /n/ he is signalling that his interlocutor is not in the "in-group" and the context makes clear which "in-group" is referred to. In circumstances where "in-group" specification is not necessary or desirable /k/ and /ng/ are used.

**HYPOTHESIS**

It's not so strange that dentals and velars are in contextual variation. The question is why the velars are the preferred variants. My thesis is that the vocalic/consonantal opposition in Samoan is somehow different than it is in many Indo-European languages and that in Samoan consonants are preferred which enhance vocalism. I will discuss what I think is evidence that supports this idea that the vocalic/consonantal opposition is different. The evidence includes comparative phoneme frequency studies, comparative cerebral dominance studies, and comparative observations of the functions of vowels and consonants in Samoan and in Indo-European languages. I will then discuss what relation this has to Samoan's labial-velar-fricative preference. I will conclude by pointing out areas for further work to test this hypothesis.

**PHONEME FREQUENCY STUDIES**

In Samoan the percent of occurrences of vowels and consonants is about 61 percent vowels and 39 percent consonants. I did a phoneme frequency count on a corpus of some 52,800 phonemes, about 20 printed pages, taken from S. Masterman, *An Outline of Samoan History* at 1-20 (1980) and *The Samoa Times*, Vol. XVI, No. 26, at 8-10, July 1, 1983, both written by native Samoans.

<table>
<thead>
<tr>
<th>PHONEME</th>
<th>#</th>
<th>%</th>
<th>PHONEME</th>
<th>#</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>14,036</td>
<td>26.6</td>
<td>1</td>
<td>4,221</td>
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</tr>
<tr>
<td>i</td>
<td>6,180</td>
<td>11.7</td>
<td>t/k</td>
<td>3,789</td>
<td>7.2</td>
</tr>
<tr>
<td>e</td>
<td>4,782</td>
<td>9.1</td>
<td>n/ng</td>
<td>3,370</td>
<td>6.4</td>
</tr>
<tr>
<td>o</td>
<td>4,701</td>
<td>8.9</td>
<td>m</td>
<td>2,531</td>
<td>4.8</td>
</tr>
<tr>
<td>u</td>
<td>3,620</td>
<td>6.8</td>
<td>s</td>
<td>1,800</td>
<td>3.4</td>
</tr>
<tr>
<td>p</td>
<td>1,710</td>
<td>3.2</td>
<td>f</td>
<td>761</td>
<td>1.4</td>
</tr>
<tr>
<td>v</td>
<td>657</td>
<td>1.2</td>
<td>14</td>
<td>148</td>
<td>0.3</td>
</tr>
<tr>
<td>h</td>
<td>42</td>
<td>0.1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

VOWELS 33,319 63.1
CONSONANTS 19,497 36.9

To compare with my results based on written Samoan, I did a count on a corpus of some 6,800 phonemes, from Buse 1961:106-14, and Duranti 1983: 5-15, which were recordings of Samoan ceremonial speeches transcribed by *papalagi* (non-natives of Samoa).
The phoneme frequencies in Buse's and Duranti's transcriptions differ considerably in the case of the glottal stop. Baird's figure for the glottal stop (below) is in between Buse's and Duranti's. Maybe this disparity results in part from the transcriber's difficulty in distinguishing when he or she is hearing the phoneme glottal stop from when he or she is hearing a non-phonemic glottal catch. (Cf. Milner 1966: xviii) As to the small size of this Buse/Duranti corpus, in terms of giving reliable results, Greenberg was willing to draw significant linguistic conclusions from frequency counts on phoneme corpuses of only 1000 phonemes (Greenberg 1966b:15) and Kramsky considered corpuses between 326 and 836 words (2000 to 8000 phonemes) to be "sufficient ... to warrant a relative stability of statistical results." (Kramsky 1966:134)

I have been fortunate to receive from Dr. Rey L. Baird of the BYU Linguistics Department a copy of an unpublished study on Samoan phoneme frequencies he conducted during his graduate linguistics program at Indiana University at Bloomington. The size of the corpus and whether the source was written or spoken Samoan is unknown.

<table>
<thead>
<tr>
<th>PHONEME</th>
<th>#</th>
<th>%</th>
<th>PHONEME</th>
<th>#</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
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<td>24.8</td>
<td>l</td>
<td>508</td>
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</tr>
<tr>
<td>o</td>
<td>430</td>
<td>9.1</td>
<td>?</td>
<td>216</td>
<td>10.4</td>
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<tr>
<td>u</td>
<td>450</td>
<td>9.5</td>
<td>t</td>
<td>180</td>
<td>8.7</td>
</tr>
<tr>
<td>e</td>
<td>410</td>
<td>8.7</td>
<td>f</td>
<td>192</td>
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</tr>
<tr>
<td>i</td>
<td>400</td>
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<td>s</td>
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<td>l</td>
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<td>m</td>
<td>183</td>
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<td>m</td>
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<td>45</td>
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<tr>
<td>f</td>
<td>150</td>
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<td>29</td>
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<tr>
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<td>90</td>
<td>1.9</td>
<td>s</td>
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<td>u</td>
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<td>VOWELS</td>
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<table>
<thead>
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<tr>
<td>l</td>
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<td>?</td>
<td>6.32</td>
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<td>t</td>
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<td>f</td>
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<tr>
<td>m</td>
<td>3.66</td>
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<tr>
<td>n</td>
<td>3.64</td>
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<tr>
<td>s</td>
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<tr>
<td>ng</td>
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<td>1.14</td>
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</table>

<table>
<thead>
<tr>
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<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONSONANTS</td>
<td>38.88</td>
</tr>
</tbody>
</table>
Considering that in my count on written Samoan the glottal stop is underrepresented, my percentages of 63.1 and 36.9 would probably be closer to Buse and Duranti's 61.0 and 39.0 and Baird's 61.1 and 38.9 if the glottal stops were fully represented. It looks like the percent of occurrence of vowels and consonants in spoken Samoan converges on 61 percent for vowels and 39 percent for consonants. The English frequencies are the reverse: vowels 37 percent and consonants 63 percent. Japanese, more like Samoan in this regard, has percentages of 51.5 for vowels and 48.5 for consonants. I'm not the first to note the difference in the relative percent of occurrences of vowels and consonants. As early as 1862 an observer noted that "[t]he Polynesian language... abounds in vowels, the proportion of these to consonants being twice or thrice that of the average of other languages." (Rae 1862:328) I interpret the great difference in relative frequency of vowels and consonants in English and Samoan as evidence that the relationship between vowels and consonants are different in the two languages.

CEREBRAL DOMINANCE STUDIES

Over the past twenty years there has been a considerable amount of study of lateralization between the hemispheres of the cerebrum and it has been generally found that the processing of linguistic sounds takes place primarily in the left hemisphere of right-handed persons while the processing of non-linguistic sounds is mainly right-hemispheric. (Jakobson 1960; Shimizu 1975:13) During the 1970s linguists announced studies that showed a major difference between vowel recognition of Japanese and Polynesians and that of Westerners. (Shimizu; Sibatani; Tsunoda; Note 1975; Note 1982) It seems that for Westerners steady-state vowels are recognized in the right hemisphere and consonants in the left, but for Japanese and Polynesians recognition of both consonants and vowels takes place in the left hemisphere.

From these observations, one experimenter, Tadanobu Tsunoda, concludes that "the weight of vowel sounds in speech recognition is greater for Japanese than for West-European languages. From the standpoint of the articulatory reference theory (Liberman et al., 1967), the perception of the vowel sounds for West European [subjects] is distinctively different from the stop consonants, i.e. the latter is categorical while the former is continuous. In contrast to this theory, Japanese vowels may have to be considered to be categorically perceived in the dominant hemisphere just like stop consonants." (Tsunoda 1971:311) Another experimenter, Katsumasa Shimizu, suggests that these findings "may indicate that vowels in Japanese are linguistically more significant to Japanese subjects than vowels in English to English subjects. One of the reasons for linguistic significance of vowels is that there are some monosyllabic words consisting of a single vowel which have semantic referents in Japanese. For instance, [a] means 'mute', (Note 1975:8) /i/ means 'stomach', /e/ 'picture', /u/ 'cormorant' and /o/ 'tail'. That is, Japanese subjects perceive vowels in connection with easily accessible semantic referents and linguistic roles of vowels in Japanese are more significant than that of vowels in English. We can also consider the difference of perception modes for consonants and vowels. It is generally understood that consonants are categorically perceived, while vowels are continuously perceived by comparative
judgement of acoustic features. If categorical perception is considered one of the factors to draw lateralization of consonants [to the left hemisphere], the appearance of [such lateralization] for vowels in Japanese subjects may indicate that vowels in Japanese are perceived by categorical judgement rather than by continuous judgment." (Shimizu 1975:22)

Tsunoda's studies showed that Polynesians, including Tongans and Samoans, process vowels like Japanese, while Koreans, Chinese, and Bengalis process vowels like Westerners. (Sibatani 1980: 25) Tsunoda noted that "the Japanese and the Polynesian languages are particularly rich in vowels. One can make up complex sentences in Japanese using vowels only." (Sibatani 1980:25) Like Japanese, the Samoan vowels by themselves are meaningful. /a/ means 'of' or 'when', /e/ 'by' or 'you', /i/ 'in', 'on', 'at', 'to', or 'here', /o/ 'of', /u/ 'sting', 'bite', or 'arrow'. (Marsack 1962:137-42) Tsunoda's and Shimizu's discussions of the role, function, and cerebral processing of vowels in Japanese and Polynesian as contrasted to Western languages support my contention that the vocalic/consonantal opposition is different in Samoan than in many Indo-European languages.

COMPARATIVE OBSERVATIONS ON HOW VOWELS AND CONSONANTS ARE USED

In English and many Indo-European languages consonants communicate more informational content and vowels communicate more emotional and social content. Thus, for example, words abbreviated in written English by leaving out the vowels can for to some degree be understood (e.g. vwl & cnsnts). But words abbreviated by leaving out the consonants are not understandable (e.g. oe & ooa). In Samoan leaving out either vowels or consonants renders the word unintelligible. The same is true in Japanese.

In English variation in vowel sounds in a word does not change the word but may communicate social status or other values. For example the word 'data' is pronounced /daeta/ or /deyta/, 'economics' is pronounced /Ekonamiks/ or /iykonamiks/. With the rare exception of a word like 'garage' (/garaz/-/gara/) this kind of variation is not possible with consonants. But Samoan is a different story. Gabelentz reported that "[m]any natives are exceedingly careless and incorrect in the pronunciation [sic] of consonants, and even exchange or transpose them without confusion, and almost unnoticed by their hearers; ... but they are very particular about the pronunciation [sic] of the vowels." (Gabelentz 1891:202; Pratt 1911:3)

Churchill, after discussing the "backing" phenomenon in the Samoan consonants, writes, "When we look at the vowels, we find a different state of affairs. They are fixed to-day at the values which they held at the beginning of our knowledge of the Samoan, and comparison with other languages of this stock enables us to produce the same vowel fixity indefinitely into the past. We are justified, therefore, in the proposition that the vowels are the skeleton of Polynesian speech, the consonants are the garb later induced, and subject to change, in accordance with a motive persisting from a period of a conscious effort to secure a good and satisfying fit.... The permanence of vowel values is so marked a character of Polynesian speech that there is no need to multi-
ply instances." (Churchill 1908:82; cf. Hale 1846:232-33) Churchill begins a paragraph on diphthongs with the phrase, "Now in a language so strongly vocalic as is the Samoan, ..." (Churchill 1908:89)

Churchill contrasts this vocalism of Samoan and Polynesian languages with Indo-European and Semitic languages: "In the [Indo-European] languages ... we find a movement of the vowel elements so facile that systems of inflection have arisen therefrom. The consonant elements remain almost unchanged, as the structural skeleton of the word carrying the initial sense into every most distant dialectic offshoot of the primitive speech stem. Such consonantal modulation as has been observed is restricted to the limited movement classified and recorded in Grimm's, Grasmann's, and Verner's laws. In the Semitic, with its fixed consonants and floating vowels, we find a tongue at the opposite pole from the Polynesian languages, for in them [i.e. in the Polynesian] we are to find the primitive sense in the seldom changing vowels and derivative values expressed through consonants which play back and forth through a very wide range indeed." (Churchill 1908:92; Meillet 1970:29)

Churchward (1926:111) made this interesting observation: "Samoan poetry is characterized by rhythm rather than by metre, and by assonance rather than by rime. The number of accents in each line is a fixed quantity, but not that of the syllables. Identity of vowels (i.e., assonance) is considered to constitute rime, without regard to the consonants." E.g. "'uma / tusu / uga / 'uma" and "Laumua na / tagata / tau-tala" are the endings of rhyming lines in two Samoan songs.

**CONSONANT PREFERENCE PATTERN**

Samoan has four labial consonants as opposed to three dentals. Furthermore, two of those three dentals seem to be relatively infrequent allophonic variants over which the velar variants are preferred. The preference is clearly for grave consonants. The labials are distinctively grave as opposed to the dentals. The velars, while not distinctively grave (being compact as opposed to the diffuse labials and dentals), are redundantly grave in comparison with the dentals. The reason is that the point of articulation for velars is closer to the back of the mouth than that for dentals, leaving a larger buccal cavity with a consequently lower tonality. The labials are farther to the front of the mouth than the dentals, again leaving a larger buccal cavity with a corresponding lower tonality. In articulatory terms, one could say that Samoan prefers buccal peripherality in consonants.

The compact vowel /a/ is produced in a large buccal cavity and is redundantly grave. /a/ accounts for over 25% of the phonemes uttered in Samoan speech. /u/ and /o/ are distinctively grave and account for about 15% of Samoan speech. So over 40% of Samoan speech consists of grave vowels. In light of that fact it is interesting that grave consonants are preferred. The graver allophones of the pairs [t]-[k] and [n]-[ng] are used most of the time. Some 25% of Samoan speech consists of grave consonants. So over 65% of Samoan speech consists of grave phonemes. The remainder consists of the vowels /i/ and /e/ and the consonants /l/ and /s/. The liquid /l/, both vocalic and consonantal, is the most frequent consonant in use in Samoan. /s/ is continuant like the vowels. Nasals are more vowel-like than stops and the velar is the most vowel-like of the nasals (sonorant, grave, compact).
The fricatives /f/, /v/, /s/, continuant like the vowels, have a voiced
/voiceless distinction not found in the stops. That voiced/voiceless
distinction takes place in the labial not dental fricatives. I infer
from this a preference for labials and for fricatives over dentals and
stops because the former are more vowel-like (cf. Meillet 1970:24).

It looks like Samoan does not try to maximize the opposition between
vowels and consonants, since Samoan seems to prefer consonants that are
like vowels over those that are different. Gravity (i.e. low tonality)
and vocalism are the predominant features of Samoan speech.

FURTHER RESEARCH

There are four basic areas in which further research is needed. First,
we need a careful comparative study of the phoneme inventories of the
Polynesian languages and Japanese and Bulgarian (because of its high
reported vowel-consonant frequency ratio). These phoneme inventory
studies need to be coupled with careful phoneme frequency studies of
the spoken languages of Japanese, Polynesian and Bulgarian. Third,
through studies of child language acquisition of speech sounds of
these same languages is essential. And finally, more cerebral dominance
testing needs to be done in these languages also and contrasted with
more that needs to be done in the Indo-European languages. The
cerebral dominance testing needs to be done both on phoneme recognition
in speech and alone as well as distinctive feature recognition. All of
these studies together can greatly increase our understanding of
Samoan, the other Polynesian languages, Japanese, Bulgarian, and
language universals as well, including the elusive nature of the vowel
consonant opposition (Jakobson & Waugh 1979:84-86).

CONCLUSION

This has not been a causal explanation of why the Samoan speech sounds
do things that most other languages don't. I haven't tried to explain
why Samoans process vowels and consonants together in the left hemi-
sphere, or why Samoan speech is 61% vowels, or why Samoan speech is 65%
grave phonemes. I personally think that Samoans like vocalism and
gravity in their speech sounds. I haven't tried to answer why Samoan
sounds the way it does but how it sounds. I have tried to describe
these various concurrent phenomena, all of which are missing from Eng-
lish and many Indo-European languages, and none of which has been de-
dscribed in any depth in the literature on the Samoan speech sounds.

NOTES

1. Roger Lass reminds us of "[t]he power of an epistemological framework
to dictate the shape of its own contents" and warns that "there are no
theory-free observation languages." He claims that "the relativism this [realization]
produces is liberating, not harmful.... In part at
least we realize it is only a frame of thought and not an objective
truth we are accepting. Any power for mischief it may have is steril-
ized so long as it is kept exposed." (Lass 1980:124)

2. The study of word accent and vowel length in Samoan is for another
paper, which will include consideration of Jakobson's observations on
"the incompatibility of a dynamic accent with quantitative vocalic distinctions and with a pitch accent in one phonemic system" (Jakobson 1971:2, 264, 416, 479-81, 526-27, 619, 624-25, 687-99). I have not included the distinction between long and short vowels in Samoan in my distinctive feature analysis here.


4 In articulatory terms, for the vowel /a/ the buccal cavity is open and wide with the sonorant air production freely and continuously passing through the buccal cavity. The consonant /t/ is produced with the buccal cavity much narrower and divided by the tongue; the voiceless air production is released through the buccal cavity by an abrupt motion of the tongue. /p/ is produced with the buccal cavity entirely closed by the lips, while inside the buccal cavity the resonator cavity is more voluminous than the divided cavity in the case of /t/. With /p/ the voiceless air production is released from the buccal cavity by an abrupt motion of the lips. Thus, in a certain sense, both /t/ and /p/ are candidates for optimal consonant in opposition to the optimal vowel /a/. In language acquisition children acquire /p/ first as optimal consonant opposed to /a/ and then acquire /t/, which becomes the optimal, unmarked consonant par excellence ever after in the child's life through adulthood. (Jakobson 1968:87)

5 The only serious attempts at distinctive feature analysis of Samoan have been by Viktor Krupa (1970:78-79; 1982:24-25), in which he analyzes Samoan by the use of four distinctive feature oppositions: diffuse/non-diffuse, grave/non-grave, sonant/non-sonant, and continuant/non-continuant. Krupa is able to analyze all the Polynesian languages with these four oppositions. But I think his zeal for symmetry has resulted in a shallow model that ignores much of what linguists have learned about speech sounds in the twentieth century. For Krupa the distinction between /v/ and /m/ is the difference between continuant and non-continuant. The difference between /p/ and /m/ is the difference between non-sonant and sonant, the same difference that distinguishes /f/ from /v/. Krupa describes the liquid /l/ as diffuse, non-grave, sonant, and continuant. While I think Krupa's analysis of some twenty Polynesian languages has planted seeds for fruitful future work in comparative Polynesian phonemics, I think that my distinctive feature analysis of Samoan is more accurate and complete than his.

6 The distinctive feature analysis I'm contributing to the literature here is the Jakobsonian acoustic features analysis. I have put in articulatory features to help those unfamiliar with Jakobson's approach to understand the acoustic features analysis. I am unpracticed in the sophistries of articulatory features analysis and so make no claim to accuracy, completeness, or artfulness in the articulatory descriptions. The Jakobsonian acoustic features analysis approach is most fully explained in Jakobson & Waugh 1979.

This reasoning assumes that the human faculty for language is basically the same in all times and places, that linguistic processes have always acted as we think they act now. Roger Lass, claiming this to be one of the fundamental axioms of modern linguistics, describes it in these terms: "The Uniformitarian Axiom ... can be called--clumsily but perhaps more informatively—the Principle of Pan-Temporal Uniformity. In its most general form it says: Nothing (no event, sequence of events, constellation of properties, general laws) that cannot for some good reason be the case in the present was ever true in the past.... We can restate [this axiom] in a form more relevant to linguistic history (or historiography): No reconstructed entity, configuration of entities, process of change, or reason for change can have been the case only in the past." (Lass 1980:55-56) Hugh Nibley cautions us against accepting this doctrine unreservedly: "We have all grown up in a world nurtured on the comfortable Victorian doctrine of uniformitarianism, the idea that what happens in this world is all just more of the same: what lies ahead is pretty much what lies behind, for the same forces that are at work on the earth today were at work in the same manner, with the same intensity and the same effects at all times past and will go on operating inexorably and irresistibly in just the same way forever hereafter ... undeviating, ... steady, sure, reliable, ... and gratifyingly predictable." (Nibley 1978:102)

Theodore Dwight, in reporting to the American Ethnological Society in 1848, characterized the Polynesian velar nasal as "a peculiar sound expressed by a modified letter n." (Dwight 1848:227) In English /ng/ only appears in syllable-final position, while in Samoan /ng/ is only in syllable-initial position.

Jakobson and Waugh bring together the classic descriptions of this "backing" phenomenon in an interesting way: "The substitution of /k/ for /t/ and /ng/ for /n/ in Samoan was, as Gabelentz observed, a limited dialectism in 1863 and three decades later appeared 'all over the group; ... it is difficult to say how this change commenced but its spread has been noted and every attempt has been made to arrest it, but without effect. Many of the people now seem unconscious of the difference' (1891:201). The innovation still remained a mere provincialism at the beginning of our century (Neffgen 1903:2), but has now widely expanded, at least in the colloquial language (Arakin 1973:14; cf. Churchward 1926:16), whereas formal Samoan speech preserves the voiceless apicodental stop and the apicodental nasal (Pawley 1960:48). The acute opposites to the grave stop and nasal are carried by the archaic, still valid variants /t/ and /n/." (Jakobson & Waugh 1979:128-29) If this is how it happened, it might be an example of Kurylowicz's 4th Law of Analogy in the realm of phonology: "Quand a la suite d'une transformation morphologique une forme subit la differentiation, la forme nouvelle correspond à sa fonction primaire (de foundation), la forme ancienne est reservee pour la fonction secondaire (fondee)." (Kurylowicz 1949:169) To the extent that this account (of the absence of /k/ followed by the introduction of /k/ followed by the "backing" phenomenon that renders /t/ and /n/ rare allophonic variants of /k/ and /ng/) can be thought of as an analogical process, we would do well to consider Kurylowicz's 2nd Law of Analysis: "Les actions dites 'analoguees' suivent la direction: formes de 'fonction' ---> formes fondees, dont le rapport decoule de leurs spheres d'emploi." (Kurylowicz 1949:164)
Written Samoan today generally does not graphically represent /k/ except in foreignisms and proper names. 't' is used to represent the non-labial non-glottal stop in native Samoan words. This non-labial non-glottal stop, whose allophones are [t] and [k], is acute as compared to the labial and glottal stops. So, the contextual variation takes places in the acute non-labial non-glottal stop, and the preferred variant is the graver [k]. While the glottal stop is grave in Samoan, it may be acute in English (e.g. hot water = [haʔ wadː]).

Dr. Rey L. Baird, BYU Linguistics Dept., personal conversation.

I wish to thank my sister-in-law Dawn Barker for helping me with the phoneme frequency studies by programming her Atari 1200XL for the job.

My frequency counts made on transcriptions (Buse & Duranti below) of Samoan ceremonial speeches show the frequency of occurrence of the glottal stop to be between 5 and 8 percent, with the rest of the phonemes in basically the same relative frequencies as above. In written Samoan glottal stops are not graphically represented every time that they are used in the spoken word. It may be that glottal stops are only written when necessary to distinguish two written words. E.g. the word /faʔa/ is usually written "faa" and not "fa'a", there being no competing form.

/r/ and /h/ are used only in foreignisms. It appears from their absence in the Buse and Duranti material below that /r/ and /h/ are even less frequent in spoken Samoan than in written. It may be that the medium in which Samoan is communicated may influence the occurrence of /r/ and /h/, somewhat like the social context influences the contextual variation of /t/ and /k/. On the other hand, the willingness to write 'r' and 'h' contrasts with the unwillingness to write 'k'.

George Dewey, from a corpus of 100,000 words, about 650,000 phonemes, gives these figures: vowels 37.90%, consonants 62.10% (Dewey 1950:125) and vowels 37.66%, consonants 62.34% (Dewey 1970:26). A. Hood Roberts, from a corpus of 66,534 phonemes, gives the figure of vowels 36.11% and consonants 63.89%. (Roberts 1965:112) Kramsky, from a corpus between 1300 and 3800 phonemes, gives the figures of vowels 37.6% and consonants 62.4%. (Kramsky 1959:111)

Kramsky (1959:111) has provided the following comparative phoneme frequency data (taken from corpuses of 1,372 to 3,867 phonemes) to which I have added Roberts' and Dewey's and mine:

<table>
<thead>
<tr>
<th>Language</th>
<th>Vowels</th>
<th>Consonants</th>
</tr>
</thead>
<tbody>
<tr>
<td>English (Indo-European)</td>
<td>36.1</td>
<td>63.9</td>
</tr>
<tr>
<td>German (Indo-European)</td>
<td>37.1</td>
<td>62.9</td>
</tr>
<tr>
<td>English (Indo-European)</td>
<td>37.6</td>
<td>62.4</td>
</tr>
<tr>
<td>English (Indo-European)</td>
<td>37.7</td>
<td>62.3</td>
</tr>
<tr>
<td>English (Indo-European)</td>
<td>37.9</td>
<td>62.1</td>
</tr>
<tr>
<td>Armenian (Indo-European)</td>
<td>39.6</td>
<td>60.4</td>
</tr>
<tr>
<td>Ishkashimi (Indo-European)</td>
<td>41.6</td>
<td>58.4</td>
</tr>
<tr>
<td>Lakh (Caucasian)</td>
<td>41.6</td>
<td>58.4</td>
</tr>
</tbody>
</table>
Czech (Indo-European) 41.8 58.2
Russian (Indo-European) 42.0 58.0
Turkish (Turkic) 42.1 57.9
Chuvash (Turkic) 42.1 57.9
Kalai-Khumb (Indo-European) 42.2 57.8
Indonesian (Indonesian) 44.0 56.0
French (Indo-European) 44.2 55.8
Arabic (Semitic) 44.7 55.3
Arapaho (American) 46.4 53.6
Chinese (Sino-Tibetan) 47.1 52.9
Albanian (Indo-European) 47.4 52.6
Hausa (Hamitic) 48.5 51.5
Gola (African) 48.7 51.3
Sakalava (Indonesian) 50.2 49.8
Siane (New Guinea) 50.9 49.1
Inamwanga (African) 51.0 49.0
Japanese (Far East) 51.5 48.5
Bulgarian (Indo-European) 56.3 43.7
Samoan (Polynesian) 61.0 39.0 (Claussen)

Kramsky 1966:151 also provides relative frequencies of occurrence of vowels within vowel systems in languages with five vowels. Some of his results are here compared with those of this study:

<table>
<thead>
<tr>
<th>LANGUAGE</th>
<th>/i/</th>
<th>/u/</th>
<th>/e/</th>
<th>/o/</th>
<th>/a/</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japanese</td>
<td>22.21</td>
<td>12.83</td>
<td>9.79</td>
<td>28.02</td>
<td>27.15</td>
</tr>
<tr>
<td>Tahitian</td>
<td>20.39</td>
<td>13.53</td>
<td>16.12</td>
<td>14.00</td>
<td>35.96</td>
</tr>
<tr>
<td>Samoan</td>
<td>18.5</td>
<td>10.8</td>
<td>14.4</td>
<td>14.1</td>
<td>42.1 (Masterman/Samoa Times)</td>
</tr>
<tr>
<td>Samoan</td>
<td>14.3</td>
<td>15.2</td>
<td>14.4</td>
<td>15.6</td>
<td>40.5 (Buse/Duranti)</td>
</tr>
<tr>
<td>Samoan</td>
<td>14.6</td>
<td>14.1</td>
<td>16.5</td>
<td>12.8</td>
<td>42.0 (Baird)</td>
</tr>
</tbody>
</table>

Note Samoan's strong preference for /a/. Tahitian's preference for /a/, not as strong as Samoan, is more pronounced than Japanese.

18 The five Japanese words consisting of one vowel are lexical words, while the Samoan ones except /u/ are grammatical words.

19 Excluding the liquid /l/, which is both vocalic and consonantal.

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Scriptural perspectives of academic fields have been encouraged by leaders in LDS higher education. Statements by Wilkinson (1959), Bergin (1979), Maxwell (1976), and others are supportive of scholarship that considers both revelatory religious truth and the best of secular knowledge.

The purpose of this computer study was to identify scriptures useful to reading professionals. In a two-part study, Bible scriptures were first considered. They were extracted from 4,800 passages generated from student papers, concordances, 49 reading-related key words and a computerized text of the King James Bible. After a culling process, 415 scriptures were organized under 17 topic headings familiar to reading teachers. More recently by the same computer process, a second list of about 1,400 scriptures was extracted and compiled from the LDS Triple Combination.

The 17 topic headings include the following: (1) Reading Teachers; (2) Importance of Reading: (3) Reading Purposes and Promises; (4) Effects and Results of Reading; (5) Reading Difficulties; (6) Reading Comprehension; (7) Language and Vocabulary; (8) Reading Readiness; (9) Reading methods; (10) Research, Writing, Publication, Dissemination; (11) Readability; (12) Reading and the Savior; (13) Reading and Censorship; (14) Reading Preservation; (15) Miscellaneous; (16) Reading Comprehension; Questions and Answers; (17) Content Descriptions of Reading.

Two publications intended for non-LDS academic audiences based on reading related Biblical passages have been generated by the Bank (Cranney, 1981, 1982). A second as yet unpublished paper (Cranney, 1982) has also been written based on the LDS Triple Combination and references from the life of Christ.

Prospective uses of the Bank are as follows: identify priority ideas and principles of reading; generate ideas for student papers, theses, and dissertations; assist students making bridges between their religious faith and the reading profession; provide teaching and illustrative materials for teachers; help adult basic students whose primary motivation in learning to read is religious; and clarify the role of reading in an LDS context.

Cautions are noted in reading into scriptural references ideas that are unwarranted when the total context is considered. Problems of finding publication outlets were also encountered. In presenting ideas in language and tone acceptable to the profession, the LDS author must sometimes write in a less than totally authentic manner to communicate creditably with scholars not of his own faith.
Difficult to describe but important is the cognitive and affective experience of the author in compiling and working with the Bank. A gentle, absorbing excitement seems to accompany the work with the scriptures. Patterns, associations, and ideas emerge that suggest teaching units, papers, research, and a kind of writing atypical of most academic publication. The author has found such activity to be attracting and fulfilling, especially when a topic is given sustained attention for a period of several hours. To express it another way, a saturation in scriptures on a given topic seems productive of ideas in a way not normally experienced when the academic context is considered alone. Since significant ideas are the substance of research and teaching, use of the Bank is recommended to interested reading professionals. They, in turn, could contribute to it from the perspective of their discipline and the experience of their faith.

An existing model in longtime use at the Brigham Young University Counseling Center is a counseling psychology scripture corpus compiled by Burton Kelly (1981). It, too, generated teaching techniques, a small amount of research, and a counseling approach that by the report of its principal user has strengthened the process of psychotherapy. The Reading Scripture Bank then represents a similar resource to the reading professional, one that can provide a dimension to teaching and research not usually considered in traditional scholarly approaches to the field.

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THE ±TENSE FEATURE OF CONSONANTS.
IS IT DETERMINED UNIVERSALLY BY THE /h/ PHONEME?

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Brigham Young University

Roman Jakobson, in his book "The Sound Shape of Language," supports the thesis of André Martinet that "the presence of the phoneme /h/ in languages makes particularly clear the fact that the valid feature is not voiced/voiceless but rather tense/lax (with a marked tenseness)." In essence, Martinet is saying that if a language has the /h/ phoneme then the distinction between obstruent pairs will be relative tenseness and not voicing, such as with English /k/ and /g/:

"cot" [khat], "got" [gat].

Thus /k/ is aspirated in the initial position, aspiration being the contextual variant of the feature [±tense] in English stops. A non-aspirate /k/ occurs after /s/ in the word "scat" [skæt]; but in the word final position of "sack" [sæk], the unreleased /k/ is still more tense than the /g/ in "sag" [sæg]. The word initial aspiration of the stops is the marked, tense form, and also is a redundant feature of English speech.

Jakobson said that "Yiddish dialects subject to Slavic influence substituted the voiced/voiceless feature for the tense/lax one, and this change was paralleled by the loss of /h/." The relationship between the presence of the glottal spirant and the tense/lax feature seems to be a strong linguistic force, or tendency. The speakers of languages that lack the /h/ phoneme often experience confusion when attempting to communicate in a language that has it. This is evidenced by the pronunciation of native Spanish-speakers learning English. In general, they have difficulty discriminating and producing the consonants of such minimal pairs as "bit" [bɪt]/ "pit" [pɪt], pronouncing the latter as [pit], with voiceless [p] instead of the aspirate English [ph], and probably with the tense vowel /i/ instead of the lax /ə/. French maintains its h aspiré in a latent form that appears orthographically as "h" but is "implemented as a glottal catch when preceded within a phrase by a word with a final consonant--e.g., il hache [il əs]; for certain speakers such use is obligatory, for others it is optional." The fact that French has a latent /h/ phoneme may be evidence that Latin (the parent of the Romance languages: Spanish, French, Italian, etc.) also had an /h/, a point that is somewhat debated. According to Robert Hall, the "Old Castilian /h/- (lost in modern standard Spanish, but preserved in spelling and in some dialects)" is ascribed to the influence of the substratum language of Basque, that had an /h/ but no /f/. The /f/ was replaced by /h/ from Latin to Spanish, e.g., formica > hormiga "ant".

Do the above phenomena occur arbitrarily? Or are they governed by specific linguistic laws of phonemic hierarchy? In the discussion of the hierarchical order that is evident in the way that children acquire consonants, Jakobson said:

"The acquisition of back consonants presupposes in the linguistic development of the child the acquisition of front consonants, i.e., labials and dentals; and, in particular, the acquisition of back oral and nasal stops presupposes the acquisition of front oral and nasal consonants. Similarly, the acquisition of back fricatives presupposes..."
the acquisition of front fricatives, and, on the other hand, that of back consonants. The existence of back consonants in the languages of the world presupposes accordingly the existence of front consonants. The solidarity is not reversible: the presence of front consonants in no way requires the presence of back consonants. In other words, no language has back consonants without containing front consonants. On the other hand, there are some languages with labials and dentals, but without back consonants, as, e.g., the language of Tahiti in which both velars--/k/ and /g/--have changed to /ŋ/ and Kasimov-Tatar, in which all velars--both stops (voiceless and voiced, oral and nasal) and fricatives--were also replaced by the glottal stop."

By applying the principle of irreversible solidarity, we see that the tense/lax consonant distinction can not be made by a child until he has integrated the /h/ in his phonology. The correlation between the acquisition of /h/ by English speaking children and their ability to produce tense (aspirate) consonants became evident when I heard my twenty month old nephew call me Dom [dam], instead of Tom [tham]. At that I proceeded to test him on his phonology. First, I tried to get him to say "hat" but he wouldn't cooperate. When his mother got him to to say it, he, in fact, did pronounce the /h/. Later, I made a paper hat and started to play with him. I repeatedly tried to get him to say "hat," but without success. About ten minutes after I gave up on him, he picked up the paper hat and brought it to me saying [ət...ət] as he waved it in front of me. Thus, when he started producing the word on his own, he was unable to pronounce the /h/, even though he had successfully mimicked it earlier. I tested him with several other words and achieved the same results--no /h/, and no tense/lax distinction among stops. A month later, I noted that he still hadn't acquired the /h/ when he pointed to the fire in the fireplace and said: [ət] "hot"; and when I touched my hair and asked him what it was he replied: [ər] "hair." Along with this, he was still unable to produce aspirate consonants.

"It seems likely that children of all languages first produce predominantly unaspirated stops and aspirated variants not conditioned by the surrounding sounds, then gradually acquire the pattern of aspiration in the language they are learning." 5

An apparent counter-example to the /h/ phoneme hypothesis is Yucatec-Mayan, which has an /h/ phoneme, but lacks aspirate consonants. (See table #1 in the Appendix). However, the tense/lax feature goes beyond aspiration to include a much larger set of possible variants.

"While vowels are easily subject to a dilation of their energy into length, consonants find their marked opposites in the higher rate of energy discharged within a reduced interval of time vs. a lower rate of discharge within a longer interval. The marked term of this feature is obtained by the different varieties of extrapulmonic consonants. The merely contextual difference between two of these varieties--ejectives and implosives--has been confirmed by Greenberg on rich material....The consonantal abbreviation feature is, in relation to the vocalic prolongation feature, one of the striking examples of the mirror symmetry relating the consonantal and the vocalic subsystems to each other. Yet apparently the shortening of the
checked consonants finds its counterpart in prolongation as a typical particularity of the tense consonants in their opposition to the unmarked, lax ones. The frequent co-occurrence of three corresponding consonants—tense, lax, and checked—speaks in favor of this interpretation.\footnote{7}

From this we may understand that the glottalized consonants of Yucatec-Mayan represent the tense, marked set, with a "higher rate of energy discharged" than their lax counterparts. Although voiced stops, also classed as lax, are present in the language, they were borrowed from Spanish, and are included in the paradigm within parentheses. Glottalization is characterized by the distinctive feature \[\text{\texttt{[\textasciitilde\text{checked}]}}\], and is represented by (') after the consonants in table \#1.

"As we have said, the analysis of the most varied languages reveals general synchronic laws of solidarity. According to these laws, a secondary value cannot exist in a linguistic system without the corresponding primary value. From this fact two consequences necessarily emerge for the evolution of any given linguistic system as well: without the primary value, the corresponding secondary value cannot arise in a linguistic system, and without the secondary value, the corresponding primary value cannot be eliminated. Thus, the laws of solidarity turn out to be panchronic. They retain their validity at every stage and in the course of every change of all the languages of the world."\footnote{8}

Would a language that had no /h/ but maintained a tense/lax feature among consonants be considered a counter-example to Jakobson's hypothesis? Mam, a Central American Indian dialect, is an example of such a language. (See table \#2). With respect to irreversible solidarity, the tense/lax distinction does not presuppose an /h/ in the language, in other words, \[\text{\texttt{[\textasciitilde\text{tense}]}}\] can be the valid feature of a language without the /h/ phoneme. If you have a banana you have a fruit, but if you have a fruit, you don't necessarily have a banana, i.e., it is possible to have tense/lax without /h/; therefore, Mam is not a counter-example.

"Every phonological system is a stratified structure, that is to say, is formed of superimposed layers. The hierarchy of these layers is practically universal and invariable. It occurs in the synchrony of language; consequently we have to do with a panchronic ordering. If there exists a relationship of irreversible solidarity between two phonological values, the secondary value can not exist without the primary and the primary cannot be eliminated without the secondary. This ordering is to be found in any existing phonological system, and it governs all its mutations; the same ordering determines...the acquisition of language."\footnote{9}

Igbo, a West-African language, is an example of a highly stratified system with various levels of phonemic marking distinctions. (See table \#3). Some of the rarer phonological possibilities of language have been taken to the extreme, such as aspiration and nasalization. Igbo has both a tense/lax and a voice/voiceless distinction. According to Jakobson's hypothesis, it could not have such a variety of aspirate stops without first having the glottal fricative, just as it could not have nasalized fricatives without nasal consonants.
With respect to irreversible solidarity, Jakobson is in essence saying that no language has the /h/ phoneme without a concomitant tense/lax feature for consonants. Whether the distinction is made by aspiration, glottalization, or some other form of internal pressure and marking, if there is a distinction between higher and lower energy releases then the opposition in question is identified by the tense/lax feature.

All that has been discussed thus far upholds the position of Roman Jakobson; but now let us examine a contrary point of view.

Royal Skousen's criteria for an acceptable theory challenges the validity of the tense/lax feature. He said:

"A theory is tested by its ability to predict the nature of linguistic behavior. Thus a theory is composed of two parts: (1) the rules of induction and (2) the empirical interpretation of descriptions. A theory without an empirical interpretation is not really a theory because it is not testable."

In light of this definition, a conflict arises when classification terms are used as explanations of speech phenomena. There are some phonologists who would say that Jakobson was premature in postulating such a hypothesis, that a relationship between the presence of /h/ and the [±tense] feature in a language can not be empirically verified, and that such postulation is purely taxonomic. John Ohala said:

"Discovery of sound patterns, though no simple task, is only the beginning of the phonologist's task: he must, as any scientist must, seek to explain the patterns he finds. There may be some who honestly don't want to explain things--they just want to classify sound patterns and engage in pure taxonomy. I can't say I know any card-carrying taxonomists, but if I were to meet one I would respect him and his philosophy even though I disagreed with it. But it is difficult to have respect for certain others who profess to be interested in explaining sound patterns but in fact are secret taxonomists. These phonologists, for example, may notice that one group of sounds do one thing whereas another group does the opposite. But rather than seek an explanation for this difference in behavior they simply tack on different labels to the two groups, X and not-X, and then "explain" the behavior of a given sound or the whole group of sounds as being due to the fact that they are "X" (or "not-X"). The label, "X", of course has to be an undefined term with no empirical content, e.g., strength, chromaticity, bleaching, sonority, or syllabicity (as it is applied to individual speech segments). The progress of a field is inhibited when labels are offered as explanations. It is far preferable to simply admit "things happen this way but I don't know why."

Verification and empirical observation are necessary elements of a good theory; but these should not be allowed to hinder creative thought on the part of the theorist. Even if his idea is later proven false, he should be given credit for caring enough about the subject to try and describe it. Dreams and abstract notions have often led man to the truth, although some have led him to dead ends. The responsibility to test theories rests upon the researcher, who is possibly a theorist himself.
Wading through data will probably always be an integral part of this process. Derek Bickerton, in his book "Roots of Language," said:

"Empirical knowledge is no guarantee of certitude, and its absence no barrier to insight....What is needed is not dogged fact-gathering (with or without moral sermons) but the capacity to distinguish between the trivial and the nontrivial. The task of the theorist is to tell the field worker where to look and what to look for, and if the latter chooses to reject such aid, he has about as much brain as the man who throws away his metal detector and proceeds to dig by hand the three-acre field where he thinks treasure lies buried."  

Jakobson is a linguistic metal-detector: he has located and pointed out many important theoretical concepts and ideas that deserve a closer look; in effect, he has told us where we might successfully dig to uncover some hidden truths about language. Nevertheless, with respect to his tense/lax feature, there remain some unanswered questions and doubts. Beside the fact that [±tense] is not an empirical feature, and only serves as a name to classify a phenomenon, the theory that the presence of /h/ in a language presupposes tenseness over voicing does not allow for the existence of all the logical possibilities.

Huntington's theorem states that "the number of elements in every logical field must be $2^m$ where $m = 1, 2, 3..."  

Therefore, although it would contradict Jakobson's hypothesis, there can exist by logic a fourth possibility--that of /h/ without [±tense]. The paradigm of $2^2$ would appear as in Figure #1, with all the logical elements.

(Figure #1)

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<tr>
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From the Kutubuan language family of New Guinea, the two main languages Fasu and Foe, are aligned in phonemic comparison in Figure #2.
Both Foe and Fasu have the /h/ phoneme, yet "Foe has a series [of] aspirated stops /t,k/ contrasting with a series [of] unaspirated stops /b,d,g/; this contrast is missing in Fasu."\textsuperscript{15} Fasu is clearly a candidate for the empty slot of the 2\textsuperscript{2} paradigm--the counter-example to Jakobson's hypothesis. Is Fasu breaking the law of "Irreversible Solidarity"? It might be argued in Jakobson's favor that the fricatives /f,s/ are acting as relatively lax counterparts to the stops. Conceivably, a stop could be paired with a fricative. Spanish voiced stops, for example, are realized as fricatives intervocically, but these particular contextual variants are not governed by /h/. It is then somewhat questionable that the stops and fricatives of Fasu are truly in opposition to one another. We may well ask: Is the /h/ phoneme so omnipotent that the theory is without contradiction? Although inconvenient, the truth to the question of Fasu can be tested by going to New Guinea to observe native speakers.

Some other possible counter-examples are Finnish and Hawaiian. The historical phonology of Finnish includes three unaspirated, voiceless stops (See Table \#4). The existing voiced stops, /b,d,g/, came into the system through a borrowing from Swedish; and even these are realized as voiceless in the speech of many natives. The Finnish /h/ was part of the phonological inventory before any such loans occurred; this was a time when only one set of obstruents were present, without any oppositional pairs. Hawaiian also has the /h/ phoneme along with the voiceless stops /p,k/, but these have no tense counterparts. Vowel length is of greater significance, while the distinction and variety of consonants is minimal. The /h/ "occurs in virtually all present-day Polynesian languages."\textsuperscript{16} Interestingly, a minority of these languages do have aspirate stops paired with unaspirated, voiceless complements--a definite example of tense/lax. Part of this small group with the [\textit{[tense]}] feature has the /h/ phoneme, while the other does not; thus following exactly the postulation of Jakobson, and his hierarchy of "Irreversible Solidarity." Nevertheless, they are the minority in the Polynesian family. The majority, Hawaiian being the most widely known, has the /h/ with no apparent category of tense versus lax--a direct contradiction to the hypothesis in question.

Undoubtedly, the /h/ phoneme plays some kind of role in the phonological hierarchy of language, and it seems unlikely that such relationships and hierarchies are coincidental, especially with regard to the acquisition order of phonology in children; however, Martinet's hypothesis as promoted by Jakobson does not
satisfactorily explain the phenomenon. To the question: is the tense/lax feature universally determined by the /h/ phoneme? The answer with the present data would be no. Jakobson has singled out an interesting, strong linguistic tendency; and through broader investigation, we may conclude that he was right; but the four logical possibilities of the /±h/, [±tense] paradigm represent algebraic truth that cannot be dismissed. The evidence favors the notion of the fourth category, and suggests that the phenomenon of tense/lax occurs independently of /h/. Further research needs to be done to arrive at a more stable and certain conclusion, but let this paper suffice to also point in a direction that deserves more than a passing glance.
APPENDIX

(Table #1) Yucatec–Mayan Phonology

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(Table #2) Phonology of Mam

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Spanish phonemic borrowings

|        | b    | d    | g    |
| stops (voiced) |      |      |      |

*These are imploded.
(Table #3) Igbo Phonology

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(Table #4) Finnish Phonology

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<tr>
<td>M</td>
<td>m</td>
<td>n</td>
<td>ɲ</td>
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<tr>
<td>N</td>
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<tr>
<td>V</td>
<td>v</td>
<td>j</td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
NOTES


2Ibid. p. 151.

3Ibid. p. 151.


8Jakobson, (1968), p. 53.


15Ibid. p. 155.

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The vowels of Portuguese have been the subject of many varying studies. The vast majority of these studies has been largely intuitive in nature and they have also largely followed the same pattern. The tremendously complex phonological system has been reduced to generalizations, which though commendable in their effort and intent, do not present the reality of detail and thorough investigation that Portuguese merits. The very fact that Portuguese possesses nasal vowels leads to that important distinction. The history of the Romance languages would, in turn, suggest that tonic versus atonic vowels should also be studied because of their different evolution.

Linguists familiar with Portuguese would generally agree that in tonic position the vowel system of Brazilian Portuguese is made up of a set of seven oral vowels. In graphic form it appears this way:

```
i
  e
  a
```

These vowels were first studied acoustically by Lacerda & Canellada in a comparative study of Spanish and Portuguese vowels. They made recordings of their own voices and analyzed the acoustic signals using a chromograph, an early type of oscilloscope. They studied not only the tonic vowels, but the atonic vowels as well. However, no conclusions could be drawn from their research because of the primitive nature of their equipment. Their findings were first published serially in the Revista de Filología Española beginning in 1942, and in book form in 1945. In 1950, Lacerda published a book analyzing the sounds of Portuguese utilizing the same research techniques.

During the same period, great strides in the area of experimental phonetics were being made in the United States. In 1941, a spectrographic development project was begun by Bell Telephone Laboratories. By 1943, an experimental model had been completed and was being used to explore "visual hearing" possibilities. The most
significant feature for our purposes was its ability to separate the compound sound wave into its unique components allowing phoneticians to readily distinguish vowel quality.

Only a few researchers have applied spectrographic techniques to the study of Portuguese vowels. Among the more significant studies dealing with tonic vowels are Head (1965), Martins (1973), Fails (1977), Godínez (1981) and Clegg & Fails (1983). A review of most of these articles is found in Godínez (1981).

Head's study was phonemic in nature but based on acoustic results. He did a distinctive feature analysis of Carioca and Lisbon speech. Martins' study is a careful, controlled analysis of Peninsular tonic vowels. She chose 8 university educated males and had them repeat a sentence inserting 69 different test words to provide both syntactic and phonetic control. Godínez patterned his study somewhat after that of Martins. He analyzed 9 male speakers from different regions of Brazil. He had them repeat a set of 7 words within a model sentence and then, like Martins, averaged the results. The results from the study by Martins appear in Table 1.

<table>
<thead>
<tr>
<th>Vowel</th>
<th>F1</th>
<th>F2</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>294</td>
<td>2344</td>
</tr>
<tr>
<td>e</td>
<td>403</td>
<td>2084</td>
</tr>
<tr>
<td>e̞</td>
<td>501</td>
<td>1893</td>
</tr>
<tr>
<td>ẽ</td>
<td>511</td>
<td>1602</td>
</tr>
<tr>
<td>a</td>
<td>626</td>
<td>1326</td>
</tr>
<tr>
<td>o</td>
<td>531</td>
<td>994</td>
</tr>
<tr>
<td>o̞</td>
<td>426</td>
<td>864</td>
</tr>
<tr>
<td>u</td>
<td>315</td>
<td>678</td>
</tr>
</tbody>
</table>

Table 1. The formant frequencies of Portuguese tonic oral vowels according to Martins (1973).

In our previous studies (Fails 1977; and Clegg and Fails (1983) we obtained formant frequencies for the tonic oral vowels which compare favorably with the results of Martins and Godínez. The averaged results of our 1983 study are given in Table 2.
In addition to oral vowel studies, there have also been traditional studies on the nasal vowel system in tonic position. They posit a system of five nasalized vowels for Portuguese where the distinctions between open and closed /e/ as well as between open and closed /o/ are neutralized. They can be represented graphically this way:

\[
\begin{array}{c@{\quad}c@{\quad}c@{\quad}c}
\text{I} & \text{O} \\
\text{e} & \text{u} & \text{o} \\
\end{array}
\]

The most significant acoustic studies dealing with nasal vowels are those of Head (1965), Head & Lacerda (1966) and Almeida (1971) and (1976). We read the results of our own research on nasalized vowels at the AATSP convention in August. A summary of our results include the following:

1) The high nasalized vowels [I, O] showed approximately the same formant frequencies as their oral counterparts.

2) The mid nasalized vowels [e, o] lie acoustically in between the oral vowels [e, e] and [o, o] respectively. This is acoustic evidence for the neutralization of the mid vowels in a nasal environment.

3) The low vowel when nasalized is markedly raised causing an adjustment in the traditional vocalic triangle. The averaged results are given in Table 3.
The results of these previous studies aid in understanding certain aspects of the vowel system. However, there are several other areas that need to be considered. One of these is vowel timbre in atonic position. Both Martins and Godínez, as well as most others, studied only tonic vowels.

Most traditional studies indicate that in atonic non-final position there is a set of five oral vowels. There is some controversy as to whether this is really a five vowel set or if there are seven vowel phonemes as in tonic position. There is also some question as to the timbre of the phoneme /a/. A graphic representation of the five vowel set looks like this:

```
i u
  e o
```

/a/e

In final atonic position, consensus provides a set of three oral vowels as well. However, no acoustic data is available for these vowels either. A graphic representation looks like this:

```
i u
  ə
```

<table>
<thead>
<tr>
<th>Vowel</th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>285</td>
<td>2203</td>
<td>3013</td>
</tr>
<tr>
<td>e</td>
<td>466</td>
<td>1902</td>
<td>2685</td>
</tr>
<tr>
<td>ẽ</td>
<td>556</td>
<td>1434</td>
<td>2381</td>
</tr>
<tr>
<td>o</td>
<td>486</td>
<td>987</td>
<td>2362</td>
</tr>
<tr>
<td>ɐ</td>
<td>318</td>
<td>900</td>
<td>2371</td>
</tr>
</tbody>
</table>

Table 3. The formant frequencies of Portuguese nasalized vowels according to Clegg & Fails (1983).
The purpose of this study was to add spectrographic evidence to substantiate the existing data and to provide new information on atonic vowels.

We designed a wordlist including examples of each vowel in tonic, initial atonic, pretonic, post-tonic and final atonic positions. We also provided examples of each of these categories in both open and closed syllables. In order to test for open /e/ and /o/ in atonic position we included the sentences "Um café pequeno é um cafezinho" and "Uma bola pequena é uma bolinha." Finally, a series of words with consonant clusters was added that could trigger the "i intercalada."

We followed general procedure in the selection of our informants. We were cautious to ensure their normal speech capability, uniform age and sex and socio-economic background. In the literature it was pointed out, as might be expected, that there was a sharp difference between male and female speakers. We therefore chose 10 male informants. They ranged in age from twenty to twenty-nine and came from five different regions of Brazil (São Paulo, Rio de Janeiro, Brasília, Paraná and Paraíba).

Recordings were made using the condenser microphone of a Sony 5600 cassette recorder. The cassettes were then played through a Harman/Kardon CD301 tape deck into a Digital Sona-Graph™ model 7800. We first made 3D Sonagrams displaying from 0-4000 Hz. through a 250 Hz. analysis filter. We also ran power spectra on one speaker to corroborate the 3D spectrograms and to provide additional information on the intensity. The nuclei of the vowel formants were measured with a calibrated hand ruler and were recorded. F1 and F2 were subsequently plotted on Koenig graph charts for visual facility.

FINDINGS

1) Tonic. The formant frequencies we obtained for the tonic oral vowels compared favorably with results of other scholars and with our own previous research. The only area of difference is in the second formant of phoneme /u/. Our results in this study indicate a higher second formant. No appreciable difference was found in formant frequencies between tonic vowels in open syllables and those in closed syllables. The averaged results are given in Table 4 and are graphed in Fig. 1.
Table 4. The formant frequencies of Portuguese tonic oral vowels.

<table>
<thead>
<tr>
<th>Vowel</th>
<th>F1</th>
<th>F2</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>293</td>
<td>2149</td>
</tr>
<tr>
<td>e</td>
<td>383</td>
<td>1936</td>
</tr>
<tr>
<td>ɛ</td>
<td>539</td>
<td>1659</td>
</tr>
<tr>
<td>a</td>
<td>713</td>
<td>1264</td>
</tr>
<tr>
<td>o</td>
<td>545</td>
<td>939</td>
</tr>
<tr>
<td>o</td>
<td>399</td>
<td>780</td>
</tr>
<tr>
<td>u</td>
<td>318</td>
<td>896</td>
</tr>
</tbody>
</table>

Fig. 1. The tonic vowels of Portuguese.
2) Pretonic. We found no appreciable differences between the formant frequencies of initial atonic versus pretonic vowels nor between open and closed syllables for these two positions. Our results show a five-vowel system. The averaged formant frequencies for pretonic vowels are given in Table 5 and graphed in Fig. 2.

<table>
<thead>
<tr>
<th>Vowel</th>
<th>F1</th>
<th>F2</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>286</td>
<td>2120</td>
</tr>
<tr>
<td>e</td>
<td>364</td>
<td>1940</td>
</tr>
<tr>
<td>a</td>
<td>635</td>
<td>1319</td>
</tr>
<tr>
<td>o</td>
<td>388</td>
<td>779</td>
</tr>
<tr>
<td>u</td>
<td>292</td>
<td>821</td>
</tr>
</tbody>
</table>

Table 5. The formant frequencies of Portuguese pretonic oral vowels.

Fig. 2. The pretonic vowels of Portuguese.
The test words ("opçãoc", "optar", "repugnante" and "advogado") designed to elicit the "i intercalada" produced varying results. There were several cases where there were no "intercaladas". Those cases where a high vowel was produced resulted in a first formant frequency of 315 and a second formant frequency of 2042 which compares to a tonic /i/.

We also included in our study the two sentences that examined the open /e/, /o/ in pretonic position. Azevedo (1981, p. 12) notes that while the opposition between open and closed /e/, /o/ is systematically neutralized in atonic position, the open vowels may occur in pretonic position in morphological derivations. In our pairs of words "café/cafezinho" and "bola/bolinha" we found that the second formants of both vowels compare favorably with the second formants of their tonic counterparts. However, the first formants are situated midway between the first formants of the tonic open and closed phonemes /e/ and /o/. This is shown graphically in Fig. 3.

Fig. 3. The pretonic vowels of "cafezinho" and "bolinha" compared with open and closed tonic /e/ and /o/.
3) *Post-tonic.* The formant frequencies of post-tonic vowels are shown in Table 6 and graphed in Fig. 4.

<table>
<thead>
<tr>
<th>Vowel</th>
<th>F1</th>
<th>F2</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>303</td>
<td>1942</td>
</tr>
<tr>
<td>e</td>
<td>348</td>
<td>1900</td>
</tr>
<tr>
<td>a</td>
<td>408</td>
<td>1340</td>
</tr>
<tr>
<td>o</td>
<td>328</td>
<td>918</td>
</tr>
<tr>
<td>u</td>
<td>300</td>
<td>822</td>
</tr>
</tbody>
</table>

Table 6. The formant frequencies of Portuguese post-tonic oral vowels.

*Fig. 4. The post-tonic vowels of Portuguese.*
3) **Final atonic.** We found no appreciable difference in vowel formant frequencies between open and closed syllables in final atonic position. The formant frequencies of final atonic vowels are shown in Table 7 and graphed in Fig. 5.

<table>
<thead>
<tr>
<th>Vowel</th>
<th>F1</th>
<th>F2</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>290</td>
<td>2039</td>
</tr>
<tr>
<td>e</td>
<td>445</td>
<td>1416</td>
</tr>
<tr>
<td>u</td>
<td>329</td>
<td>809</td>
</tr>
</tbody>
</table>

Table 7. The formant frequencies of Portuguese final atonic oral vowels.

Fig. 5. The final atonic vowels of Portuguese.
CONCLUSIONS

The results of our study show:

1) There is no appreciable difference in vowel formant frequencies between open and closed syllables in any position.

2) There is no appreciable difference in vowel formant frequencies between initial atonic and pretonic vowels.

3) There is a seven-vowel system in tonic position in Brazilian Portuguese as shown in Fig. 6. They are included to provide a point of comparison for the atonic vowels.

4) There is a five-vowel system in pretonic position shown in Fig. 6. In this system, the high vowels /i/ and /u/ are comparable to their tonic counterparts. The mid vowels /e/ and /o/ are comparable to tonic closed /o/ and /e/. They do not converge to a point midway between the open and closed mid vowels. The low vowel /a/ is slightly raised as compared with its tonic counterpart.

5) The post-tonic vowels are shown in Fig. 6. There is a merging of the high and mid vowels in post-tonic position. These vowels appear to moving towards a neutralization. The low vowel /a/ is highly raised to a position above that of the final atonic /a/.

6) There is a three-vowel system in final atonic position. This is shown in Fig. 6.

This research should serve to broaden as well as confirm what we know about the vowel system in Brazilian Portuguese.
Fig. 6. A comparison of the tonic and atonic vowels of Portuguese. Tonic vowels are designated with *, pretonic vowels with *, post-tonic vowels with 0, and final atonic vowels with _. 

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The Model for the Isaiah Passages
in German Translations of
the Book of Mormon

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Brigham Young University

As an introduction to the problem in German, let us examine the solution Joseph Smith used when he translated from the original into English and came across the traditional, well-known text of Isaiah. In his book The Problems of the Book of Mormon (Salt Lake City: Bookcraft, 1964, p. 253), Sidney B. Sperry gives what I believe to be a logical explanation of how Joseph Smith proceeded when he was confronted with the problem of translating the Isaiah passages in the Book of Mormon.

The text of Isaiah in the Book of Mormon is not word for word the same as that of the King James version. Of 433 verses of Isaiah in the Nephite record, Joseph Smith modified about 233. Some of the changes made were slight, others were radical. However, 199 verses were word for word the same as the old English version. We therefore freely admit that Joseph Smith may have used the King James version when he came to the text of Isaiah on the gold plates. As long as the familiar version agreed with the text on the gold plates, he let it pass; when it differed too radically he translated the Nephite version and dictated the necessary changes.

We find confirmation of this view in the comments of Joseph Smith concerning the translation of Malachi 4:6 in the Doctrine and Covenants (D & C 128:18): "I might have rendered a plainer translation to this, but it is sufficiently plain to suit my purpose as it stands".

If we were to follow this same procedure when translating the Book of Mormon from English into German, we would follow a familiar German version of Isaiah when it agreed with the English text. Where it differed radically from the English, we would translate the English text directly. The familiar German text would most likely be the edition of Luther available at the time of the translation. The significant editions of Luther's translation are: 1545, 1883 (Probebibel), 1914, 1956 (NT), 1964 (OT), 1975 (NT). Over the years, the German Book of Mormon has also undergone several editions: 1852, 1873, 1893, 1902, 1924, 1966 and 1980. Let us now turn to an examination of the texts in these translations in an attempt to determine, if possible, what model was used as a basis for the Isaiah passages.

One of the first things to catch the reader's eye is the form of the name of the Old Testament prophet. In the first two editions (1852 and 1873) we have Jesaja in the nominative and Jesaja's (with an apostrophe) in the genitive. (The older chapter and verse divisions in the editions of 1852, 1873 and 1893 make finding material difficult.) The nominative form
in the first two editions seems to be based on the Greek form found in the LXX (Esaias). The genitive form with the apostrophe seems based on an English possessive. There is some difference in tradition as to what the title of the book written by Isaiah should be. Some call it simply "The Prophet Isaiah" and others call it "The Book of Isaiah". In the first case, the proper name would be an appositive and in the nominative case. In the latter, the proper name would be in the genitive. Other German translations which have a form based on the LXX and could have served as a model for the form of the proper name Isaiah in the first two editions of the Book or Mormon in German are: Piscator (1697), Brentano (1792) and Van Ess (1807). The latinized form of the Greek (Esaias) appears in the Vulgate (Isaias) and the following (mostly Catholic) translations: Ulenberg (1630), Rosalino (1781), Römisch-Catholische Bibel (1782) and Braun (1788).

There are two considerations that might have some bearing on why the German form of Isaiah has some resemblance to the LXX-Vulgate version. The first is that the German and French texts were dealt with at the same time by the same people and the English and French texts were used as a starting point for the German. In a letter from John Taylor to Brother Veit(t), dated 15 July 1851, we read: "Bro Bolton will almost immediately have out the first form of the French translation you can get a copy of that from him & with the French and English you will be enabled to translate pretty near correct and if it is not quite correct I should expect the errors would be so few that the corrections could be interlined." The French and German versions were "so arranged that the French and German pages would face each other, each page containing the same matter in the same opening, thus admitting of their being bound together in one volume" (B. H. Roberts, Comprehensive History of the Church, III, p. 345). The second consideration is that one of those who helped with the translation was "a German school teacher, Elder Viet(t), who was converted in Paris." (G. W. Scharffs, Mormonism in Germany, p. 7) Until recently, I was convinced that this was only a plan that never materialized. I recently became aware that there is a copy of the dual language edition in the church historian's office in Salt Lake City. The majority of the copies available in the historical department and elsewhere in both German and French were printed separately, in fact there were paperback editions in both French and German. We know that the French portion was printed in 1852 in Paris. The address on the title page is Rue de Paradis-Poissonniere, 37 which was the address at which Curtis Bolton resided. It was probably printed at rue Saint-Benoit, 7, the address of the Imprimerie du Marc Ducloix et companie listed on the back of the wrappers of the paperback French edition. John Taylor and Curtis E. Bolton are listed as translators. The German edition was printed in Hamburg in 1852 by F. H. Nestler and Melle. John Taylor and G. Parker Dykes are listed as the translators. It is the best guess of Donald Schmidt, the librarian of the historical department, that the German and French texts were set separately and then one was printed on the opposite side of the other. A note by the publisher of the German edition of the Book of Mormon explains why the German text begins on the left instead of on the right side: "so that it will be opposite the French text, and so that both can be bound in one volume, if necessary (erforderlichen Falls)." This can only be done
if there is exactly the same number of pages in each edition. The separate editions each have exactly 519 pages. Examination also shows consistency on each page for chapter and verse throughout. Since the French version was completed first, I would guess that it was also printed first and then the German was printed on the reverse side of the sheets containing the French translation. The separate editions (hard bound and paperback) of both the French and the German could have been printed at the same time as the sheets of the dual language edition, especially since all have the date 1852. If these assumptions are true the editions would have appeared in the following sequence: 1) French paperback and sheets for French portion on dual language edition, 2) German paperback and printing on the back of the sheets of the French version. These considerations give at least some help in explaining the fact that the first edition of the Book of Mormon was influenced by a French version following the latinized Greek form of the Vulgate. The Luther edition of 1545 has Jesaia without the -s. The Probebibel (1893) and all editions of Luther thereafter (for the Old Testament 1914 and 1964) have changed the i to a j and now have Jesaja as all modern translations do. What is surprising is the fact that the first edition followed the LXX-Vulgate tradition and not Luther as we had anticipated at the outset. The 1893 and 1902 editions have Jesaia (in agreement with Luther) in the text but the title of the book in parentheses at the beginning of the chapter has the LXX-Vulgate form with -s (Jesaias). Beginning in 1924 and thereafter all editions of the Book of Mormon have Jesaja throughout and consequently are now consistent with all modern bible translations. In summary, we can say that with respect to the form of the name Isaiah, the translators of the Book of Mormon into German did not initially use Luther's form, but later did. The genitive form based on the English possessive was abandoned after 1873. By 1924, the modernized form used by Luther wins out and becomes standard.

Listed below are several other features which occur in the first two editions of the Book of Mormon which are clearly not based on Luther and which eventually (by 1924) give way to the traditional form of the Luther text.

1) the spelling and form of proper names Jesaias, Damascus

2) the use of the apostrophe for the genitive (Jesaia's) and to indicate elision (in's, an's)

3) strange spellings (Brod, tödten, erndten, Loos, Schaafe, Heerde, Rathschlag, verläugnen)

4) the capitalization of pronouns (Dir, Einige, Niemand, Jemand)

These features show occasional resemblences to particular translations but nothing that could be called systematic or pervasive. Once again, the most surprising fact is that they did not follow the familiar text of Luther. A great amount of would-be detective work has failed to produce any convincing model for these features.
Let us now turn to the texts themselves to see if we can determine the models for the Isaiah passages in German. For comparison, we will also include the following modern translations of Isaiah: Buber (1958), die Einheitsübersetzung (1981) and Bibel im heutigen Deutsch (1982).

<table>
<thead>
<tr>
<th>Text</th>
<th>Isaiah 2:9</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>negatives</td>
</tr>
<tr>
<td>English</td>
<td>yes</td>
</tr>
<tr>
<td>1852</td>
<td>yes</td>
</tr>
<tr>
<td>Lu 1545</td>
<td>no</td>
</tr>
<tr>
<td>1893</td>
<td>no</td>
</tr>
<tr>
<td>1902</td>
<td>yes</td>
</tr>
<tr>
<td>Lu 1914</td>
<td>no</td>
</tr>
<tr>
<td>1924</td>
<td>yes</td>
</tr>
<tr>
<td>Lu 1964</td>
<td>no</td>
</tr>
<tr>
<td>1966</td>
<td>yes</td>
</tr>
<tr>
<td>1980</td>
<td>yes</td>
</tr>
<tr>
<td>Buber</td>
<td>no</td>
</tr>
<tr>
<td>Bü</td>
<td>no</td>
</tr>
<tr>
<td>BhD</td>
<td>no</td>
</tr>
</tbody>
</table>

This verse certainly belongs to those which Joseph Smith altered radically. The negative (not) is lacking in the Hebrew, the LXX and the Vulgate. Bible translators generally are not familiar with the fact that a text of parts of Isaiah appears in the Book of Mormon, so we can use this verse as a measure of how closely the translators of the Book of Mormon followed the English text as opposed to a German text. As we see from the comparative listing above, the editions of Luther and the modern translations all lack the negative nicht (A). All of the editions of the Book of Mormon have the negative, except the edition of 1893. There are two notes on the leaf opposite the table of contents in the 1893 edition. The first deals with the versification in the Doctrine and Covenants. The second indicates that quotations from the biblical prophets in the Book of Mormon follow the Luther text, which "was not the case in the old edition." It seems clear that the translator of the 1893 edition followed Luther so closely that he did not notice or chose to overlook the fact that the negative not appeared in the original English text of the Book of Mormon. In the choice of words for mean and great, it is the 1893 and 1902 editions that follow Luther most closely (B and C). The early and later editions follow the English but have different words (early gering-groß, later gemein-groß).
### Isaiah 3:1

<table>
<thead>
<tr>
<th>Text</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>Hosts</td>
<td>sing</td>
</tr>
<tr>
<td>1852</td>
<td>Zebooth</td>
<td>sing</td>
</tr>
<tr>
<td>Lu 1545</td>
<td>Zebooth</td>
<td>plur</td>
</tr>
<tr>
<td>1893</td>
<td>Zebooth</td>
<td>plur</td>
</tr>
<tr>
<td>1902</td>
<td>Zebooth</td>
<td>plur</td>
</tr>
<tr>
<td>Lu 1914</td>
<td>Zebooth</td>
<td>plur</td>
</tr>
<tr>
<td>1924</td>
<td>Heerscharen</td>
<td>plur</td>
</tr>
<tr>
<td>Lu 1964</td>
<td>Zebooth</td>
<td>plur</td>
</tr>
<tr>
<td>1966</td>
<td>Heerscharen</td>
<td>sing</td>
</tr>
<tr>
<td>1980</td>
<td>Heerscharen</td>
<td>sing/plur</td>
</tr>
<tr>
<td>Buber</td>
<td>der Umscharte</td>
<td>sing</td>
</tr>
<tr>
<td>EU</td>
<td>Heere</td>
<td>sing</td>
</tr>
<tr>
<td>BhD</td>
<td>Herr der Welt</td>
<td>plur</td>
</tr>
</tbody>
</table>

In Isaiah 3:1 (D), all editions of the Book of Mormon from 1852 to 1902 agree with Luther in using the Hebrew word Zebooth. Beginning with the 1924 edition and thereafter, the translation of the Hebrew word into German is the only alternative found and this practice agrees with all the modern bible translations (der Umscharte, Heere, Herr der Welt).

### Isaiah 3:2

<table>
<thead>
<tr>
<th>Text</th>
<th>F</th>
<th>G</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>mighty</td>
<td>prudent</td>
<td>ancient</td>
</tr>
<tr>
<td>1852</td>
<td>den Starken</td>
<td>den Klugen</td>
<td>Ältesten</td>
</tr>
<tr>
<td>Lu 1545</td>
<td>Starcke</td>
<td>Warsager</td>
<td>Eltesten</td>
</tr>
<tr>
<td>1893</td>
<td>Starke</td>
<td>Wahrsager</td>
<td>Ältesten</td>
</tr>
<tr>
<td>1902</td>
<td>Starke</td>
<td>Wahrsager</td>
<td>Ältesten</td>
</tr>
<tr>
<td>Lu 1914</td>
<td>Starke</td>
<td>Wahrsager</td>
<td>Älteste</td>
</tr>
<tr>
<td>1924</td>
<td>der mächtige Mann</td>
<td>Kluge</td>
<td>Alte</td>
</tr>
<tr>
<td>Lu 1964</td>
<td>Helden</td>
<td>Wahrsager</td>
<td>Älteste</td>
</tr>
<tr>
<td>1966</td>
<td>der mächtige Mann</td>
<td>Klugen</td>
<td>Alten</td>
</tr>
<tr>
<td>1980</td>
<td>Mächtigen</td>
<td>Besonnenen</td>
<td>Alten</td>
</tr>
<tr>
<td>Buber</td>
<td>Held</td>
<td>Wahrsager</td>
<td>Ältesten</td>
</tr>
<tr>
<td>EU</td>
<td>Helden</td>
<td>Wahrsager</td>
<td>Ältesten</td>
</tr>
<tr>
<td>BhD</td>
<td>Elitetruppen</td>
<td>Wahrsager</td>
<td>Sippenoberhaupter</td>
</tr>
</tbody>
</table>

In verse 2 of chapter three (E), we can say that the editions of 1893, 1902 and 1924 followed Luther with respect to the choice of singular or plural. The early editions (1852 and 1873) and the later editions (1966 and 1980) follow the English. The modern bible translations of the bible are divided almost equally between the singular and the plural. As far as the selection of words corresponding to English ancient is concerned, the editions of 1852, 1893 and 1902 follow Luther (Ältesten), even though confusion arises as to whether reference is being made to a priesthood or civic office or merely to seniority. The editions of 1924,
1966 and 1980 have reduced the confusion by using Alte but may not have conveyed the meaning of the English very successfully (cf. the Sippenoberhäupter in the Bibel im heutigen Deutsch. With respect to the other forms listed in this verse, the same three editions (1852, 1893, and 1902) generally follow Luther (stark) and the same three follow the English (mighty). The 1980 edition is unique in using die Besonnenen to render English prudent. All others, bible and Book of Mormon, have Wahrsager. The essentially different orientation of the 1980 edition will become more apparent as we proceed with the comparison of some additional verses from the 1980 edition with their counterparts in modern bible translations.

In summary of our analysis so far, we can say:

1) that the editions of 1852 and 1873 follow the English source very closely (In other respects they are also virtually identical.)

2) that the editions of 1893 and 1902 follow Luther rather closely, especially the edition of 1893

3) that the 1966 edition increases its dependence on the English text

4) that the 1980 edition follows the English most closely and in so doing becomes most distinctly innovative.

Let us turn now to some verses in the most recent translation of 2 Nephi 12 and 13 (Isaiah 2 and 3) and compare them with some recent bible translations in a search for possible similarities or parallels.

<table>
<thead>
<tr>
<th>Isa 2</th>
<th>Book of Mormon 1980</th>
<th>Buber 1958</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>geschaut hat</td>
<td>empfing</td>
</tr>
<tr>
<td>2</td>
<td>festgegründet stehen zu Häupten der Berge</td>
<td>festgegründet ist ... zu Häupten der Berge</td>
</tr>
<tr>
<td></td>
<td>über die Hügel erhaben</td>
<td>über die Hügel erhaben</td>
</tr>
<tr>
<td>3</td>
<td>zum Haus von Jakobs Gott auf seinen Pfaden</td>
<td>zum Haus von Jakobs Gott auf seinen Pfaden</td>
</tr>
<tr>
<td>11</td>
<td>Hoffartsblöcke</td>
<td>Hoffartsaugen</td>
</tr>
<tr>
<td>19</td>
<td>Felsenhöhlen</td>
<td>die Höhlen der Felsen</td>
</tr>
<tr>
<td>21</td>
<td>die Spalten der Felsen</td>
<td>die Spalten der Felsen</td>
</tr>
<tr>
<td></td>
<td>die zerklüfteten Felsen</td>
<td>die Schlüfte der Schroffen</td>
</tr>
</tbody>
</table>
Isa 3

5 erdreisten wird sich sie erdreisten sich
6 du hast ein Gewand Du hast noch ein Gewand
8 ins Auge zu trotzen ins Auge zu trotzen
10 genießen werden sie die F ... werden die essen
12 Die dich lenken die dich lenken
14 abgeweidet habt ihr abgeweidet habt ihr d Wg
17 mit Grind versehen vergrinden
18 Wegnehmen wird der entfernen wird mein Herr
19 Gehänge Tropfgehänge
   Armspangen Armspangen
   Halstücher Flatterschleier
   Schrittkettlein Schrittkettlein
   Nasenreife Nasenreife
   Pludermantel Pludermantel
   Sackleinenumgürtung Sackleinenumgürtung
   Ihre Pforte klagen Ihre Pforte klagen
   und trauern und trauern

Isaiah 2

Verse 1: Luther is the only one of the eight bibles that has the same 
verb and tense as the 1980 translation of the Book of Mormon (geschaut 
hat). Jerusalem, Zürich, Neue-Weltübersetzung and Bruns have the same 
verb but a different tense (schaute).

Verse 2: The phrase zu Haupten der Berge is found only in Buber and the 

Verse 3: Ignoring the two a's in Buber, the phrase zum Haus von Jakobs 
Gott occurs only in Buber and the 1980 edition. Seven have a genitive 
instead of von and six have the optional dative e (zum Haus(e) des 
Gottes Jakobs). The departure from the usual formulation serves to set 
Buber's paraphrase apart from the others and also to make the relationship 
to the 1980 translation of the Book of Mormon apparent. The plural Pfad 
'paths' is found in six translations.

Verse 11: Where the 1980 edition has Hoffartsblicke, Luther and Bruns 
have the adjective hoffartig. Zürich has a related noun Hoffart. 
Only Buber has a similar but not identical compound, since they share 
only the same first element (Hoffarts-augen) (Cf. KJ 'lofty looks')

Verse 19: Four have Felshöhlen, two have Höhlen der Felsen and only 
one (Zürich) has the precise form of the 1980 edition of the Book of Mormon 
(Felsenhöhlen). The eighth edition of the Book of Mormon (1924) has an 
archaic Saxon genitive der Felsen Höhlen.

Verse 20: Five have Felsspalten but only Buber and the 1980 edition have 
die Spalten der Felsen. None has the participial adjective zerklüftet 
but five have a compound with the final element -klüfte.
Isaiah 3

Verse 5: Only Buber and the 1980 edition have the verb erdreisten 'to have the audacity (to do)'. Note also the fronting of the verb for emphasis, a phenomenon to which we will return later.

Verse 6: Only Buber and the 1980 edition use the elevated word Gewand. The others have more ordinary words like Mantel, Rock, Überwurf.

Verse 8: Three translations (Jerusalem, Einheitsübersetzung and Zürich) use the noun Augen and the verb trotzen, but only Buber and the 1980 edition have exactly the same phrase ins Auge zu trotzen.

Verse 10: The majority use the verb genießen or essen, but only the 1980 edition of the Book of Mormon has the verb in first position (See also verse 5 above).

Verse 12: All of the sources except Buber and the 1980 Book of Mormon use führen or leiten or derived forms. Jerusalem has the same relative clause construction (Die dich leiten) but only Buber and the 1980 edition have the same lexical elements and the same syntactic construction (die dich lenken).

Verse 14: Most use abweiden or plündern in the perfect, but only Buber and the 1980 edition have the past participle in first position. (See also verses 5 and 10). This stylistic device is common in Buber's hebrewizing paraphrases which imitates the Hebrew characteristic of placing the verb first. The verb is not first in the English nor in the traditional German texts, nor in the Hebrew in this verse or verse 10.

Verse 17: There is some similarity in the root which renders English 'smite with a scab.' The 1980 edition of the Book of Mormon has the noun Grind, Buber has the verb vergrinden and the Neue-Welt-Übersetzung has the adjective grindig.

Verse 18: Most of the translations have wegnehmen in agreement with the 1980 edition but only the 1980 edition has the verb in first position in agreement with Buber.

Verse 19: All have Schleier or a compound thereof. The 1980 edition is unique in its choice of Halstücher (cf. KJ and English Book of Mormon mufflers, Modern Language gauze veils, Revised Standard scarfs.)

Verse 20: Buber and the 1980 edition are the only two that have the diminutive ending in -lein (Schrittkettlein) whereas the others all have the diminutive ending -chen (Schrittkettchen or Fußkettchen).

Verse 24: Only Buber has the unique compound Pludernmantel. Most dictionaries have the verb pludern 'to bulge, be baggy' and Pluderhose 'wide baggy trousers taken in at the ankle' but none has this particular compound. It is found only in Buber and the 1980 edition. Some have
Sack, and some have deverbative forms of gürten, but only Buber and the 1980 edition have the identical and unusual, long compound tackle umgür tung (Cf. Eng. a girding of sackcloth).

Verse 26: Zürich, Buber and 1980 have a phrase with the same tense, lexical items and word order (Ihre Pforte klagen und trauern).

Summary of Parallels

A. Buber and the 1980 Book of Mormon (identical)

<table>
<thead>
<tr>
<th>Phrase</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>zu Häupten der Berge</td>
<td>Isa 2:2</td>
</tr>
<tr>
<td>zum Haus von Jakobs Gott</td>
<td>Isa 2:3</td>
</tr>
<tr>
<td>die Spalten der Felsen</td>
<td>Isa 2:21</td>
</tr>
<tr>
<td>erdreisten</td>
<td>Isa 3:5</td>
</tr>
<tr>
<td>Gewand</td>
<td>Isa 3:6</td>
</tr>
<tr>
<td>ins Auge zu trotzen</td>
<td>Isa 3:8</td>
</tr>
<tr>
<td>abgeweidet habt ihr</td>
<td>Isa 3:14</td>
</tr>
<tr>
<td>Schrittkettlein</td>
<td>Isa 3:20</td>
</tr>
<tr>
<td>Pludermantel</td>
<td>Isa 3:24</td>
</tr>
<tr>
<td>Sackleinenumgür tung</td>
<td>Isa 3:24</td>
</tr>
</tbody>
</table>

B. Buber and the 1980 edition of the Book of Mormon (partial)

<table>
<thead>
<tr>
<th>Phrase</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hoffarts-</td>
<td>Isa 2:11</td>
</tr>
</tbody>
</table>

C. The 1980 edition of the Book of Mormon and one other translation

<table>
<thead>
<tr>
<th>Phrase</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>geschaut hat (Luther)</td>
<td>Isa 2:1</td>
</tr>
<tr>
<td>Felsenhöhlen (Zürich)</td>
<td>Isa 2:19</td>
</tr>
</tbody>
</table>

D. The 1980 edition of the Book of Mormon and two others

<table>
<thead>
<tr>
<th>Phrase</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>ihre Tore klagen und trauern (Buber, Zürich)</td>
<td>Isa 3:26</td>
</tr>
</tbody>
</table>

E. The 1980 edition of the Book of Mormon only

<table>
<thead>
<tr>
<th>Phrase</th>
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</tr>
</thead>
<tbody>
<tr>
<td>two verbs in first position</td>
<td></td>
</tr>
<tr>
<td>erdreisten</td>
<td>Isa 3:5</td>
</tr>
<tr>
<td>genießen</td>
<td>Isa 3:10</td>
</tr>
</tbody>
</table>
At the outset, we postulated that the translators of the German Book of Mormon would follow the precedent set by Joseph Smith in his use of the King James version in his translation of the Book of Mormon from the gold plates. Instead, we found that the early editions followed the English even to the point of imitating the English possessive with an apostrophe. The editions inbetween, (especially that of 1893) increasingly followed Luther, even to the extent of omitting a negative in the English original. The most recent translation of the Book of Mormon into German follows the English very closely, but when it departs it does not follow the traditional Luther text but has very strong affinities with the hebrewizing paraphrases of Martin Buber. It replaces the somewhat English flavored overlay of the early editions with a Hebrew one.

The Book of Mormon quotes from the following chapters of Isaiah: 2-14 (2 Nephi 12-24); 29 (2 Nephi 27); 48, 49 (1 Nephi 20, 21); 50, 51 (2 Nephi 7, 8); 52 (3 Nephi 20); 53 Mosiah 14); 54 (3 Nephi 22); 55 (2 Nephi 26:25).
Gothic is the chief known language of the Eastern branch of the Germanic languages. This latter group itself is one of about twelve main dialects of Indo-European. The Gothic with which we are familiar dates from the fourth century A.D. and was spoken by a group of Goths living in and around the area covered by modern day Romania. They had migrated there, according to their native historian, Jordanes, who wrote in the middle of the 6th century A.D., from their earlier homeland which comprised Southern Scandinavia, the Baltic coast of modern Germany and Poland, and the islands between. These Goths had by the 4th century been converted to the Arian sect of Christianity. Their bishop and chief religious figure was Wulfila. The exact date of his Bible translation is uncertain, but it was in any case completed before his death in A.D. 381.

Some time after Wulfila's death the Goths were pushed westward by the Huns and other eastern invaders. This chaotic era in European history, the Völkerwanderungszzeit or age of tribal migrations saw the sacking of Rome in 410 by the Visigoths, who later moved still further west to Spain where they were important until the Moslem conquest. The East Goths, with whom we are more particularly concerned, established a kingdom in Italy in 439. The manuscripts of the Gothic Bible translation which have survived to our day, comprising about one half the New Testament and several chapters of the Old Testament, are copies of Wulfila's original made in Italy around 500 A.D.

The literary remains of Gothic are thus both considerable and of early date. In fact, the only other Germanic linguistic evidence of equal or greater antiquity is scanty indeed when compared to Gothic. A helmet has been discovered with the two-word Runic inscription harigasti teiwai, probably 'to the god Harigast', and dating from the second or third century B.C. These two words convey a surprising amount of evidence to the scholar of early Germanic, but one might nevertheless wish for somewhat more extended material. Another, more famous inscription on a golden drinking horn from Denmark reads ek hlewagastir.
holtingaR horna tawido. 'I Hlewegaust of the Holtings made the horn.' This inscription, showing certain traits of North Germanic, the ancestor of the modern Scandinavian languages, was made very near the time when Wulfila was translating the Bible into Gothic at the other end of Europe. Although it too provides much of interest, and is in some ways more archaic than the Gothic of Wulfila's translation, it is almost as laconic as the first example.

It is not until five centuries later that literary documents of any considerable size emerged in the other Germanic languages -- at least documents which have been preserved to modern times. Along with the familiar secular texts such as the Old English Beowulf, the Old High German Hildebrandslied and Ludwigslied and the Old Norse saga literature dating from several centuries later, there is also a fair amount of material comparable to Wulfila's New Testament translation. The Old High German Heliand, for example, is essentially a retelling of the Bible story in an epic-Germanic style comparable to Beowulf: it uses the alliterative verse form with four accents per line and each line divided into two halves, a verse form known in German as Stabreim. The Old Saxon Genesis is a similar account in a language close to Old English. There are also several literal translations, such as the Old High German Tatian.

The source of all of these translations and reworkings was the Latin Vulgate Bible. Thus they were to begin with one step further removed from the text of the New Testament than Wulfila's translation, for Wulfila translated the New Testament into Gothic from Greek manuscripts, and in fact from fairly early sources. The same cannot be said of the Old Testament; it was not translated from a Hebrew original, but instead from a Latin translation. Although the later translations all relied on the Vulgate, Wulfila almost certainly did not use the Hebrew text, and may have relied quite heavily on an earlier Latin version of the Old Testament, the Vetus Latinus -- Jerome's Vulgate was still to be written in Wulfila's day. He may also have used the Septuagint. It is more difficult to determine the source of the Old Testament as only about three pages of it survive.

Furthermore, one may safely say that Wulfila's skill as a translator surpassed that of any of the later archaic Germanic translators. He is rather to be compared with the tradition of the other early translations of the Bible, Syriac, Coptic and Pre-Vulgate Latin. In fact, it is surprising to note that these are the only translations of the New Testament to precede Wulfila. The Vulgate, Ethiopic, Armenian and Old Church Slavonic follow Wulfila's translation by from 100 to 500 years.

How did such a literary and scholarly masterpiece come to be written among the Goths? It should be noted that
Wulfila's ancestry was mixed. He was probably half Goth and half Cappadocian; his Greek-speaking and Christian grandfather had been taken prisoner by the Goths fifty years before his birth. His training in the church which led to his position as bishop of course made him thoroughly fluent in the Greek language and no doubt well acquainted with Greek learning.

Scholars believe they have identified the manuscript tradition underlying Wulfila's translation. The text he is believed to have used is a manuscript known as the Antiochene-Byzantine recension of Lucian the Martyr. In terms of the New Testament Apparatus familiar to readers of standard Greek New Testaments, the Gothic translation most often follows the traditions reflected by Manuscripts D and K. (Its composition precedes the redaction of both of these manuscripts.)

Wulfila's translation is thus of very great interest simply as a New Testament manuscript. It is one of the first translations of the New Testament, the translation itself is as skillful and as great a literary achievement as the other translation of that time or for a thousand years to come, and it is older than many manuscripts considered invaluable in establishing the original text of the New Testament. Its chief value however has usually been seen in another of its aspects, one to which we have already alluded, and that is that it is by far the largest body of evidence for early Germanic currently known to us, preceding the other early Germanic documents mentioned above by 500 years or more.

Since Gothic occupies such an eminent position in the corpus of early Germanic materials, the question naturally arises, what is the precise nature of the linguistic evidence it affords, and to what extent is it a reliable reflection of early Germanic? We shall briefly consider this problem as it applies to several major linguistic areas: syntax, morphology, including paradigmatic formations, and lexicology, examining in each case to what extent the Gothic materials are reflective of Gothic or of early Germanic (not necessarily the same thing), to what extent they are derivative of the Greek Vorlage or underlying text, and to what extent Wulfila himself was innovative.

Syntax

The most obvious aspect of Wulfila's translation for the considerations at hand is its syntax. There are many ways in which the translation departs from typical early Germanic syntactic patterns, at the same time following a typically Greek syntactic pattern, thus allowing us to conclude that the text reflects the structure of its Vorlage more closely than that of standard Gothic of the period. We shall consider two such cases. A third case is more difficult to determine
and may in fact reflect a Gothic reflex of an early Germanic construction which was lost by the other Germanic languages but was also shared in common with Greek.

Greek is a language very rich in particles. Although the Germanic languages are also somewhat fond of particles, Gothic uses sentence particles much more often than one would expect (in comparison to Old High German, Old English or Old Norse) and these particles almost always match a Greek particle, often matching its very idiomatic position in the sentence. Thus Greek ἀλλά is usually translated by ak or akei (John 14:31, 15:25; 16: 4, 6, 7). The Gothic word, like the Greek, is inevitably sentence or clause initial. Gothic ἵπ may represent Greek Δή or Δέ. In either case the Greek word is never sentence-initial, whereas the Gothic ἵπ is always sentence or clause initial. (John 7: 10, 14, 31, 37; 12:3, 17:13; ). The Greek verse initial καὶ, 'and', on the other hand, which is itself generally of Semitic origin in the Greek New Testament is always jah.

If Gothic shows an overabundance of particles, it uses less of another typical Germanic construction, the Verb plus adverb, often with a redundant verbal prefix. This expression is particularly marked in North Germanic, in such common expressions as ganga ut 'to go out' or, with redundant verbal prefix utganga ut. In addition, many common verbs can be combined with adverbs to form new semantic complexes, with the meaning not always predictable from the components. The same is true of both Old and Modern English. We could name hundreds of expressions such as go out, turn back, get up, as well as others with altered meanings such as turn into or come around (two meanings each). Modern German also uses many such expressions, often with the redundant (separable) verb particle: aus dem Haus hinaus 'out of the house'; mit mir mitkommen 'come with me'.

It is apparent that Gothic had such expressions, for they do occur, as at Math 26:75 jah usaggangds ut gaigrot baitraba 'And going out, he wept bitterly'. This construction is only used, however, when the Greek uses an identical construction, as it does here: ἔξεκαλθων ἐκώ. This construction is however much less common in Greek than in the Germanic languages, and so what we usually find in the Gothic New Testament is an expression of the type adverb plus verb for Greek verbal prefix plus verb. Thus Inn aggagaib baibr aggvu dár 'Go in through the narrow door' (for Greek ἐσκαλθαὶ ἀπὸ ταε). Biblical Gothic even allows particles and adverbs to pile up before the verb as in mit ἀνακυμβδεδυ 'they sat down with' Math. 9:10. Here again the word is an exact imitation of Greek, even to the point of attempting to equate prefixes in the two languages-- the Greek is συνανακείντο.

The syntax of the participle in Gothic also shows heavy reliance on Greek, perhaps with one interesting exception.
Expressions of the type participle plus main verb are frequently used in Greek to describe two closely related actions, for example 'He stopped and looked', 'he got up and returned'. Germanic languages use two finite verbs in these examples where Greek would use a participle and a main verb 'having stopped, he looked', 'getting up, he returned'. In Gothic, however, expressions of the Greek type abound: *Imands gahaflja ina* 'I will come and heal him' (Math 8:7) *Jan atateigands in skip ufarlaif* 'And entering the ship he crossed over' In each case, the Greek original has a participle plus a verb.

A more idiomatic use of the participle in Greek is the Genitive Absolute. A participle is declined in the genitive case, a nominal phrase agrees with it in case, and it modifies the sentence from an absolute point of reference, usually with a meaning of time, manner, cause, condition, etc. This expression, virtually lacking in the Germanic languages, is frequent in Gothic, but usually as a Dative Absolute, occasionally as an Accusative Absolute, never as a Genitive. An example is at Math. 8:10 *At andanahtia ban vaurbanamma* 'And when it was night' (for Greek 'Οψαλμας δὲ ηνεκμίνης). Is the Gothic Dative Absolute a non-native construction derived from Greek or is it a Germanic construction which Gothic alone maintained, and which Wulfila used to translate the Greek Genitive Absolute? The fact that the expression is dative, not genitive argues that it may have been native Germanic, although perhaps archaic even to Wulfila, for why would he have chosen a different case if he were simply imitating a Greek expression?

Morphology

The origin of the Gothic alphabet has been widely discussed. For our purposes, we may simply note several difficulties involved in reconstructing the primitive Germanic phonemic system on the basis of Gothic evidence. The proto Germanic diphthong *ei*, from Indo-European *ei* was lost very early in Germanic dialects, merging with long *i*. In the early runic inscriptions above, Germanic *ei* remains, but it has become *i* in Old High German, Old English, and Old Norse. Gothic uses *ei* in words reflecting Germanic, but we cannot conclude that the phoneme was retained by Gothic.

The Greek diphthong had come to be pronounced */iː:/ by koine times, the pronunciation it has in modern Greek. Thus to Wulfila, familiar with the Greek pronunciation of his day, the natural way to represent */iː:/ was with the letters *ei*. Ample evidence for this view is seen in the representation of Biblical names in Gothic. David, for example is spelled in Gothic *Daveid*, even though the koine spelling is usually *Δαυις*.

100
The grammatical paradigms of Gothic are the aspect of the language which is least likely to be affected in a translation from a Greek original. There is in fact little or no Greek influence on grammatical forms. Several archaic features of the Gothic paradigm system might nevertheless be mentioned quickly. The verbs of the seventh strong class in Gothic, for example are reflective of an earlier stage of Germanic than are the corresponding verbs in the West and North Germanic languages. Gothic tends to form the preterite of these verbs by means of reduplication, whereas the other Germanic languages, while retaining traces of this much earlier tense formation, use ablaut as in the other six classes. Thus beside Gothic hainait 'he called', from haftan, Old English and Old High German have het and hiaz, and Old Norse hét.

Gothic is also somewhat less fixed in its usage of weak and strong adjectival declensions than are the other early Germanic dialects. This twofold adjectival declension system is a Germanic innovation, and Gothic may perhaps reflect an earlier stage of Germanic during which time the later pattern was not yet fully established. In addition, Gothic retains some verbal uses not found in other Germanic languages, such as what is apparently a reflex of the Indo-European subjunctive seen in ni ogs, 'fear not' (what is commonly called subjunctive in Gothic is the Indo-European optative). The deliberative subjunctives occasionally found, on the other hand, such as by is sa gij'manda anbarizuh beidaifma? 'Are you the one who is to come, or shall we await another?' -- are almost surely copied from Greek usage.

Lexicology

Wulfila shows greatest innovation in the area of lexicology, that is in his selection of existing and invention of new Gothic words to render those of the Greek text. Although koine Greek is much more restricted in its vocabulary than classical Greek, its range of words was clearly much larger than Gothic. Wulfila was thus often forced to coin words. These words are often straightforward calques or translations of the Greek. For ἐπισκέπτης 'false prophet' (Math. 7:15) Wulfila has liugnapraufetus and elsewhere galiugapräufetus. 'Do not be wordy' (Greek μὴ βαττέλεως σῆμερα in Math 6:7 is ni filuvaurdjaip. Even where Greek does not use a compound word, the Gothic may tend to express a syntactic complex in a single word, reminiscent of the compounding tendencies of later Germanic languages, especially German. Thus although 'pure in heart' is expressed by two nouns in Greek, καθαροὶ τῇ καρδίᾳ, with the second noun a dative of respect, Gothic has a compound noun, hraiñjahrītans, and this in spite of the fact that Wulfila felt no difficulty with the dative of respect construction elsewhere-- although the parallel 'poor in spirit' is lost.
from this particular passage in Matthew 5 (the chapter begins in Gothic with verse 8), the corresponding Lucan passage is intact, and here Wulfila uses unledans ahmin, with spirit, ahma in the dative case, for poor in spirit.

Occasionally an idiomatic expression is obviously carried over from Greek into Gothic. For example the common Greek idiom of adverb plus ἐκ( (the verb to have) to express what we would say in English with 'to be' plus predicate adjective, as in 'be sick', is literally translated from Greek into Gothic. Thus at Math. 9:12, Ni ḟəurbun haflai lekeis, ak ḫaf unhaflı habandans 'the well do not need a doctor, but the sick'.

Wulfila interestingly avoids one literalism which some other early translations do not. The notion conveyed by English put was often expressed in koine Greek with the verb ἔθησα. The familiar passage in Matthew 9 which speaks of putting new wine in old bottles, or, rather wineskins, is in Greek οὔτε βάλλομεν ὅταν νῦν εἰς ἄσκοπος παλαιοῦμεν, literally 'throw'. Wulfila here uses an entirely different word giuland 'pour'. When the same Greek word is used in the next chapter for 'think not that I have come to bring peace to earth' (οὐκ ἠλπισεν βαλέσω εἰρήνην). Gothic uses yet another word, lagian 'lay, put'. In the Coptic translation of the New Testament, on the other hand, made about 100–150 years before the Gothic, Greek βάλλω is invariable translated with ΝΟΥΔΕ (nouje) which means quite literally in Coptic 'to throw'.

In conclusion, Wulfila's fourth century Bible translation is remarkable, first simply as a translation. It is one of the earliest, it is on a par linguistically and stylistically with those that preceded it, and far in advance of anything like it in the Germanic world. The syntax of the translation shows heavy influence of Greek, but this is not at all unusual for scriptural translation at that time, or indeed for the next 1250 years until the time when Martin Luther would ask in dismay before a verse rendered too literally from the Vulgate "Ist das deutsch geredet?" The grammar and morphology of Gothic are archaic, perhaps not so much as some have believed, but because it is so early and of such quantity, it is probably the most important of the early Germanic dialects in determining the characteristics of proto-Germanic. It does contain gramatical features found nowhere else among the Germanic languages. Lexically, Wulfila was at times highly innovative, and less slavish in his renderings than other biblical translations of the time. Wulfila's Bible translation is fascinating both to the student of the history of biblical texts and to the scholar of early Germanic.
FOOTNOTES

1. Our present Greek text has only πτωχός 'poor' in Luke 6:20. Wulfila's text may have read πτωχός τῷ πνεῦματι, or he may have supplied 'spirit' on the analogy of Matthew 5.

2. Although this type of construction is not unknown in Germanic languages (cf. for example modern German. Er hat es eilig 'He is in a hurry'. The word for word correspondence with the Greek of the text in question make it very likely that we are dealing here with a forced, literal translation.
In the past few decades, a great deal of emphasis has been placed on language acquisition theory and research. A wide variety of theories have arisen, the two principal viewpoints being nativist and behaviorist. Research in the field has been conducted at the very least with these theories in mind, and usually with the intent to support or disprove them.

This paper will briefly outline some of the major theories and research in the field, then present a new theory and discuss its merits and implications.

Since 1957, when Chomsky published *Syntactic Structures*, language acquisition studies have taken a new direction. Chomsky's claim is that children are born with a specific innate language-learning capacity, and that they learn language by setting up hypothetical rules of grammar and matching these rules against what they hear. They eventually deduce the correct rules and speak grammatically. Thus, as the child is developing in language, he will acquire the simpler rules first, because those will be easiest to deduce. Two arguments Chomsky used to support his theory are: 1) language is too complex to be learned so quickly without some sort of innate mechanism to help the child make the correct hypotheses; and 2) adult speech is such a mess—we speak in sentence fragments, change subjects in the middle of a sentence, etc.—that it would be nearly impossible for a child to deduce any consistent rules based on such degenerate input.

Many linguists designed studies intended to support Chomsky's theory. Others, who espoused a more environmentalist or behaviorist point of view, set out to disprove it.

Roger Brown attempted to determine the order of acquisition of grammatical features in children. Brown immediately ran into problems: he found that children do not acquire features in a straightforward manner, as Chomsky's idealization of "instantaneous acquisition" would suggest. They do not instantly acquire a grammatical feature overnight, nor do they gradually and steadily improve until they have acquired it. Rather, they vacillate back and forth between a high and low percentage of correct usage, then finally they level off at or near 100 percent correct usage in appropriate situations. Brown resolved the problem by setting an arbitrary standard. If the feature is used 90 percent of the time in obligatory contexts, it has been, by Brown's standard, acquired. Thus he was able to list the order of acquisition of grammatical features.

He found the order to be more or less universal (at least for his sample of three children), but he also found it difficult to determine whether simpler rules were acquired first. The reason is that it is difficult
to determine the criteria which define grammatical simplicity or complexity. Grammatical complexity alone (based on Chomskian theory—number of optional transformations in the derivation determines the relative complexity of it) did not determine the order of acquisition. Yet Brown still felt that grammatical complexity must be an important determinant of the order of acquisition. He believed that modifications of the criteria which define grammatical complexity on Chomsky's grammar are required before the relationship between grammatical complexity and order of acquisition can be revealed. He does not, for example, "simply count the number of optional transformations in a derivation, or any other feature of a derivation, since this procedure involves the generally unwarranted assumption that any one transformation, or some other feature, involves the same increment to complexity of knowledge as any other . . . we are not prepared to assume equality of units." Brown believes that other factors, such as semantic complexity, frequency (number of times adults use a feature when talking to the children), and perceptual salience (phonetic substance, stress level, usual serial position in a sentence, etc.) also play a determining role.

In 1970, he researched the influence that caretakers have in children's acquisition of morphemes. He found that parents not only do not correct errors in verb forms, plurals, etc., but in fact, they pay little or no attention to grammatical errors. His conclusion was that it is the "truth value rather than syntactic well-formedness that chiefly governs explicit verbal reinforcement by parents." Brown's next step was to determine if there be a high correlation between the frequency with which parents use the forms and the order in which they are acquired (Brown 1973). He found a very low correlation. Thus he concludes that although "a marginal role for frequency is guaranteed [because] children cannot learn what they never hear, . . . there is no evidence whatever that frequency of any sort is a significant determinant of order of acquisition." Although Brown's research concerning perceptual salience has been much less extensive, he maintains that "as in the case of frequency, some role for salience is guaranteed; the child will not learn what he cannot hear." Semantic and grammatical complexity, then, are what Brown considers to be the major determinants, while the other two (frequency and salience) play a more minor role in determining the order of acquisition.

Brown's research has had a large impact on acquisition theory. For instance, behaviorists such as Staats (who believe that children learn language in the same way any other behavior is learned—through classical conditioning principles) have, in light of Brown's data, had trouble demonstrating that children imitate adult speech patterns.

Other research which has been conducted with Chomskian theory in mind concerns caretaker speech, or "motherese." This has been studied extensively, and the consensus is that the input children receive is far from degenerate. Snow (1979) states: "Chomsky's position regarding the unimportance of the linguistic input was unproven, since all children receive a simplified, well-formed, and redundant corpus." Some
researchers (e.g., Furrow, Nelson and Benedict, 1978) have found correlations between caretaker speech and the output of children. It was discovered that caretakers simplify their speech to a level just higher than that of their children (L + 1). Some (Bruner, 1979) believe that this correlation can be interpreted as a cause-effect relationship, and that "parents teach their children to speak." In light of Brown's data, however, and also in light of the fact that even when corrected, children seem to hear adults' speech in their own terms of understanding, rather than the particular grammatical form used by their parents, it is not clear to what extent a cause-effect relationship can be inferred from the correlations found by Furrow, Nelson and Benedict.

As time has passed, it has become more and more clear that at least some of Chomsky's basic assumptions are incorrect. Though few researchers would say that there is no innate mechanism to aid in language learning, most have begun to downplay innate mechanism, as if because Chomsky's specific representation of acquisition was inaccurate, then any nativist viewpoint must be on the wrong track. Halliday (1975), however, points out that

There seems to be no necessary connection between these [nativist and environmentalist representations of language acquisition] as general positions and the particular models of the processes involved in the learning of linguistic structure that have been most closely associated with them. The nativist view lays more stress on a specific innate language-learning capacity; it does not follow from this that the child necessarily learns by setting up hypothetical rules of grammar..., but there has been a widely-held interpretation along these lines. Environmentalist views, by contrast, emphasize the aspect of language learning that relates to other learning tasks, and stress its dependence on environmental conditions; again, this is often assumed to imply an associationist, stimulus-response model of the learning process, although there is no essential connection between the two.10

The emphasis on the acquisition of syntax which has been associated with the Chomskian era has also faded, and recent studies show increasing interest in other facets of language such as phonology, semantics, and pragmatics, studied from many different angles.

Halliday, for instance, recognizes the sociological factors related to language acquisition. He takes a "functional" approach to language learning. He sees the learning of language as a process of interaction between the child and other human beings. As the child develops, the definition of "function" changes to meet that of the adult world. Halliday describes all of the child's stages in language development (from no grammar at all to highly advanced and abstract adult language) in terms of function. He goes so far as to conclude that language occupies the "central role in the processes of social learning."11

Eve Clark's study of semantics has also had a large impact on acquisition theory in recent years. Her interest is in how words are used to refer to or represent external objects or events appropriately. This differs somewhat from the approach of Slobin and Brown, who concentrate
on "semantic functions" of words in utterances. Clark's theory, which she calls the Semantic Features Hypothesis, is that when a child first begins to use identifiable words, he does not know their full (adult) meaning: "He only has partial entries for them in his lexicon, such that these partial entries correspond in some way to some of the features or components of meaning that would be present in the entries for the same words in the adult lexicon." Clark's theory is clear and she presents it well. But she herself admits that it does not answer the main question of semantics. Her theory assumes that "the meanings of words can be broken down into some combination of units of meaning smaller than that represented by the word. She calls these units features. The main question in semantics, according to Clark, is: "What is a feature? And its corollary: Does the child use the same features as the adult? In an ideal world where we knew what the universal semantic primitives were, we could assume these would be used by both child and adult. However, we are not in a position at present, theoretically or empirically, to (a) identify the set of universal semantic primitives postulated by Postal and Beirwisch, or (b) claim that these primitives are what the child uses when he first attaches some meaning to a word." Clearly, a great deal remains to be done in the field of semantics.

Since language acquisition has been studied from most every perspective in recent years (social, cognitive, psychological, etc.), many "acquisition strategies" have been identified. (Acquisition strategies are social or cognitive methods the child uses to decipher his environment.) Each perspective has uncovered different strategies, and it appears that the child could use all of these strategies as he attempts to learn language.

Certainly the field of language acquisition has advanced in many areas over the past 25 years. No acquisitionist would say that all the questions concerning child language development have been answered, but most in the field believe it has progressed. As Moskowitz puts it, "In general a great deal of progress has been made in understanding child language ... the study of language acquisition has come of age." There is at least one linguist, however, who does not totally agree with this viewpoint. Derek Bickerton, the author of Roots of Language (1981) feels that acquisitionists have been sidetracked and are still missing the point. This section will present Bickerton's reasoning and point out the problems he finds with recent acquisition studies.

Bickerton's viewpoint stems from his thorough study of creole languages. Creoles are languages created by the first generation of pidgin speakers. (Pidgin languages are contact-languages, native to none of the speakers.
Their existence stems back to European colonial expansion. Large masses of non-European laborers, drawn from many different language groups, were brought together to work as slaves under the ruling European minority. A contact vocabulary developed among them, usually because they found it necessary to communicate as they worked. Each speaker would set the pidgin vocabulary to the syntax of his own native language. This allowed sufficient communication for them to work together, but by no means could the pidgin compare in communicative capacity to their native languages.

The children of these pidgin-speakers, growing up in an environment in which the linguistic input was ill-formed and incomplete, actually invented a language which was as adequate for communication as any natural language. Bickerton has made the remarkable discovery that creole languages consist of many syntactic structures which are not found in any of the languages to which the children were exposed. And, even more remarkably, creole languages throughout the world are very similar to one another structurally. Bickerton believes that these similarities among creole languages can only be explained by some kind of innate blueprint for language possessed by all human beings. He calls this the language bioprogram. He also reasons that: "If it is the case that the creole child's capacity to create language is due to such a bioprogram, then . . . it would be absurd to suppose that this bioprogram functions only in the rare and unnatural circumstances [like those of the first generation creole speakers] in which the normal cultural transmission of language breaks down. Forces that are under genetic control simply cannot be turned off and on in this way." His bioprogram theory, if accurate, must then apply to language acquisition under normal circumstances as well as in the creole situation. Thus, according to the theory, by studying the syntax of creole languages we can determine the characteristics of the innate bioprogram languages.

Since we have already noted a tendency to relate all innatist viewpoints to Chomsky's specific theory, it is imperative that at this point we discuss the major differences between the two theories. First, the child is not supposed to "know" the bioprogram language from birth, "any more than we would suppose that a child at birth, or even at six months, 'knows' how to walk." The bioprogram language unfolds in preprogrammed sequences, just as the physical bioprogram unfolds in stages. If a feature of the bioprogram were similar to a feature of the target language, then it would follow that that feature would be learned more quickly, earlier, and with little effort. If, on the other hand, a feature of the target language differed greatly from the bioprogram, the child would simply speak the bioprogram and ignore the data presented by the target language until he was ready to handle it. In such a case, Bickerton predicts that the child would produce "common or even systematic errors" in his speech. Bickerton's theory precisely specifies a particular potential language which, as we will see later, is helpful when one attempts to design research to test the theory. But before investigating the research implied by the bioprogram theory, let us first look at the major objections Bickerton raises concerning present acquisition theory.
First, of course, he refutes the idea that mothers teach their children to speak. This view is based on the assumption that all children "receive a simplified, well-formed and redundant corpus" of data from their mothers, which is simply not true. First generation creole children do not receive such input, yet they still learn language. It would be impossible, in fact, for their parents to have taught them the language, since it previously did not exist; the parents (pidgin speakers) and children (creole speakers) share the same vocabulary, but their syntax is not the same.

Bickerton concedes that "if mother did not teach her child English, that child might have a much harder time learning it . . . the child might never acquire a perfected form of the language." The point is, however, that we will get no closer to understanding how children learn language if we continue to believe that language acquisition requires motherese-type input. "Just as the child does not need mother in order to learn, so he could not learn even with a myriad of mothers if he did not have the genetic program that alone enables him to take advantage of her teaching." Thus he believes that studies drawing parallels between caretaker speech and children's acquisition of syntax (such as Furrow, Nelson and Benedict, 1975) are interesting, but they do not concentrate on the central issue. That is, although caretaker speech undoubtedly influences child language acquisition, it is not essential to the learning of language.

Every complaint Bickerton has with acquisition theories and research is related to this very problem: they are not answering the most important and fundamental question. He explains:

In the absence of the insights provided by creolization, the current paradigm has provided us with much information that we lacked before—on the nature of input to the child and of child-caregiver routines, and the kind of social appropriateness summed up under Hymes's concept of "communicative competence"; on acquisition strategies based on contextualization, semantic and pragmatic clues to the function of novel structures, etc., etc.—and yet, as more and more thoughtful scholars are realizing, the gathering of this information has merely served to conceal the fact that the central question of acquisition, the question with which the early generativists did at least struggle, however unsuccessfully, is simply not being answered:

How can the child acquire syntactic and semantic patterns of great arbitrariness and complexity in such a way that they can be used creatively without making errors?18

Let us at this point make it clear that Bickerton in no way denies the importance of the above-mentioned findings. His is an evolutionary theory. The bioprogram is an adaptive evolutionary device. No such device would force a species into dependence upon it and it alone. "Learning strategies and problem-solving routines which are applicable to a range of situations also apply to language." In Bickerton's view, these routines interact with the innate language component. His point is that these strategies and routines have received "far more than
equal time in acquisition research, and that the "time of hard-core syntax and semantics is here."19

It is clear that acquisitionists have indeed not been addressing Bickerton's central question. They have, in fact, been answering most every question except this one.

Roger Brown, for instance, set out to determine the order of acquisition of features, presumably to see whether or not, as Chomsky suggests, simpler features are acquired first. But when he realized that children do not acquire features in a straightforward fashion, but rather, that they alternate and zigzag up and down the graph until they finally level off at or near the 100 per cent mark, Bickerton suggests that the logical question would have been, "Why does this happen?" This deals with the central question posed above. But Brown chose to create an arbitrary standard which would help him to overlook the problem, since it was necessary to determine the order of acquisition. Bickerton counters that it was a "necessity" created only by current theory.

Brown's work has been considered very important, but Bickerton claims that although it may have been useful in some ways, it has served to sidetrack the stream of thought away from the central issues of language acquisition.

Bickerton's theory may also shed some light on the field of semantics. Perhaps by knowing the bioprogram, researchers can come closer to answering Clark's unanswered questions. Clark's assertion that we are not in a position to answer those questions may not continue to be true.

The time has come to investigate possible areas of research which would be applicable to Bickerton's theory.

First, and most difficult, would be to question his basic assumption that first generation creole children receive inadequate input. While this assertion seems logical, it is difficult to prove, since there are no active pidgin to creole transitions available to observe first-hand at present. If anyone would be qualified to draw this conclusion, it would be Bickerton, for he has over 20 years' creole research experience.

Second (and this is much easier because of Bickerton's very specific description of the proposed bioprogram language), one could study children's errors to determine the differences between the bioprogram language and the target language. For example, Bickerton found double negatives to be common among all creole languages. He believes this explains the fact that many children raised in an English-speaking environment use double negatives during a certain stage of development, even when the children have never been exposed to such usage. The child is "programmed" to use double negatives according to the theory.

There are many more features which could be investigated, but since this paper's purpose is not to describe the bioprogram language but rather to outline the bioprogram theory and its possible implications in acquisition theory, only a brief and incomplete list of features of
the bioprogram language are given below. This is actually Bickerton's list, taken from the summary of the "Acquisition" chapter of his book.

1) **Specific-nonspecific.** Evidence: universality of creole zero versus indefinite article; errorless English acquisition of $a_1$ versus $a_2$.

2) **State-process.** Evidence: "skewing" of creole verbal systems; distribution of nonpunctuals in creoles; errorless acquisition of English -ing distribution; errorful acquisition of Turkish -di/-mis distinction.

3) **Punctual-nonpunctual.** Evidence: universality of nonpunctual marking in creoles; mode of acquisition of past tenses in French and Italian.

4) **Causative-noncausative.** Evidence: $N_1\overline{V}/NVN_4$ alteration in creoles and English acquisition; errorless acquisition of causative marking in Turkish and Kaluli; problems of English Italian, and Serbo-Croat learners with "generative-semantics-type" causatives.20

Notice that all of the evidence given above is based on data from experiments done for other purposes. He realizes that this is not ideal, and suggests that all of it needs substantiation with research designed specifically with his theory in mind.

Let us look in detail at just the first feature listed above, the specific-nonspecific distinction. Examine the following sentences (all taken directly from Bickerton's book).

1) *If you're sick, you should see the doctor* (NS).
2) *Call the doctor who treated Marge* (S).
3) *The doctor may succeed where the priest fails* (NS).
4) *Dogs are mammals* (NS).
5) *A dog is a mammal* (NS).
6) *The dog is a mammal* (NS).
7) *A dog just bit me* (S).
8) *Mary can't stand to have a dog in the room* (NS).
9) *Bill bought a cat and a dog, but the children only like the dog.*
10) *Bill wanted to buy a cat and a dog, but he couldn't find a dog that he really liked.*

In creole languages, the distinction between specific and nonspecific referents is always made. Therefore, Bickerton proposes that this distinction is part of the bioprogram language. As evidence, he sites Maratsos' studies (1974, 1976), which "confirm by means of ingenious experiments . . . that the article system is acquired at a very early age."22 Maratsos found that the specific-nonspecific distinction (henceforth SNSD) is handled virtually without error by three-year-olds,
"well ahead of the earliest date by which the child masters the definite-nondefinite distinction."\textsuperscript{23}

Bickerton finds this discovery quite remarkable, since there are no definite clues as to which referents are specific, and which are non-specific in English. Looking at the above examples 1-8 we see that in fact the article does not at all signal whether the referent is specific or non-specific. Only in longer, series-type sentences (e.g. 9 and 10) are there any consistent signals. Example 9 shows that if a referent is named twice in a sentence, first we use the indefinite article, then we use the definite, if the referent becomes specific. However, if the referent remains non-specific throughout the sentence (e.g. 10), we use the indefinite article in both slots.

The fact that children learning English master the SNSD at such an early age without concrete signals is in itself remarkable, but it is even more remarkable when we realize that "specific and non-specific reference are connected in no way with external physical attributes or relations of perceived objects."\textsuperscript{24}

Thus we see that although children are exposed to no clear signals to the SNSD in English, and although the SNSD is an abstract concept which cannot be observed or experienced concretely, they still are able to make the distinction at an incredibly early age. If we attempt to explain this phenomenon by suggesting that children always form the correct hypothesis the first time, we are really saying that the child is \textit{programmed} to make the distinction. Thus Bickerton believes his assertion that the SNSD is universal is supported.

Bickerton makes similar claims (although always with second-hand data, remember) for each of the distinctions listed above, and therefore there are a great deal of specific assertions which can be tested readily.

We must keep in mind that even if every assertion Bickerton makes proves false, his original finding (that creole languages are similar throughout the world, and also that the creole syntax differs from the parent-language syntax) still presents itself for explanation; so, if nothing else, Bickerton has given acquisitionists some new information which must be accounted for, and which may prove to be one of the most important discoveries ever made in this field. At first reading, he comes across quite arrogantly, and it would be tempting for acquisitionists to become very defensive. But if one looks at what he is claiming, rather than at the manner in which he is claiming it, he cannot help but be impressed. Bickerton's purpose is not really to condemn acquisitionists, but rather to open their eyes to some new ideas, and help them to look at their field from a fresh perspective. He is not discounting the fact that social and environmental factors have an impact on language acquisition. Rather, he is pointing us in the direction of new questions in hope that these will be studied with as much vigor as other, less central ones have in the past.
END NOTES

2 Ibid., p. 303.
5 Cazden and Brown, p. 303.
6 Ibid.
7 Derek Bickerton, Roots of Language (Karoma Publishers, 1981) p. 139. (Quotes Snow, 1979, p. 367.)
11 Ibid, p. 264.
13 Ibid.
15 Bickerton, p. 134.
16 Ibid.
17 Ibid., p. 139.
18 Ibid., p. 140.
19 Ibid., p. 144.
20 Ibid., p. 212
21 Ibid., pp. 147-148.
22 Ibid., p. 147.
23 Ibid.
24 Ibid., p. 151.

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Brown, Cazden, and Bellugi-Klima, 1969.


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During the past fifteen years, the study of metalinguistic abilities in preschool children has become widespread, involving those interested in measuring what young children know about language. Definitions of "metalinguistics" range all the way from "the ability to view language as a disembodied entity" to "the ability to make language forms opaque and attend to them in and of themselves." The disagreement on the definition and the apparent need to supply a definition in every study suggest that the study of metalinguistics in children is still in very early stages. There is general agreement, though, that metalinguistic ability has something to do with the ability to view language as a disembodied entity and make related judgments. Metalinguistic abilities have been tested by measuring a person's ability to articulate a metaknowledge of language.

It has been assumed in the studies that metalinguistic abilities are not available to infants and toddlers who have not yet developed the cognitive abilities necessary for such a task. This is most probably a good assumption and will be accepted for this study. This paper questions another assumption that researchers have made in their studies of metalinguistic abilities: that is, that metalinguistic abilities are a result of natural language development. Metalinguistic abilities not only require the development of the necessary cognitive abilities, but they also require some sort of teaching to be articulated by native speakers.

In a study which I conducted in 1983, three children were interviewed using Hakes' methods of testing for metalinguistic abilities. The results showed that, even though the judgments of young children were quite accurate, the ability to explain the judgments progressed very slowly until the age when they would have started school. More details of the study will be presented later, but with this brief summary it is interesting to note that judgments were at a high level of accuracy at an early age, yet the ability to explain the judgments was not as accurate. (see Table 1)

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Table 1

Wade Amy Jason

age (years)
A look at a theory of language will help explain why children begin to develop the ability to articulate metalinguistic awareness about the time they start school.

In their paper on second language acquisition, Brown and Williams discuss the transparency theory of language as described by Michael Polanyi. They point out how the fact that language is an instrument and not an object of the speaker's attention makes a difference in second language learning as opposed to second language acquisition. The same principles can be applied to a child's first language acquisition. To show this we can go back to Polanyi's discussion.

In Personal Knowledge, Polanyi describes skills and the thought processes involved in them:

The aim of a skilful performance is achieved by the observance of a set of rules which are not known as such to the person following them.

Bicycle riding is a skill that involves rules that the bicyclist is almost never completely explicitly aware of, but that he is tacitly aware of. In order to ride a bicycle, the person must provide a curvature of each winding that is inversely proportional to the square of the speed for a given angle of imbalance. A bicyclist must obey this rule if he is to avoid falling.

Language is a skill, also. There are certain rules of grammaticality, meaning and other essential elements that the speaker must obey if he is to succeed in communicating.

If a person were tested for his knowledge of how to ride a bicycle by having him watch someone else fall down and then being questioned as to why the person failed, it probably would not yield a good evaluation of the person's own skill in riding a bicycle, and it would probably yield no reference to the rules that are only tacitly understood. The person being tested for meta-bicycle-riding ability could be very capable of following the rule given above for maintaining balance, but only those who were taught exactly what the rule is would be able to indicate that the person who fell off the bicycle failed at a given point to provide the curvature of the winding that would be inversely proportional to the square of the speed. Not knowing this rule explicitly and being expected to give a reason for the failure, a person might even resort to irrelevant answers, such as the cyclist's going too fast or the bicycle's poor quality.

Language is transparent. We are able to use language, as a skill, following the rules, eventhough we may be unable to articulate those rules. If we are asked if something has been said correctly or incorrectly, we can give a description of the rules broken only if we have been taught how to articulate those rules, whether it be through formal schooling or some
other mode of education. Questions involving metalinguistic explanations for incorrect utterances can yield irrelevant answers. Although the person being questioned may have a tacit awareness of the rules that are being violated, without being taught how to articulate the rules, the person would not have an explicit knowledge of the rules.

In my study already briefly summarized, Wade (3;10) was able to judge whether sentences were formed correctly 83% of the time, while his explanations for his judgments did not reflect a good metalinguistic awareness. When asked to judge the sentence "Any men ate lunch," he stated that the sentence was "bad". When asked why, Wade paused for a few seconds with a perplexed look on his face and finally came up with the explanation, "If the men don't eat lunch when it's time, they'll get in trouble." It is highly unlikely that Wade could make correct judgments at a rate of 83% with this type of logic. It is much more probable that Wade, realizing that he was unable to articulate his reason for making the judgment, found another explanation that he could articulate. This new explanation was not correct, but it did fulfill the need to give the interviewer an explanation.

It appears that Wade was tacitly aware of the rules being violated because he was able to judge incorrect sentences as such, but it also appears that he was incapable of articulating those rules. This fits well with Polanyi's definition of a skill. A look at the studies that have been done on metalinguistic abilities in small children will reveal that the researchers have assumed that the ability to articulate metalinguistic awareness is a result of natural language development. If language is a skill, though, then the ability to articulate metalinguistic awareness would have to be taught by supplying the speaker with the understanding and vocabulary necessary to vocally analyze language, just as it is necessary for a person to understand some physics and the jargon involved in order to articulate the reasons why a person has failed at riding a bicycle.

The studies of metalinguistic development in children did not begin until the 1970's. The biggest reason for the late start was the lack of an effective way to measure the metalinguistic abilities in young children. A study done by Brown, Fraser and Bellugi in 1964 proved unsuccessful because of the difficulty encountered in eliciting judgments from the children.

In 1970, Gleitman, Shipley and Alloway suggested a possible way of eliciting acceptability judgments from two-year-olds. They used simple imperatives, such as "Throw the ball" or "Ball the throw" to elicit judgments of "good" or "silly" from the children. The young children were also asked to repeat the "good" sentences and to correct the "silly" sentences. This proved to be an effective way of measuring the children's abilities in judging the acceptability of the
sentences presented to them. With the development of Gleitman et al.'s new method, others began to study metalinguistic abilities in children.

The early studies claimed that most judgments made by young children are based on semantic acceptability rather than syntactic acceptability. In other words, the children were apparently unable to dissociate the words from their meanings. Vygotsky had written that, to a child, a word is an integral part of what it denotes. The young children were unable to articulate any recognition of a syntactic aspect of language. De Villiers and de Villiers claimed that semantic corrections were made by the two and three-year-olds, while syntactic corrections proved to be beyond their capacity. Since children use language to convey meaning, it seems reasonable that semantic explanations would be available to them as far as ability to articulate them goes. The children in the study were asked to judge simple imperatives and correct them (e.g., "Cake the eat" to "Eat the cake"). Only the most linguistically advanced of the eight children was able to make direct word order corrections on more than 50% of the attempts. Three consistently changed the word order, but also changed the meaning (e.g., from "Doggie the find" to "Pat the doggie"). For adults it may seem obvious that "Doggie the find" is really just an inverted form of "Find the doggie", but it may not be as obvious for young children. These researchers claimed that the child's changing of "Doggie the find" to "Pat the doggie" is evidence that the child was unable to focus on problems of syntax. On the contrary, the syntax was, in fact, corrected. There is no evidence that the researchers ever indicated to the children that the meaning could not be changed, if "Doggie the find" does really have meaning.

Gleitman et al. also attempted to show the dominance of the semantic basis for the elicited judgments of young children. The study included three children between 26 and 30 months old. Their main data for evaluation of the metalinguistic abilities in these children were the corrections the children made of simple imperatives that they judged as "silly". Only two of the three children in the study made any corrections at all. One child made nine corrections. Three of the nine corrections merely repeated the sentence to be corrected, two of which were reversed order. Four of the corrections made semantic changes. The second child made ten corrections of sentences judged as "silly". Half of these "corrections" changed word order that was already correct. Seven of the ten corrections changed the imperative semantically. Again, it is never doubted in this study that children would know from natural language development that "Ball me the bring" would be recognized as a reversed form of "Bring me the ball". This study does not list all the sentences that they used in testing the the metalinguistic abilities of the 26 to 30 month old children, but they give a few examples
including "Ball me the bring" of sentences that the children were asked to correct. The researchers comment on the children's inability to correct the sentences. They did not seem to notice, though, that this sentence of four words is twice the length of the average two-year-old's mean length of utterance. It appears that the sentences may have been above the children's linguistic performance level which would most likely make it difficult to propose metalinguistic corrections.

Hakes claimed that metalinguistic abilities do not begin to emerge until age four, corresponding to the cognitive development changes which Piaget has called the emergence of concrete operational thought. Hakes studied one hundred children ranging in age from 4 to 8 years. He included conservation, comprehension, synonymy, acceptability and phonemic segmentation tasks to test the correspondence of metalinguistic abilities and the progression of cognitive development as outlined by Piaget. In his study, Hakes concentrated on the onset of syntactic judgments, rather than the content-oriented (semantic) judgments. The acceptability tasks showed a distinct trend going from semantic to syntactic judgments which he calls "adult judgments", although he admits that adults who are looking for something wrong in a sentence "will seize upon blatant falsity if there is nothing else wrong."  

Again, Hakes has made the assumption that "adult judgments", or syntactic judgments, are a result of natural language development. Some kind of indication that these judgments do not result from natural language development would create the need for an explanation for why the change takes place, since the data does show a definite shift in how the judgments are explained. The shift does coincide with the age at which most children begin school. Let us explore how schooling affects metalinguistic abilities.

If the transparency theory of language is valid in the case of metalinguistic abilities - that is, if metalinguistic abilities are present only if they are taught - then in adults there should be a difference between those who have received schooling and those who have not. In papers written by Mary Hamilton and David Barton, literacy and schooling are shown to have some effect on the metalinguistic abilities of adult native speakers. In Barton's study, it was found that adults of low literacy levels do make a high amount of errors in segmental awareness.

In Mary Hamilton's paper, the literacy of the adults was found to have some effect on their metalinguistic abilities, but the "differences between literacy levels were blurred." She concludes that schooling, more than literacy, affects the metalinguistic abilities and cites recent work done by Cole in which literacy and schooling were separated as independent
factors. Cole worked with the Vai-speaking people of Africa, some of whom were literate and others non-literate. Very few had received formal schooling. Literacy did not seem to have an effect on the people's metalinguistic abilities, but responses varied "according to whether or not people received formal schooling." 15

Hakes states that "metalinguistic abilities show their greatest development during middle childhood, roughly, 4 to 8 years." 16 This coincides with the child's entry into the formal schooling atmosphere.

In light of the transparency theory of language, the studies showing the onset of the ability to articulate metalinguistic awareness as the child begins school and the absence of metalinguistic abilities in unschooled adults as opposed to schooled adults, it would appear that metalinguistic abilities do result from schooling. Although the awareness of metalinguistics seems to be present in preschool children and unschooled adults, they are unable to articulate the awareness. This would account for the fact that preschool children are very capable of judging sentences as right or wrong but are incapable of explaining many of their judgments or correcting incorrect sentences. Future studies on the effects of schooling on metalinguistic abilities in young children will be instrumental in proving whether or not the ability to articulate metalinguistic awareness must be taught or if it is acquired through natural language development.

References


6 Ibid., pp. 49-50.


12 Hakes, p. 28.

13 D. Barton, "Literacy and Awareness of Segmental Structure in Adult Learners," ERIC, document #ed216 510, p. 5.


15 Ibid.

16 Hakes, p. 2.
ACOUSTIC DIFFERENCES BETWEEN THE PORTUGUESE VOWELS OF NATIVE AND NON-NATIVE SPEAKERS

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BRIGHAM YOUNG UNIVERSITY

The purpose of this study is to see what problems a native speaker of English might have in producing Portuguese vowels. More specifically, it is to compare the open and closed vowels of non-native speakers of Portuguese with those of native speakers. A brief review of the vowel sounds in Portuguese and in English may help to introduce this study.

Portuguese has seven vowel phonemes in tonic position. They are /i/, /e/, /æ/, /a/, /ɔ/, /o/, and /u/. The schwa /ə/ is also found in atonic position. English has eleven vowel phonemes. They are /i/, /I/, /e/, /æ/, /a/, /ɔ/, /o/, /u/, /u/, and /u/. Table 1 displays these vowels on a chart to make them easier to read.

<table>
<thead>
<tr>
<th>Portuguese</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front</td>
<td>Front</td>
</tr>
<tr>
<td>High</td>
<td>/i/</td>
</tr>
<tr>
<td>Central</td>
<td>/I/</td>
</tr>
<tr>
<td>Mid</td>
<td>/e/</td>
</tr>
<tr>
<td>Low</td>
<td>/æ/</td>
</tr>
<tr>
<td>Back</td>
<td>/a/</td>
</tr>
</tbody>
</table>

Table 1

Notice that the English vowels /i/, /e/, /æ/, and /u/ are accompanied by [iː], [eɪ], [ɔː], and [uː]. This is because tense vowels are usually pronounced as diphthongs. This study will compare the Portuguese open /e/ with the closed /e/ and the open /a/ with the closed /ɔ/.

All four of these vowel sounds are found in English. They are, however, a little different. In English the open /æ/ is like the vowel sound in the word "bet". The closed /e/ is usually diphthongized as in the word "pay". The open /ɔ/ in English is only found in certain dialects. Some English speakers say the word "caught" with an open /ɔ/. The closed /ɔ/ is also usually produced as a diphthong as in the word "bout". I will refer to these different vowel sounds as open and closed, although some call them tense and lax.

In Portuguese the open /e/ can be heard in words like "céu" (heaven) which is phonetically transcribed as [séu]. An example of the closed /e/ is "seu" (your), phonetically transcribed as [séu] and which is a minimal pair with "céu" (heaven). In Portuguese the open vowels are only found in tonic position. Generally Portuguese words have stress on the second to last syllable unless otherwise marked with an accent. Those words that do carry an accent mark, have a circumflex accent for a closed vowel and an acute accent for the open vowels. For example, the open /ɔ/ in the word for grandmother is written with an acute accent, "avó" phonetically written as [avɔ]. The word for grandpa is written with a circumflex accent because it is pronounced with a closed /ɔ/,
"avo" or [av6]. Words that do not carry a written accent do not give any clue as to their pronunciation.

There are certain tendencies that might give a person an idea of how to pronounce a word. For example, "compra" (he buys): In this word the "o" is in the accented second to last syllable, but there is no accent mark to tell us if we should say /ɔ/ or /o/, however, because the "o" is followed by a nasal consonant the "o" will be closed, [kompra]. Another indication that sometimes helps is the spelling. Words that end in "osa" are almost always open. For example, the adjective "maravilhoso" (marvelous) has a closed /o/, phonetically [maraviKɔzu]. The feminine form of marvelous, "maravilhosa" ends in "osa" and has an open /ɔ/, [maraviKɔsa]. Of course there are exceptions to these tendencies. For example, "esposa" (wife) ends in "osa", but is pronounced with a closed /o/. Even though there are exceptions, by knowing about the written accent marks and the pronunciation tendencies a non-native speaker of Portuguese will be more prepared to open and close his vowels correctly.

To see if non-native speakers of Portuguese produce the same vowel sounds as do native speakers, an acoustic comparison was made with a sonagram. A sonagram is a machine that measures the frequencies and intensities of sounds and then graphically displays them on a piece of paper called a sonagram. On a sonagram at certain frequencies, darker areas are burned into the paper. These darker areas on the sonagram are called formants. These formants show the frequency or the pitch of the sound being measured with the sonagram. Other formants appear on the sonagram also. The other formants are multiples of the main frequency and are called harmonics. Measuring the frequencies of the formants shows how open and closed the vowel is. For example, /i/ is a very high vowel and therefore, is very closed. /a/ is a low vowel and is, therefore, very open. On a sonagram the more closed a vowel is, the lower the frequency of the first formant. The first formant of /i/ will be lower than the first formant of /a/.

Second, measuring the frequency of the second formant shows a vowel's location front-back. For example, /i/ is a front vowel, and therefore, has a second formant with a high frequency. /u/ is a back vowel and has a second formant with a low frequency. Perhaps a diagram would help to show this distinction. Figure 1 shows what an ideal sonagram of the Portuguese vowels would look like. The numbers going up the left margin represent the frequencies of the formants.

In this study, sonagrams were made of ten native Brazilians who are students at Brigham Young University. Sonagrams were also made of thirteen Portuguese speaking Americans, also students at Brigham Young University. All of the Americans had lived in either Portugal or Brazil for at least fifteen months with an average stay of twenty months. All the Americans speak at what would be considered a level three of an F.S.I. test. All the native Brazilians had previously been taped, reading a list of nearly four hundred words for a study about vowel differences in tonic, pretonic and postonic position. This study was done by Willis Fails and Halvor Clegg of the Spanish and Portuguese Department at Brigham Young University. The non-native speakers of Portuguese in my study read a smaller version of the same list of words.
Since the purpose of this study is to compare the open and closed "e" and "o", the following words were chosen for comparison. See Table 2:

<table>
<thead>
<tr>
<th>open syll.</th>
<th>closed syll.</th>
</tr>
</thead>
<tbody>
<tr>
<td>closed e</td>
<td>cedo (early)</td>
</tr>
<tr>
<td>open e</td>
<td>breve (soon)</td>
</tr>
<tr>
<td>closed o</td>
<td>bobo (silly)</td>
</tr>
<tr>
<td>open o</td>
<td>pobre (poor)</td>
</tr>
<tr>
<td></td>
<td>deste (of this)</td>
</tr>
<tr>
<td></td>
<td>festa (party)</td>
</tr>
<tr>
<td></td>
<td>posto (put)</td>
</tr>
<tr>
<td></td>
<td>costa (back)</td>
</tr>
</tbody>
</table>

Table 2

Each sound was represented in an open and in a closed syllable. The frequencies of the formants of the "e" in "cedo" (early) and "deste" (of this) were measured to give the location of the closed /e//. The formants of the "e" in "breve" (soon) and "festa" (party) were measured to show the place of articulation of the open /œ/. The first "o" of "bobo" (silly) and "posto" (put) was measured to locate the closed /o/. Finally the frequency of the "o" in "pobre" (poor) and "costa" (back) provided the location of the open /ɔ/. After the frequencies of these vowels were measured they were plotted on a Koenig-Scale on a scatter diagram. On a Koenig-Scale the first formant is plotted on the sheet top to bottom in order to show how open the vowel is and the second formant is plotted left to right to show how front or back the vowel is. Figure 2 shows the frequencies of the vowel formants of the native speakers of Portuguese. Both the open and closed syllables are plotted together because there really was not much of a difference. Notice the well defined areas of each vowel sound. Appendix 1, included at the end, gives the statistical information of all the formants of each of the words of the native speakers.

The frequencies of the vowel formants of the non-native speakers were also plotted on Koenig-Scale in a scatter diagram. Figure 3 shows the location of the vowels of the non-native speakers. The closed vowels are marked with X and the open vowels are marked by circles. With the non-native speakers we no longer see well defined areas of open and
Fig. 2 shows the location of the open and closed vowels of the native speakers. Closed vowels are marked with an x.

Closed vowels. Instead we see that the location of articulation has merged. What figure 3 shows us is that the non-native speakers are pronouncing the open and closed vowels in the same way. They are not distinguishing between the two. The non-native speakers pronounce the "e" in cedo and the "e" in festa the very same. Appendix 2, gives the statistical information for all of the formants of the non-native speakers.

After the scatter diagrams were made an average location of the vowel formant was determined. Table 3 gives the average frequencies for each
Fig. 3 shows the location of the open and closed vowels of the non-native speakers. Closed vowels are marked with an x.

### Table 3

<table>
<thead>
<tr>
<th></th>
<th>1st F.</th>
<th>2nd F.</th>
<th></th>
<th>1st F.</th>
<th>2nd F.</th>
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<tbody>
<tr>
<td>non-native e</td>
<td>502</td>
<td>1854</td>
<td>non-native o</td>
<td>473</td>
<td>901</td>
</tr>
<tr>
<td>native e</td>
<td>383</td>
<td>1936</td>
<td>native o</td>
<td>399</td>
<td>780</td>
</tr>
<tr>
<td>non-native ɔ</td>
<td>554</td>
<td>1763</td>
<td>non-native ɪ</td>
<td>523</td>
<td>960</td>
</tr>
<tr>
<td>native ɛ</td>
<td>539</td>
<td>1659</td>
<td>native ɪ</td>
<td>545</td>
<td>939</td>
</tr>
</tbody>
</table>

Table 3
The first formants of the open vowels for both the native speaker, as well as, the non-native speaker are pretty much the same. The first formants of the open vowels, however, show a major differences from native speaker to non-native speaker. With both the closed /e/ and the closed /o/ the native speaker produced a sound that is much more closed. The non-native speaker produced closed vowels that have first formants almost equal to those of the open vowels. What this all says is that the non-native speaker produces the closed vowels like open ones. Graphically this distinction is easily seen in Figure 4. The vowels of the native speakers are found in parenthesis. Notice the distance between the open and closed vowels of the native speaker as compared to how close the open and closed vowels of the non-native speakers are.

Fig. 4

Fig. 4 shows the average location of the open and closed vowels. The native speaker's vowels are marked in parenthesis.
Considering that all the non-native speakers are at least at a level three F.S.I. proficiency in Portuguese, the data presented is significant. The subjects were not beginning first semester language students. If these subjects have difficulty in pronouncing the open and closed vowels, it is safe to predict that almost all non-native speakers of Portuguese will need to exert extra care in producing these vowel sounds. Besides showing the differences of the Portuguese vowels between native and non-native speakers, this study also shows the value of acoustic comparisons. The sonagram can easily show what is really being produced when just listening produces results that can not be measured.

References

Appendix 1

Statistical information of the native Portuguese speakers

<table>
<thead>
<tr>
<th>Sub.</th>
<th>cedo</th>
<th>deste</th>
<th>breve</th>
<th>festa</th>
<th>pobre</th>
<th>costa</th>
<th>bobo</th>
<th>posto</th>
</tr>
</thead>
<tbody>
<tr>
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<td>375-1350</td>
<td>550-1675</td>
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<td>525-900</td>
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<td>400-775</td>
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<td>3</td>
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<td>350-2025</td>
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<td>600-950</td>
<td>600-1150</td>
<td>400-850</td>
<td>350-1000</td>
</tr>
</tbody>
</table>

ave  400-1939 | 365-1933 | 520-1663 | 555-1655 | 535-918 | 555-960 | 405-758 | 393-803

Appendix 1 shows the first and second formants of each of the words tested. "Cedo" and "deste", as well as, "bobo" and "posto" are closed. "Festa" and "breve", as well as, "costa" and "pobre" are open.
Appendix 2 shows how long each subject was in Brazil or Portugal and how long it has been since he returned. The first and second formants of each of the vowels tested are also given. "Cedo" and "deste" have closed "e", "breve" and "festa" have open "e". "Pobre" and "costa" have open "o" and "bobo" and "posto" have closed "o".

<table>
<thead>
<tr>
<th>Sub.</th>
<th>Brazil</th>
<th>Home</th>
<th>cedo</th>
<th>deste</th>
<th>breve</th>
<th>festa</th>
<th>pobre</th>
<th>costa</th>
<th>bobo</th>
<th>posto</th>
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</tr>
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<td>450-1900</td>
<td>600-1700</td>
<td>550-1850</td>
<td>600-875</td>
<td>600-950</td>
<td>450-850</td>
<td>450-925</td>
</tr>
<tr>
<td>11</td>
<td>22mths</td>
<td>15mths</td>
<td>450-1900</td>
<td>550-1950</td>
<td>525-1900</td>
<td>550-1975</td>
<td>600-900</td>
<td>600-925</td>
<td>500-850</td>
<td>500-800</td>
</tr>
<tr>
<td>12</td>
<td>22mths</td>
<td>16mths</td>
<td>450-1700</td>
<td>475-1925</td>
<td>525-1750</td>
<td>550-1800</td>
<td>475-900</td>
<td>550-1000</td>
<td>500-875</td>
<td>525-950</td>
</tr>
<tr>
<td>13</td>
<td>18mths</td>
<td>5yrs</td>
<td>450-1975</td>
<td>400-1800</td>
<td>500-1500</td>
<td>600-1450</td>
<td>550-900</td>
<td>550-1025</td>
<td>400-875</td>
<td>350-825</td>
</tr>
<tr>
<td>ave</td>
<td>20mths</td>
<td>14mths</td>
<td>494-1825</td>
<td>510-1883</td>
<td>544-1742</td>
<td>564-1785</td>
<td>519-935</td>
<td>527-985</td>
<td>469-876</td>
<td>476-925</td>
</tr>
</tbody>
</table>
Those of us who have spent countless hours and even years trying to master other languages have felt that sinking feeling of frustration as we begin to lose our hard-earned abilities either through disuse or lack of opportunity to use our language skills. The problem of language attrition has long intrigued me and has led to the present project which asks the question, "Can lost language abilities be retrieved using hypnotic age-regression techniques?" This was a pilot study to see if further research was warranted.

Hypnosis and age regression

Neither of these two phenomena is without controversy. First of all, no one really knows what hypnosis is. The best definition I've received to date is from a class on hypnosis. The instructor defines hypnosis as, "The bypassing of the critical faculty (the conscious) and the establishment of selective or discriminative thinking." I feel that the key here is bypassing the critical faculty which helps to remove fear. This is only a surmation on my part, but I feel further research will bear this out.

The subject of age regression has also been very controversial. While I have not yet been able to review all the literature on the subject, it is safe to say that the core of the controversy is - "Is hypnotic age regression real or is it merely role playing?" Reiff and Scheerer say:

one of the most interesting and controversial phenomena of memory in hypnosis is the apparent "regression" of the subject to an earlier age upon command. The subject appears to exhibit some behavior patterns consistent with that particular age period. Whether the subject is actually regressed to a previous age or is acting out an adult concept of what he was like at that earlier age is the core of the controversy. (p. 62)

There are also those who feel there are several types of age regression. Erickson and Kubie (1941) suggest there might be two kinds of regression.

There can be a "regression" in terms of what the subject as an adult believes, understands, remembers, or imagines about that earlier period of life. In this form of regression, the subject's behavior will be a half-conscious dramatization of his present understanding of that previous time, and in which he will behave as he believes would be suitable for him as a child at the suggested age level. The other type of regression is far different in character and significance. It requires an actual revivification of the patterns of behavior of the suggested earlier period of life in terms of what actually belongs there. It is not a regression through the use of current memories, recollections, or reconstruc-
tions of a bygone day. The present itself and all subsequent life and experience are as though they were blotted out. (p. 592)

Weitzenhoffer (1953) suggests three types of regression: (I) Those times when the adult is simply acting out his own opinion of how a child would behave at the time; (II) denotes a true 'psychophysiological' return to a past state; (III) is a combination of parts I and II.

LeCron (1971) believes there are two distinct types of age regression. The first is a real regression to a past event which is then relived. This type requires a very deep trance state. The second is more of a surface type regression that doesn't require as deep a trance state. Results are easier to obtain from this latter type of regression. (p. 20)

I feel that what age regression under hypnosis boils down to is merely whether or not you are willing to accept or believe in its validity or not.

Research to date using hypnotic age regression to recover lost language ability

The research to date indicates that lost language abilities can be retrieved through the use of hypnosis. Reiff and Scheerer (1959) used hypnosis and age regression on a 26-year-old woman who had once done very well in Latin and had even won several awards for her translation abilities. The subject was asked to see how much of her Latin skills were still intact. She still had fragmented use of Latin but when asked to conjugate the verb esse, and decline Gallia, she failed. Placed under hypnosis and age regressed to her college days the subject did each of these tasks accurately and even translated a passage from the Gallic Wars. When returned to her normal state she was asked again to perform the tasks, but could not. The experimentors concluded:

In reviewing this record it becomes obvious that her ability to translate Latin to English was impressively greater (under hypnotic age regression) than during pre- and post-hypnotic waking states. (p. 203)

Orne (1951) age regressed a 26-year-old male to the age of six. This man had spoken German until his teens when he moved to America. When age regressed he did not automatically revert to his mother tongue of German. When asked what his mother said on his sixth birthday about his present he replied in English, "Do you like your present?" It was suggested his mother had really said, "Has du dein Geschenk gern?" The subject looked confused for a few moments and then responded in German from that point on. Once he began speaking German, he made no claim to understand English, but understood all questions asked him in English. He still only responded in German.

Fromm (1970) was surprised to find when age regressing a 26-year-old Japanese American to the age of three he spoke in Japanese. When taken out of hypnosis and asked if he knew any Japanese he firmly said he did not. Campbell and Schumman (1979) played Fromm's tape recording of these sessions for a native speaker of Japanese without telling him the subject
was under hypnosis. He says:

... he seems to be an adult around twenty to thirty years of age. At least it can be said that he is not a child, as the quality of his voice is that of an adult. Probably, he suffered from aphasia and he is gradually overcoming it. It seems to me that he is trying hard to remember some Japanese in such a way as a mentally retarded child speaks. Sometimes his utterances are incomplete and incorrect. He speaks in a sing-song manner as if he were acting on a drama stage. In his utterance, for example, bokuno inu-yo-yo is usually used by little children from 3-10 years of age. On the other hand, desu in his utterance hontoni ii desu, is naturally used by adults. However, generally speaking, his utterances are very childish, they are those three to five year old children use. (p. 87)

The subject himself said of the experience when encouraged to remember it:

It was like my lips all of a sudden would move into these funny shapes. And then I would want to say something and wouldn't know what I was really saying. The words just came out and I wasn't sure whether they were real or not. The strangest thing is that my muscles without my volition would just take over. It was really like my mind wasn't involved in it. (Fromm, p. 83)

As (1961) had an 18-year-old male born in Helsinki and whose parents spoke Swedish in the home. When he was five years old he moved to America with his mother. From six years old onward, he spoke only English and declared he had forgotten Swedish altogether. Before using hypnosis, As tested the subject's knowledge of Swedish. The subject was then tested under hypnosis. The subject was found able to respond to certain questions, count to ten, and name certain objects in Swedish that he was unable to do in the normal state. The conclusion by As was that, "... a clear improvement in Swedish language took place during the hypnotic regression, but the change taken as a whole, was not particularly dramatic." (p. 28)

Campbell (1978) tried to replicate the previous studies by age regressing a 28-year-old Japanese woman to ages of five and younger. Campbell's experiment failed to produce results. He concludes:

We are very interested in the negative results obtained from these attempts to revivify the Japanese language competence of the S when all of our criteria seem to have been met. It is possible that potential for language retrieval has a strong correlation with a S's degree of suggestibility. Although capable of age regression, the S scored only eight points on the Stanford Scale, which suggests that she is only a moderately good hypnotic subject. (p. 92)

It becomes all too evident that there is a great lack of empirical research to support using hypnosis as a research tool in language study. Much more work and data collection are needed.
Problems with research to date

A close examination of the above studies reveals similarities common to all:

1. All subjects except Reiff and Scheerer's spoke a mother tongue other than English the first years of their lives and over the course of time seemed to forget all knowledge of ever having spoken a foreign language.

2. All of the studies showed success in the retrieval of lost language abilities under the influence of hypnosis except Camp­bell, who was trying to reduplicate the former studies.

3. All subjects were age regressed to childhood ages of between 3 and 7 years of age except Reiff and Scheerer's, who was regressed to college age.

Campbell's study led him to the conclusion that the subjects must be willing to subject themselves to hypnosis and that the subjects must score on the upper extremes of hypnosis suggestibility scales. He believes very strongly that the reason he has failed to reproduce the former studies is that his subjects have all fallen into the 'average' category of hypnotizability, while Fromm's subject was extremely high, a 12, on the scale of hypnotic suggestibility.

Research and interviews with several hypnotherapists and psychologists has led me to believe that anyone rating a 12 on the susceptibility scales is very rare indeed. This fact alone, coupled with the rarity of finding subjects that spoke a foreign language while young and are now adults, would seem to be looking for the proverbial 'needle in a haystack.'

This has led me to ask where the present research is going. Has it boxed itself in? What good are the present methods for those of only average hypnotizability and who didn't learn a second language until their teens or later? It seemed that unless a wider use could be made of hypnotic retrieval techniques this type of research would be of no use in a study of language attrition.

Method

Reiff and Scheerer (1959) report that depth of trance will affect any results obtained under hypnosis. It is accepted that to reach the age regression levels attained in the previous studies, a very deep trance is needed. In this pilot study I postulated that if a person learned a language in his teens or older, then a deep trance state would not be needed. A light trance would do as well. Since most people can obtain a light trance state, I also postulated that a subject be of only average hypnotizability. I searched for a subject who could meet the following criteria:

1. Had a real desire to recover lost language abilities.
2. Had learned his language in his teens or later.
3. Didn't have any qualms about being hypnotized.
4. Was of only average or less hypnotizability.

The S chosen met all of the aforementioned criteria. The S was male and had just turned 53 years of age as we began the project. The language that had been learned was Finnish and had been learned in the later teens and early twenties. The S's Finnish had been used on a daily basis for purposes of teaching and social interaction over a two-year period. The subject had been a missionary and had taken particular pride in his ability to tell the Joseph Smith story in Finnish. The subject had not done this in thirty years. Could the subject retell the Joseph Smith story better from conscious memory, or better under hypnosis?

Prior to the hypnosis the subject was asked to tape himself telling the Joseph Smith story without previous practice or rehearsal. This was done to provide us with some standard of his present abilities in Finnish.

It should be noted here that eight sessions were planned, but only three were realized due to circumstances beyond our control.

**First hypnosis**

The first session was used primarily to allow the S and hypnotist to get acquainted. The subject was questioned about his reactions and feelings toward hypnotism. We received a very positive response. The subject was placed in a very light trance and asked to perform several mental tasks. This was done to test the S's ability to be hypnotized and his suggestibility.

The subject was placed under hypnosis again and then regressed to a time when he was very happy at the age of 19. The subject was allowed to adapt to this change in time and to orient himself. At this juncture the subject was asked to speak. It was noted at this point that the S came up from a medium trance into a light trance and then almost entirely out of trance. S was given the suggestion that on subsequent sessions he would be more relaxed and be able to talk without coming out of trance. The first session was then ended.

This first hypnosis revealed several important factors:

1. The subject was determined to be of average suggestibility by his performance on the tasks given him to do. This suited my purpose.

2. A fluctuation of trance state was observed when the subject tried to speak. I feared this might affect the results, but was assured the S could be conditioned to do it better over the course of time.

3. The results were highly influenced by anxiety and the newness of being hypnotized for the first time.
4. The subject seemed acutely aware of his failure and thought himself unsuitable as a subject. He was concerned I wouldn't be able to get results from him for my research. He was reassured at this point in time that it didn't matter whether I got positive results or negative results; both were significant.

Second hypnosis

Nearly two weeks passed in between sessions. The subject assured me that he hadn't practiced in the interim. The subject was considerably more at ease with the situation the second time. The S seemed very relaxed and calm. The S was again hypnotized and regressed. This time, instead of asking the S to speak, he was asked to see himself telling the Joseph Smith story, to visualize it as the best story he'd ever told in Finnish.

This second session began to encourage us:

1. The subject felt he might have attained a much deeper trance than previously. This might have been due to his being more relaxed and comfortable with the situation.

2. He felt he could have told the Joseph Smith story almost flawlessly if we had asked him to speak.

3. We felt progress was being made.

Third hypnosis

The subject appeared much more relaxed and confident about the situation in our third session. He was again regressed but asked to speak this time in telling the Joseph Smith story. Again the subject assured us he had made no conscious effort to rehearse the story in between sessions.

1. The S appeared as though he was really enjoying his rendition. This session was tape recorded.

The results

Due to my inability to speak Finnish I turned elsewhere to have my data analyzed. My sincerest thanks go to Dr. Melvin Luthy, Department Chairman of Linguistics, Brigham Young University. His are the remarks that follow. The letter B corresponds to the tape done without hypnosis and A to the tape done under hypnosis. Dr. Luthy has commented on four areas: (1) Pronunciation, (2) Vocabulary, (3) Grammar, and (4) Idiom. In each section errors are indicated by the use of an asterisk (*).

To read the actual transcript of the two versions in Finnish, they have been supplied, along with an English translation, in the appendix.
COMMENTS ON VERSIONS A AND B

Pronunciation

I can perceive no significant differences between the two versions. Minor errors occur in the length of final long vowels and in some instances of gradation in both versions, but these are typical of all English speakers who speak Finnish as a foreign language.

Vocabulary

<table>
<thead>
<tr>
<th>Without Hypnosis</th>
<th>With Hypnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>*bibliassa</td>
<td>roomattusa (correct)</td>
</tr>
<tr>
<td>*kysykoon</td>
<td>pyytää (correct)</td>
</tr>
<tr>
<td>*valttamatta</td>
<td></td>
</tr>
<tr>
<td>*pilikki</td>
<td>soimaamatta (correct)</td>
</tr>
<tr>
<td>*kolkeutui</td>
<td>(doesn't use corresponding idea)</td>
</tr>
<tr>
<td>*valta</td>
<td>*kolkeutui (this appears in both versions)</td>
</tr>
<tr>
<td>*valteutti</td>
<td>mahti (more correct term)</td>
</tr>
<tr>
<td>*lahti(?)</td>
<td>(doesn't use corresponding idea)</td>
</tr>
</tbody>
</table>

Version B has at least seven, possibly eight, incorrect vocabulary items. Version A has only one clearly incorrect vocabulary item. There is one use of an incorrect word for bible in Version B. It is bibliassa, but later in the version the correct word is used. In Version A the correct word for bible is used throughout. The second vocabulary item used incorrectly is kysykoon. The more correct term is used in Version A. It is pyytää. The incorrect kysykoon means ask but it means more to question. The intent here should be to request rather than to ask a question. In Version A the correct verb is used in this connection, but later on another form of the verb to question is used when the verb to request should have been used. Thus, the verb to question is used in both versions incorrectly when the intent was to request.

In Version B the speaker uses a word valttamatta in quoting a scripture. That is not a correct Finnish verb. The correct verb and verb form is used in Version A. It is soimaamatta. In Version B, a word pilikki is used. Again, this is an incorrect term which possibly resulted from an intent to say pisti. Version A does not discuss a corresponding idea. In Version B the speaker uses a verb kolkeutui, which is nonexistent in Finnish. Curiously, he also uses the same verb in Version A. The intended verb here was polivistua. I can only guess that there was confusion in the mind of the speaker with perhaps two other verbs; polveutua, which means to be descended from, and is clearly related to polivistua; and kolkuttaa, which means to knock. The verb that the speaker used in both versions seems to be a blend of these two verbs. In Version B the speaker uses the term valta which does mean power, but it means it more in a political sense. In Version A he chooses a more correct term, mahti, which refers more to force or power. This is a more correct term.
In Version B, he uses a term valteutti, which again is a nonexistent Finnish verb. He does not use the corresponding idea which would cause him to select that same verb in Version A. In Version B he uses the expression lahti hanet which means literally left him, but the verb left in this case is an intransitive verb requiring a case ending on the pronoun which would mean left from him. If the speaker intended to mean that he left him, meaning something like left him alone, then the verb would have been jatti, in which case the pronoun would be in the appropriate form. Thus, this case could be considered either an error in vocabulary choice or in grammar, depending on the intent of the speaker.

Grammar

Without hypnosis

<table>
<thead>
<tr>
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<th>With Hypnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>*sydansa</td>
<td></td>
</tr>
<tr>
<td>*pyytamaan (obj. was lacking)</td>
<td></td>
</tr>
<tr>
<td>*huuti</td>
<td></td>
</tr>
<tr>
<td>*lahti hanet (?)</td>
<td></td>
</tr>
<tr>
<td>*tuntui itsensa</td>
<td></td>
</tr>
<tr>
<td>*rakastama poika</td>
<td></td>
</tr>
</tbody>
</table>

In Version B there are at least five, possibly six, errors in grammar. The word sydansa is not declined into its appropriate form. The verb pyytamaan lacks an overt object which is necessary in Finnish. The verb huuti is an incorrect past tense form of the verb. The expression lahti hanet has been discussed under vocabulary above. The expression tuntui itsensa is incorrect because the verb is an intransitive verb followed by an inappropriate object. The form rakastama poika is incorrectly formed.

Idiom

Without Hypnosis

<table>
<thead>
<tr>
<th>Without Hypnosis</th>
<th>With Hypnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>*oikeassa (two occurrences)</td>
<td>oikea (correct)</td>
</tr>
<tr>
<td>*paansa ylle (arch.)</td>
<td>*hanen edelleen</td>
</tr>
<tr>
<td>*han tuntui hyualta</td>
<td>(doesn't use corresponding idea)</td>
</tr>
<tr>
<td>*yksi puhui (doesn't use corresponding idea)</td>
<td>*yksi puhui</td>
</tr>
<tr>
<td>(doesn't use corresponding idea)</td>
<td>*siina</td>
</tr>
</tbody>
</table>

The speaker makes errors in idiomatic usage in both versions. One idiom used incorrectly in Version B is used correctly in Version A. That one is oikea. Another idiom used incorrectly in Version B is also used incorrectly in Version A. That idiom is yksi puhui. It simply means one spoke, but in Finnish you must say the other spoke.

In both versions he approaches the idea of something coming over his head
and the idiom is different in both cases, but wrong in both cases. In Version B the idiom is understandable but very archaic; and in Version A the form is correct, but the meaning is slightly incorrect. This may be classified as a vocabulary error. There are two other idioms of minor consequence in Version A which are used incorrectly. One is siina, meaning in it or therein. The correct form should be sielta, meaning from there. This possibly could be considered a grammar error. The other idiom could possibly be a slip of the tongue. It is jolla oli neljä­toista. The intent here is to say he was 14 years of age, but it turns out to say who had 14 years. It may be a slip of the tongue.

Overall impressions

In both versions, the speaker hesitates frequently to search for the next expression. Version A shows more grammatical complexity and accuracy and broader and more skillful use of the vocabulary. Version A is rhetorically more sophisticated, and sentences are much better developed.

Conclusions

While this has been only a pilot study, I am very encouraged by the results obtained thus far. From the outset I was concerned that hypnosis could not be used with the average L2 learner because of the scarcity of people who are able to attain very high scores on the hypnotic suggestibility tests. This study shows that a light trance is sufficient if the subject is not being regressed to early childhood and that there is an improvement in language ability of those determined to be of only average hypnotizability. While I cannot say this with absolute certainty because this is only one subject, I feel very encouraged that further experimentation and research will prove me correct.

Where is the present research headed? It has certainly raised more questions than it has answered. It is hoped that this might become a viable and useful tool for those studying language attrition. It might also be of use in not only unconscious retrieval of language, but conscious retrieval and re-use of the speaker's language abilities. Only further research will be able to tell.

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Kun mina lahtin lahetystyohon, mina en voinut
siihen aikaan kertoa teille miksi mina menin
lahetystyohon ja nyt mina haluaisin kertoa teille
eraasta nuoresta pojasta nimeltään Joseph Smith
joka vuosia sitten halusi tieda mika kirkko oli
oikea. Han luki Raamatusta ..luki Raamattua
ja siinä han loysi mikan kohdan missa sanotaan
eta jos joltakin teista puuttu viisautta,
han voi pyyta sita Jumalalta joka anta
kaikille altiisti ja soimaamatta. Han voi saada
viisautta..han voi tieta mika on oikea, mika on
totta. Ja sitten tama nuorukainen Joseph Smith
jolla oli neljäkerta vuotta ..han halusi tieta
mika kirkko oli oikea ja sen jälkeen kun
han luki taman kohdan raamatusta han tiesi etta
han voi pyytaa viisautta Jumalalta siita asiasta.
No niin. Seuraavana paivana aamulla han meni
metsään ja siella han kolkeutui ja alkoi
pyytaa viisautta Jumalalta, han alkoi ruokilaa
Jumalalle, kysyeni hanelta viisautta. Kun han juuri
oli rukoilemiasillaan hanta..oli suuri mahti joka
....ei antanut hanen rukoilla, mutta han vihdoin
voi rukoilla ja voi pyytaa, voi kysya, voi huuttaa
Jumalalle, niin han naki valopatsaan joka tuli
hanen edelleen ja siinä oli kaksi ihmista yksi
puhui sanoen tama on minun rakas poikani, kuule
hanta. Tama nuorukainen Joseph Smith kysyi mika
kirkko on oikea ja Jumalan poika Jeesus Kristus
puhui hanelle sanoen etta maan paalla
ei ole sita kirkkoa. Oli joskus kauan
kauan aikan ajan sitten kauan aika
sitten muta nyt ei enää ole mutta tulemme
palauttamaan kirkon maal paalle. Sen jalkeen
Joseph Smith palasi kotiin han tiesi
etta oikea tosi kirkko ei ollut maan
paala etta se etta Jumala pian tulisi
palauttamaan sen. Mina todistan teille
Rouva Niemi etta tama kirkko nyt on maan
paalla Se on Jeesuksen Kristuksen tosi
kirkko ja sen nimi on
Myörempien Aikojen Pyhien Jeesuksen Kristuksen Kirkko.

TAPE A Translation

When I left on a mission I did not know at that time how
to tell you why I went on a mission, and now I would like
to tell you of a certain young boy by the name of Joseph
Smith who years ago wanted to know which church was right.
He read from the Bible..read the Bible and therein he found
a certain verse where it says that if any of you lack wisdom
he can ask of God who gives to all liberally and abraideth not.
He could receive wisdom. he could know what is right, what is true.
And then this youth Joseph Smith who was fourteen years old..he wanted
to know which church was right and after he had read this verse
in the Bible he knew that he could ask wisdom of God..about this matter.
Okay, the following day in the morning he went into the forest and
there (inappropriate term) and began to ask wisdom from God, he began
to pray to God, asking requesting wisdom from him. Just as he
was about to (beginning to) pray, he...there was a great power that
did not let him pray, but he was finally able to pray, able
to ask, able to question, able to cry out to God, and he saw
a pillar of light which came before him and therein were two persons.
One spoke saying this is my beloved son, hear him. This youth Joseph
Smith asked which church is right and the Son of God, Jesus Christ
spoke to him saying that that church was not on the earth.
It had been a long time ago but it was no more, but we will come
to restore the Church to the earth. Afterwards, Joseph Smith returned
home and knew that the true church was not on the earth, that God soon
would come to restore it. I testify to you Mrs. Niemi that this church
is now on earth. It is the true church of Jesus Christ and its name
is the Church of Jesus Christ of Latter-day Saints.
Incorporation of Scientific and Technological Terminology in the Arab World and Israel
A Comparative Study

By Sadok H. Masliyah
Weidner Communications, Provo

The growth of linguistic needs, the constant advance of science and technology, and the new fields of knowledge the Arab countries and Israel have been entering required terms in the realm of Law and Politics, the Army, the Navy, Aerospace, and the Natural Sciences to mention a few disciplines.

The contributions of earlier generations to the enrichment of both Arabic and Hebrew had been considerable, but they have been incapable of meeting the needs of modern sciences and technologies. To meet these needs, the language academies in some of the Arab countries and Israel undertook the task of coining new terminology in the various fields. The Hebrew Academy, unlike the Arabic academies had also to revive Hebrew as spoken language and make it a medium of public expression.

The immediate motivation to deal with the terminology of any particular profession or sphere came from pressing public need. Yet the words and terms these academies coined did not always become obligatory elements of the school and university syllabi.

The first language academy in the Arab world was founded in Damascus in 1919 (al-Majma' al-'Ilmi al-'Arabi Bidimasq). It was followed by the Royal Academy for the Arabic Language (Majma' al-Lughah al-'Arabiyyah al-Malaki) established in Cairo by a royal decree in 1932. After the revolution of 1952 and the subsequent abolition of the monarchy in Egypt, the name was changed to what it is currently known as the Academy for the Arabic Language (Majma' al-Lughah al-'Arabiyyah).

It was not until 1947 that the Iraqi Academy (al-Majma' al-'Ilmi al-'Iraqi) was founded. About thirty years later (1976), the Jordanian Academy for the Arabic Language was established. To coordinate and unify the linguistic activities of the Arabic academies, the Arab League financed the establishment of the Coordination Bureau of Arabization (Maktab Tansiq al-Tarib) in 1956. Its center is Rabat, Morocco. The Academy of the Hebrew Language was founded in 1953 as a continuation of the Hebrew Language Committee (Va'ad ha-La'ason ha-'Ivrit) which was active from 1890 until 1953.

The composition of the Arabic academies on one hand, and the Hebrew Academy on the other hand is alike. Many of their members are scholars in the domain of language and literature, professors, writers, and essayists. Some of the Arabic academies included foreign scholars and other members from Arab countries. The Egyptian Academy in 1935 consisted of twenty active members, ten of whom were native Egyptians, three Syrians, one Tunisian, and five orientalists, including A.A. Gibb (Great Britain), Louis Massignont (France), and C. Nallino (Italy).
Only the Iraqi Academy required its members to meet certain qualifications.

Whereas Arabic is the mother tongue of the majority of members in the Arabic academies, Hebrew is a second language for the members of the Hebrew Academy.

The numbers of members varies from one academy to another. When established, the Egyptian Academy had 20 members, the Syrian 8, the Iraqi 14, the Jordanian 8, and the the Israeli 15–23. In a few academies, members are appointed, in others, they are chosen.

In all these language academies, the routine work of language formation and supervision is performed by a number of committees. The Syrian Academy, for example, consisted of two major committees: (1) a literary and linguistic committee, and (2) a scientific committee. The Egyptian Academy, however, had several committees, one for Mathematical and Natural Science terminology, another for compiling terminology in Biology and Social Science, and another in Belles Letters and Arts, to mention few. The committee, often gathers linguistic material in discussion, then classify and analyse it. Later the material is presented to the full academy for further discussion. The suggestions of the committees are well documented and thoroughly researched. In most cases the great majority of the proposed terminology are accepted or modified; few are rejected.

Often, the various committees are assisted by advisers in the field under study. Such advisors are usually seconded by the relevant scientific institutions, professionals, and researchers, who submit lists of scientific words with their etymologies for consideration. The Arabic Language academies made use of the scientific terms coined by linguists and literary men, so did the Hebrew Academy which benefited also from Ben Yehuda’s dictionary (d.1922).

An integral part of the academies' work is the publication of their decisions in the form of complete, specialized, professional dictionaries, terminological lists or system of rules. Studies in the field of Arabic Language and literature and articles relating to the history of the Arabic Language are published in these journals. Leading scholars make contributions to the journals. The Hebrew Academy and the Academy of Damascus also concern themselves with gathering and editing manuscripts and publishing books. The first issues of the Egyptian Academy are particularly valuable, because they contain the minutes of the meetings on coining new terminology. These minutes are an indispensable source for studying the motives for accepting or rejecting new coinages.

Comparing the suggested terms with those accepted show the following:

A. A trend to preciseness, as in accepting al-kammāhah (root meaning -‘restrain’) instead of al-mīzalah for ‘brake train’.

Al-naqqāb (root meaning- ‘to pierce, make holes’) was rejected for the French word “commissaire” (“conductor in the train”) using it for the man who checks the tickets before entering the train. The word
"biologist, 'al-qlimin al-hayawi" was rejected, because 'hayawi' means 'vital'.

B. A limitation of the meaning of words, as in accepting al-sabbag (root meaning - 'exceed') for 'rapid train' instead of al-jaht, because the latter is out of use.

C. A tendency towards giving Arabic terms meaningful meanings as in accepting al-waggaf (root meaning - 'to stand,' 'to stop') for 'omni-bus', because of its slowness and the many stops it makes in stations.

The reason the Syrian Academy rejected the committee's recommendation of laakahiy ('shapeless') for 'amorphous,' and accepting ghawar mutabalwir is because the European distinguishes between 'not crystallized' and 'shapeless bodies.' The Iraqi Academy decided on tasfiyah (root meaning - 'purify'), for 'refining' instead of takrir (root meaning 'do again'), because the literal meaning of 'refining' is 'to refine again,' which the term takrir does not fulfil.

D. Avoiding coining compounds as much as possible.

E. Preference of adopting terms already in use to coining new ones. Because of the widespread use of mawqad it was chosen over waqqad for 'stove.'

The main objects declared by the Arabic and Hebrew academies are basically the same. All the academies agree to revive and preserve the purity of their languages, compile a historical dictionary of their national languages and coin scientific and technological terms.

The methods employed by the Arabic and the Hebrew academies to create new terms show striking similarities. It stands to reason that the similarity between Hebrew and Arabic led to identical means of coining new terms. The main methods may be illustrated as follows:

1. Translation

Translation from English and French to the target language is the most common method. All the academies tried to avoid compound equivalents and multiple meanings. They agreed on that the translated target words should be in agreement with the morphological rules and analogy, and are to be derived from roots found in the literatures. In translating from the source language, one should aim at the essential signification, not the literal meaning of the terms of the source language.

2. Arabization or hebraization - foreign words may be arabized or hebraized, i.e. Transliterate the source word into Arabic or Hebrew letters accordingly. Al-Maghribi, for instance, justifies arabization by saying that it is not an innovation in the Arabic Language nor does the existence of arabized words constitute a foreign element in the language. He further suggested that an arabized word should be capable
of giving new derivations. The same rationale may be found also among members of the Hebrew Academy. Both the Arabic and the Hebrew academies tried to use target words phonetically resembling the foreign words whose meanings they were to take over. Most of the borrowed words are in science, for example:

A. Units of measurement and names of coins, such as: kilometer, liter, meter, Mark, Lira, etc are retained in both Arabic and Hebrew.

B. Electrical units which are named after their innovators: Ampère, Ohm, Watt. These are part of international vocabulary.

C. Sometimes one finds variants where, in addition to the arabized word there is an Arabic equivalent, such as dimughrafiyah and 'ilm al-sukkān for 'demography'; bidāghūghiyyah and 'ilm al-tarbiyyah for 'pedagogy'; sawkara and ammana for 'to insure'.

The academies permitted also to arabize or hebraize words derived from proper nouns, as in bastarah (Ar.) and pistur (Heb.) for 'pasteurization'; ghalwanah (Ar.) and galvanizatzyah (Heb.) for galvanization'. However, in the event of restoring Arabic words from foreign languages, the original Arabic is maintained as in al-hamra' instead of 'alhambra'.

Influenced by the source languages, the Hebrew and the Arabic academies created names of doctrines, philosophies, and political currents from the proper noun: markīsīyyah, līnīnīyyah, and dīghūlīyyah from 'Marxism', 'Leninsm,' and 'De Gaulism' respectively. But in a few cases Arabic madhhab - 'doctrine' was used as in al-madhhab al-rumantīgī for 'romanticism'. Hebrew transliterated the suffix -ism as in markīzm, lenīнизm, and degolīzm respectively.

It should be noted that in borrowing loan words of international character the Arabic academies preferred Arabic equivalents as much as possible, as in biyād for 'nuetrality', while the Hebrew nyutraliyut is hebraized. In the process of arabization and hebraization new sounds with their symbols entered Arabic and Hebrew.

3. Giving a new meaning to old words

Both the Arabic academies and the Hebrew Academy resorted to expanding the vocabulary by referring to ancient sources, especially to works on Medicine, Mathematics, Astronomy, Botany, etc. In many cases, however, they formed new terms for concepts that had already been expressed by other words in the past. This method led to the expansion or limitation of the meaning. Some examples from Arabic:

A. The word istiḵmār had a positive connotation 'cultivation' in the Koran (11:61-64), but it now has a negative one 'colonialism'.

B. Ta'irah naffāthah - 'jet aircraft.' The word naffāthah means 'waste' in the Koran (113:4). Also the current use of qitār
train'; hatif, 'telephone'; bag, 'telegraph'; sayyarah, 'car'; and taslih, 'arming' had different meanings previously.

Now a few examples from Hebrew:

A. The Biblical tzilem, 'image' had been used to form tzilem, 'to photograph'; tatzlum, 'photograph'; matzlema, 'camera,' and tzalmaniyah, 'photographic studio.'

B. In medieval literature, the Hebrew tiyyur stood for 'passport,' but the ancient word darkon, 'coin' was accepted for 'passport.'

C. Moke'im in the Bible means 'trap,' but the Hebrew Academy went along its current meaning for 'mine' (explosive).

As a result of this method, many religious words were given secular contents: This occurred in Hebrew more than in Arabic. Hebrew mossaf, a term used for one of the weekly prayers has become a 'supplement' (of a newspaper), and minhag which stood for a noon prayer has become 'rest.'

4. Composition

Another method which gained considerable acceptance by the Hebrew Academy, and to much less degree by the Arabic Academies, is creating new terms by combining elements of two words (Arabic- maqt). The opposition to restoring to such methods in Arabic is exemplified in the attitude of Dr. Mustafa al-Sihabi, one of the most active members in the Syrian Academy. In many lengthy articles he objects to using composition in coining new terminology, claiming that the new Arabic words are hard to pronounce and that often they are not understood. To prove his point, he gives ample examples taken from recent scientific dictionaries. He says the French 'coleopteres' should be expressed in two words ghimdiiyat al-ajniyat not ghamjiniyyat, because the student does not understand the first part gham of the word ghamjiniyyat. The same may be said about gabtarik, 'prehistory,' which is composed of gabl 'before' and tarikh 'history.' All the Arabic academies, however, agree that composition should be used only when there is a 'scientific need,' provided that the terms coined in this way are pleasant to the ear and clear. Thus we find dawkimya for 'photochemical,' where the glottal stop hamzaah of day, 'light' is deleted when combined with kimya, 'chemical.'

Whereas the Arabic academies limited the usage of composition to scientific terminology, mainly to Chemistry and Physics, the Hebrew Academy expanded its use to other domains. It seems that it followed certain guidelines:

a. Simple composition, as in kolnoa, 'cinema' derived from kol-'sound' and noa-'movement'.

b. Joining elements of two words into one is facilitated by both words having one or more consonants in common, as in kaddur -
ball’ and regel-’foot’ where r end the first word and begins the second. Combining the two words results in kadduregel - ’soccer.’/7

c. Blending a verbal root and a noun, as in ramzor - ’a traffic light,’ from the root rmz - ’to wink’ and or - ’light,’ whose intial glottal stop hamza is elided.

d. Blending of two verbal roots, as in dappor - ’bulldozer,’ which has the roots dbf - ’push’ and hfr - ’dig,’ with the recurring pair h and (f(p) inserted only once. The sequence d,h,f(p),r is left and shaped into a noun with the vowel sequence a,o frequent in Hebrew nouns.

In a few cases, the Hebrew Academy gave sanction to common use of new words coined from contractions and initials. From din ve-heqbon - ’account, report’ first acrostic du’ah came into use, then the verb divah - was formed with the artificial root dvh. Furthermore, initials in Hebrew became independent words as ramatkal - ’Commander in Chief of the Army,’ and asaf - ’P.L.O.’. Such formation of initials are rare in Arabic. English initials NATO, UN are translated into Arabic. Whether the Arabic academies will approve the recent usage of English initials in Arabic as independent words like yunesku or alyunesku - ’UNESCO,‘ opek or alopek for ’OPEC‘ remains to be seen.

5. Derivation

In word formation, the Arabic and Hebrew academies follow the methods inherited from former stages of their corresponding languages. Yet, some possibilities of derivation and combination that in older Hebrew or in medieval Arabic were realized in relatively small measure are now put to use more excessively. The following deserve special mention:

A) Names of diseases. The pattern for the names of diseases, gatelet, already found in Hebrew sources, is applied to form the names of many diseases known to modern medicine. For example, ’tuberculosis‘- sahefet (built on a root meaning ’thin‘) and nazelet - ’cold‘ (root meaning ’to flow‘), etc. were coined by the Hebrew Academy. This pattern became so productive that public wit applied it to parliamentary ’diseases‘ such as sahevet (root meaning- ’drag‘) for ’red tape‘ and dabaret -’talking disease‘. The Arabic academies allowed the patterns fu’al and fa’al, whether they are derived from verbs or not, to be used for names of diseases, as in sudar - ’headache‘; arag - ’insomnia‘.

B) Names of tools. These may be formed in any of the Arabic patterns, mif’al, mif’alah, mif’al, fa’alah. Example include mibrad - ’file‘; mixratah - ’lathe‘; mithqab - ’drill‘ and barrada -’refrigerator.’ The Iraqi Academy allowed another pattern fi’al as in simam - ’valve.’ The Hebrew Academy, however, derived names of tools from the most common patterns maqtel and migelet, as in maghetz - ’iron‘ and mikteret - ’smoking pipe‘.
C) **Scientific words.** The Arabic academies permitted derivation from concrete nouns and substances in sciences, as **mukahrab** - 'electrified' from **kahraba** - 'electricity' and **mumaghnat** - 'magnetized' from **migh~tis** - 'magnet.' Such derivation is widespread in Hebrew, hence the Hebrew academy used it extensively.

D) Both the Arabic and Hebrew academies preferred to derive words from existing roots. In forming words from roots with second character glide (w,y), Hebrew and Arabic differ quantitively. Since Arabic enjoys a rich vocabulary it does not need to create as many new roots as Hebrew does. While Arabic does not create new roots from roots whose second character is a glide by adding prefixes (t,m) or suffix (n), Hebrew does so. This feature was used by the Hebrew Academy to derive the verb **lehatniC~** - 'to start a motor' from **nuC~** - 'movement' and **lemakem** - 'to place' from **gwm** - 'stand'. In order to obtain a Hebrew verb for 'to egyptianize' the verb **mitzer** is created from **mitzrayim** - 'Egypt' in the same way that Arabic did **massara** from **misr** - 'Egypt.'

E) Many of these new Arabic and Hebrew coined verbs are derived from nouns with prefixed or suffixed formatives, thereby new roots mostly quadiliteral have entered these languages. For example, **mirkez** (Heb.) or **markaza** (Ar.) - 'to centralize,' with the passive participle **memurkaz** (Heb.) or **mumarkaz** (Ar.). The Hebrew pattern **ptar** and the Arabic **f~ala** are the most productive.

F) the Arabic academies expanded the use of **at** attached to scientific terms, as in **lasilk1** - 'wireless' or **l~markazi** - 'decentralized.' They also allowed the use of **yuC~ al-nisbah** with broken plurals as in **bim~iyyaC~** - 'acidity' and **~ass~siyyah** - 'sensitivity.' The Hebrew Academy, on the other hand derived many nouns and adjectives from a noun basis by adding suffixes such as **-an** for the masculine (mahpexan - 'revolutionary') and **-anit** for the feminine. It revived the suffixes, **-ay** for the masculine and **-it** for the feminine (**Citonay, Citona**) - 'journalist.'

It is worth mentioning that the Arabic academies made no use of other Semitic language in coining new terms. The Hebrew Academy, however, accepted Aramaic words provided they were reshaped to fit Hebrew patterns and grammar. For example, the Aramaic **c~ovada** (m.) - 'fact' became **c~uvdah** in Hebrew, changing both its vocalization and gender. The Hebrew Academy approved some terms after the Arabic **ghararabl~** - 'cressa' (Heb. **carar**); **sahlab** (Ar.) - 'orchis' (Heb. **sahlab**) and the Arabic **kummah** - 'skullcap' is Hebrew **kumtah** for 'beret.'

**Latin and Greek Prefixes and Suffixes**

Following are a few examples on treating these prefixes and suffixes:

A) Prefixes
   a. Hyper
Most Arabic academies translated this prefix to \textit{fart} as in \textit{fart al-daght}, 'hypertension.'

\begin{itemize}
  \item[b.] Hypo
  The Egyptian Academy translated it into \textit{habt}, while the Iraqi Academy chose \textit{hat} as in \textit{hat al-daght} for 'hypothyroidism'. The Hebrew Academy borrowed the Aramaic prefix \textit{tat}, as in \textit{natran tat kloriti} - 'sodium hypochlorite'.
  \item[c.] Re
  This prefix was translated to many words by the Arabic academies: \textit{awdah, i'adhah, kar} and \textit{thaniyatan}.
\end{itemize}

\textbf{B) Suffixes}

\begin{itemize}
  \item[a.] Ible and Able
    The Hebrew Academy produced dozens of adjectives indicating possibility. They are something like English adjectives in \textit{-able} and \textit{-ible}: \textit{savir} - 'breakable' and \textit{gamiš} - 'flexible' (pattern \textit{gatil}). This academy also coined such adjectives with passive participle, as in \textit{mitaitel} - 'portable', or combined \textit{ben} or \textit{bar} with abstract nouns, as \textit{bar bitul} - 'abolishable' and \textit{ben halaf} - 'passable.' The Egyptian Academy, however, preferred the traditional way by using the passive imperfect, as in \textit{yu'kal} - 'eatable'; \textit{yu'krab} - 'drinkable.' In the dictionaries published by the Arabic academies, one finds in addition \textit{gābil li} and \textit{sālih li} followed by the verbal noun e.g., \textit{sālih lilqurb} - 'drinkable'; \textit{gābil lil'indighāt} - 'compressible'. The Iraqi Academy used the active participle too: \textit{mun'izim} - 'adjustable.'
  \item[b.] Ate
    Suffix \textit{-ate} is arabized, e.g. \textit{labanāt} (EA), 'lactate'; \textit{kibritāt} (IA), 'sulphate' and \textit{fahmat} (SA), 'carbonate.' The Hebrew Academy used, however, the common suffix \textit{ati}, as in \textit{natran klorati} for 'sodium chlorate.'
  \item[c.] Ite
    This suffix is arabized in Chemistry but in medical terms it is translated to \textit{iltihāb} as in \textit{iltihāb al-mafāsil}, - 'arthrite' (Fr.). Hebrew has the the suffix \textit{iti}, e.g. \textit{natran kloriti} - 'sodium chlorite.'
  \item[d.] Oide
    In most cases \textit{oide} is translated by the Arabic academies into \textit{šibh} as in \textit{šibh gharawi} (also found in a composition \textit{šibgharawi}) for 'colloide'. The Iraqi Academy also employed the suffix \textit{k} as a prefix: \textit{kalgāli} for 'alkaloide'.
  \item[e.] Scope and Meter
\end{itemize}
Suffixes `scope` and `meter` are translated into Arabic into kāṣif (kāṣif al-lūk, `radioscope`) and miqyas (miqyas al-folt, `voltmeter`) respectively, but mostly the Arabic term is a single word in the pattern of miṣṣal, e.g. mijāhar `microscope`. In Hebrew such terms ending in `scope` and `meter` are hebraized: elektrōskop for `electroscope` and elektrōmeter for `electrometer`.

It seems from the above that the Arabic academies translated most of the prefixes and suffixes into Arabic equivalents, yet they produced many variants for the same prefix or suffix. The Hebrew Academy, however, used Hebrew and Aramaic prefixes and suffixes, hebraized the foreign terms or translated them.

It should be mentioned that these differences among the Arabic academies do not exist only in their treatment of Latin-Greek prefixes and suffixes, but also are reflected in the terminology they coined in various fields of knowledge. Examples follow:

- "pendule": raqqās (Iraq), bandūl (Egypt), nawās (Syria).
- "Acceleration": ajalah (Egypt), isrā‘ (Iraq).
- "Calorie": su‘r (Egypt), Hurayrah (Syria).
- "Physics": ilm al-tabī‘ah or al-fizyā‘ (Egypt), al-fizyā‘ (Syria and Iraq).
- "Court of Cassation": mahkamat al-tamyīz (Syria), mahkamat al-naqād wil‘ibrām (Egypt).
- "Constitution": dustūr (Syria and Egypt), qānūn asāsi (Iraq).

More such examples, may be found in the fields of Military, Administration, Philosophy, History, Sociology, and Anthropology Arabic terminology. The main causes for the diversities of Arabic terminology go back not only to the multiplicity of synonyms in Arabic and lack of coordination among the Arabic academies, but also to the following factors:

A) Multiplicity of linguistic sources. English and French are the prime source languages. When these languages have different terms for the same concepts, Arabic has two variant terms for the same concept, e.g., niṭrūjīn and azūt are transliteration of `nitrogen’ (Eng.) and `Azote’ (Fr.).

B) Duplication of terminology in the source language, e.g., ‘electronic tube’ in American English, is ‘electronic valve’ in British English. Arabic has unbubah elektrōniyyah and simām elektrōni respectively.

C) Synonyms and polysemous words in the source languages. For example, there are two phrases for ‘hand pump’ in French: ‘pompe à bras’ and ‘pompe à main.’ This results in Arabic minfāx bildhirā‘.
Despite the issuing of standardized English-French-Arabic dictionaries by the Coordination Bureau of Arabization, the question of standardizing Arabic terminology remained unresolved. Many suggestions have been offered to the problem of unifying the scientific terminology in the Arab world. One suggestion says to establish a central computerized terminology bank, another tries to enforce the usage of the unified terminology by law, believing that all needed is Arab commitment. But all these suggestions treat standardization of Arabic terminology from a political point of view. They consider that the multiplicity of Arabic academies and the different terms they produce for the same concept are damaging to Arab solidarity and undermining Arab unity.

The problem of Arabic terminology lies chiefly in assuring that new terms gain acceptance at the press, universities, and vocational schools, and in creating more advanced society for them.

Notes
1. About the various activities of this Bureau, see LA, Vol.10, Part 2, Rabat, 1973, pp.15-36.
2. These terms were discussed in Majma' al-Lughah al-'Arabiyyah al-Malaki, Vol. 2, Cairo, 1937, pp.200-201.
3. Ibid., p.203.
12. Yehushua Blau, Tehiyat Ha'ivrit u-Tehiyat Ha'aravit Hasifrutit,
Jerusalem, 196, p.104-105.


22. MMII, Part 17, Baghdad, 1969, p.34.


29. Ibid., p.118.


34. Ibid. See also Monteil, op. cit, p. 146.

35. See note 32.

36. Ibid.


39. Ibid.


42. Ibid., p. 19.

43. Ibid.


Abbreviations

Ar. = Arabic
EA = Egyptian Academy
Eng. = English
Fr. = French
Heb. = Hebrew
IA = Iraqi Academy
LA = Al-Lisan al-‘Arabī
MMIAD = Majallat al-Majma‘ al-‘Ilmī al-‘Arabī Bidimaṣq
MMII = Majallat al-Majma‘ al-‘Ilmī al-‘Irāqī
MMLA = Majallat Majma‘ al-Lughah al-‘Arabiyyah
MMLAD = Majallat Majma‘ al-Lughah al-‘Arabiyyah Bidimaṣq
SA = Syrian Academy

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WHAT DO DEFINITIONS REALLY TELL US ABOUT MEANING?

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I. Introduction

On numerous occasions as an elementary school and junior high school student, I had an experience which I am sure we can all reflect upon as having had. One of my fellow classmates would make a statement containing the word "ain't." At that point, he would be cut short in his speech by another of my classmates who would proclaim with the utmost certainty, "ain't ain't a word!" Perhaps he was trying to demonstrate his great linguistic prowess to an obviously unlettered associate who would dare to use the word "ain't," or perhaps he was simply pointing out the social impropriety of such a usage. Whatever the case, the person who dared to utter "ain't" in the scholarly setting of a junior high school would inevitably retort, "it's in the dictionary." This assertion would, of course, spark interest in an immediate and full investigation of the subject. We would march to the dictionary to obtain the mind and will of Noah Webster on the subject, each of us certain that Webster would vindicate our respective positions. To the chagrin of some and to the delight of others, we would locate the following entry:

ain't. la. are not. b. is not. c. am not. though disapproved by many and more common in less educated speech, used orally in most parts of the U.S. by many cultivated speakers esp. in the phrase ain't I.

That concluding disclaimer notwithstanding, one thing was now beyond dispute: "ain't" was in fact a word! As we read that entry in Webster's volume, it was as if we had heard the great King Solomon himself urge us, "let us hear the conclusion of the whole matter;" for so it was.

This simple experience deserves some thoughtful consideration. Isn't it amazing how profoundly the dictionary affects the language of a community? Granted, the lexicographer's intent is more to describe words and their uses than it is to dictate to the masses what they can and cannot do with words. Nevertheless, when we descend from the clouds of academia long enough to plant our feet firmly on the ground, we come to realize that more often than not, academia's findings constitute the marching orders for the waiting world of laymen below. This is especially true of the dictionary. After all, when one wants to know how to spell, pronounce, or use a word, the dictionary is consulted. Moreover, in the vast majority of cases, one believes whatever the dictionary says. Perhaps, then, we as professional linguists should view it as our moral obligation to provide the members of our language community with an objective and meaningful view of the language we share. The purpose of the present study is to investigate some new avenues of approach to the highly practical problem of defining words.

II. Word Definition in History

Interest in the definition of words is by no means a recent phenomenon. The first known English monolingual glossary grew out of the desire of the sup-
porters of the Reformation that even the most humble Englishman should be able to understand the scriptures. In his 1530 edition of the Pentateuch, William Tyndale included "a table expounding certyne wordes." The following entries are typical:

Boothe, an housse made of bowes.
Consecrate, to apoynte a thinge to holy uses.
Slyme was . . . a fattenesse that oseed out of the erth lyke unto tarre/
And thou mayst call it cement/if thou wilt.
Vapor/ a dewymiste as the smoke of a sethynge pott. 3

The first purely English dictionary to be published as a separate work appeared in London in 1604. The most famous of the early English dictionaries, however, was published by Samuel Johnson in 1755. It was a monumental work for that age, containing some 43,500 entries and 118,000 illustrative quotations in two volumes. 4 Nevertheless, Johnson's Dictionary came under criticism because of the obviously subjective character of some of his definitions. For example, Johnson defines "oats" as "a grain, which in England is generally given to horses, but in Scotland supports the people." 5 Moreover, botanist and layman alike would encounter difficulty in identifying oats from Johnson's taxonomic description: "It is of the grass leaved tribe; the flowers have no petals, and are disposed in a loose panicle: the grain is eatable."

Noah Webster's famous American Dictionary of the English Language of 1828 more or less constituted the first recognition given by lexicography that British English and American English were different to the extent that American English required a separate dictionary. As a natural consequence of this recognition, Webster endeavored to describe words in a way that would be most meaningful to Americans.

"The supreme completed achievement in all lexicography," however, is The Oxford English Dictionary. The efforts which culminated in its publication were begun in 1857 and completed in 1928. 6 Anyone familiar with The Oxford English Dictionary knows that it is not at all unusual for a single entry to continue for several pages and to list scores of contextual environments in which the entry word has attested usage. This, on a smaller scale, of course, is the pattern for all dictionaries. Those things which we commonly refer to as definitions are, more often than not, simply statements of contextual environments in which the word is known to be used; and, since the time of Tyndale, the number of contexts typically listed for each word has significantly increased. This easily demonstrable fact constitutes the focal point of our present concern. The dictionary itself suggests that a "definition" as found in the contextual environment of a dictionary is "a statement of the meaning of a word." 7 Is it possible that, in the vast majority of cases in modern dictionaries, we are simply stating the contexts in which a word may be used, or in which its referent appears, without really isolating the meaning of the word itself? Perhaps an example would be helpful at this point. One might say that a "hot dog" is a foodstuff which appears in the contextual environment of fast food restaurants, airports, bus stations, shopping malls, and carnival concession stands, as well as family picnics. This observation would be true, and it would be part of the meaning of "hot
dog." Nevertheless, when we hear the mention of the word "hot dog," we all see in our minds' eye a picture of a hot dog that is not constrained to any particular context, but which is still adequate to allow us to identify a hot dog whenever we see one in the referential world.

II. A Possible Solution

It may be argued that meaning is simply the sum total of the contextual environments in which a linguistic form appears. If that is so, then why not include in our dictionary entries a single statement which summarizes that sum total of meaning as delimited by the contexts in which the form is known to appear?

Saussure, Van Schooneveld, Jakobson, and other stellar figures of linguistics have suggested that all words can be expressed as the union of two properties: the signans, which is the mental construct of the word (and not the word on paper or in the air), and the signatum, which is the mental construct of the thing specified by the word in the real world (and not the meaning itself). This is called the Linguistic Sign.

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**For example, let us consider the word "tree."** We could represent its linguistic sign thusly:

"the signifier:" not the word itself, but the mental construct which has its realization as the word "tree."

"the signified:" not a specific tree, but the acontextual mental construct which designates a tree and separates it from other things in the real world (thus distinguishing it from, for example, ocean liners, tacos, and dishwashing liquid, etc.)
Because the signifier is linked inseparably and acontextually to the signified, it would seem reasonable to suggest that there exists a common thread of meaning which binds the two components of the sign together. This common thread of meaning is called, in the terminology of Roman Jakobson, "the invariant." Concerning this invariant, let us consider the following important observations.

1. When one utters the word "tree," in or out of context, the mental construct which the word represents is comprehended by all members of the speech community. Hence, for all practical purposes, it is fair to think of the word "tree" as the real world manifestation of the idea of "tree."

2. When one points to any number of trees in the real world, each of which is merely a specific contextual example of the abstract notion "tree," all members of the speech community can still make the connection between the plant form they see with their eyes and the mental construct "tree" they comprehend in their minds.

3. Therefore, it ought to be possible, in principle at least, to state in words, in the form of an "invariant definition," the essence which ties the word "tree" with its referents in the real world.

For our purposes, then, we will identify the various components of the linguistic sign as follows:

As we have noted, modern dictionaries list as definitions multiple contextual environments in which a word is known to appear. Hence, each word is represented as having several different definitions or, in other words, as meaning several different things. The unavoidable consequence of this atomization is, in the words of Roman Jakobson, that

the relation between sign and meaning is lost and questions of meaning are wrongly eliminated from the theory of signs . . . Semantics,
very core of linguistics and of sign theory in general is thus deprived of an object of inquiry, and we are left with such grotesque results as morphology which never refers to the meanings of forms.

Therefore, in order to understand what a word really means, it seems desirable to set forth a general invariant definition which would apply to the word in any given context, regardless of the syntactic category in which the word might be used. Such an invariant definition would have the effect of uniting all statements of the word's contextual usage under one definition which pervades all contexts:

Concerning the nature of the invariant, Linda Waugh, of Cornell University, has observed the following:

In order to extract such an invariant, one must take a sufficiently abstract view of the form in question— one cannot simply equate its meaning with any one usage nor with its interpretation in given contexts. The meaning . . . cannot contradict any one contextual usage, but neither can it be equated with any one contextual usage.

IV. The Central Problem

In keeping with the criteria stated above by Linda Waugh, invariant definitions have been written for a few words. The words have primarily been so-called "function words," such as prepositions. The process typically followed for formulating invariant definitions includes:

1. Identifying as many contextual environments for the word as possible, and

2. formulating by logic, intuition, or plain guesswork a definition
that seems to incorporate all of the contexts previously identified.

None need be surprised at the apparent sloppiness of this method, for it is nothing more or less than the well-known scientific method that has been used in all sciences since the days of the 13th century probabilists. Hence, the methodology for identifying invariants is not an issue here. Moreover, it is really not a problem to come up with a definition that is sufficiently abstract so as to encompass all contexts. For example, we could, in the extreme case, define the word "up" as "a function word that shows a relationship between physical or abstract entities." That definition would certainly cover any and all conceivable contexts in which the word "up" could appear. Unfortunately, it would also apply to "down," "inside," "beside," etc. Hence, there arises an important question at this juncture: Is it, in fact, possible to write an invariant definition that is sufficiently abstract so as to apply to any and all contexts in which a word can appear, but that is sufficiently restricted so as to apply to that word alone? Alternatively stated, what is the relationship between the sum total of the meaning expressed by $W$ and the sum total of the meaning accounted for by $I$?

To illustrate this, we will represent the universe of linguistic meanings expressible by language $A$ as a geometric plane:

We will assume that every $W_x$ of language $A$ occupies a specific semantic territory within the plane. By "semantic territory" we mean the exhaustive list of standard dictionary definitions that are applied to $W_x$. Hence, we may say that the semantic territory intuitively defines the use of $W_x$ within the language. Some of these semantic territories will overlap with the semantic territories of other words with which they exist in a hierarchical relationship:
With each semantic territory there is an associated $I_x$ which, by definition, pervades at least the entire territory. In other words, $I_x$ is one definition which covers all the standard dictionary definitions applicable to $W_x$.

Given the semantic territory $W_x$

![Diagram of semantic territory $W_x$]

and the semantic territory of meaning accounted for by $I_x$

![Diagram of semantic territory $I_x$]
there could logically exist four different relationships between $W_x$ and $I_x$.

**Possibility #1:** The territory of $W_x$ and $I_x$ could perfectly overlap.

In this case, $I_x$ accounts for all the meaning of $W_x$ and only for the meaning of $W_x$.

**Possibility #2:** $I_x$ could be larger than $W_x$.

In this case, $I_x$ is useful as a descriptor of the semantic meaning had in common by all contexts in which $W_x$ occurs; but it does not provide sufficient information to identify $W_x$ as a unique semantic entity.

**Possibility #3:** $W_x$ could be larger than $I_x$. 
This is what most laymen would perceive to be the relationship between W and I. In this case, there are some aspects of the meaning of Wx that are not accounted for by Ix. This possibility, however, is disqualified by virtue of the definition of invariance which, given acceptance of the definition, requires that Ix pervade at least the entire semantic field of Wx.

Possibility #4: There is no intersection whatsoever between Wx and Ix.

This possibility is simply a special case of why we rejected Possibility #3; and we reject Possibility #4 on the same grounds. Even a standard dictionary, which associates specific meanings with specific words refutes this possibility.

Our present concern, then, is to determine whether the nature of invariant definitions, as they are presently written, are more correctly characterized by Possibility #1 (in which Wx and Ix exactly correspond) or by Possibility #2 (in which Ix is larger than Wx).

V. Methodology

In order to draw some conclusions as to which of the two competing possibilities more correctly reflects the nature of the invariant definition, Dr. Alan K. Melby of Brigham Young University's Department of Linguistics, together with the present author, developed a test which was administered during January, 1984, to 113 college students enrolled in English 115, College Reading and Writing (freshman composition). The students were presented with a paper containing the prepositions "to" and "with."

With each of these prepositions was listed

1. a proposed invariant definition,

2. three examples of divergent contexts in which the preposition could typically occur, and

3. an explanation following each contextual example of how the invariant definition could be applied to that context.

Next, the students were confronted with the following problem.

We have just applied both definitions to three very different contexts. Is it possible, however, that the definition we listed for
"to" could just as easily be used as the definition for "with?"
On the other hand, is it possible that the definition we have
listed for "with" could just as easily be used as the defini-
tion for "to?" You be the judge.

On the next page, the students were given the following instructions:

DO NOT GO BACK TO THE FIRST PAGE. (This instruction was included
in order to reduce the number of potential cases of mechanical
association of the definitions with the sentences.)

Below are two sentences containing "to" and two sentences containing
"with." At the bottom of the page are the two definitions you have
already seen. One definition is marked A and the other definition
is marked B.

Think about the meaning of the underlined "to" or "with" in each
sentence. If you think definition A best defines the underlined
word, write A in the blank beside the sentence. If you think de-
finiteion B best defines the underlined word, write B in the blank
beside the sentence. However, if you think that either definition
A or B would define the underlined word equally well, write AB in
the blank beside the sentence.

The students were then presented with four sentences. The first and third
sentences contained the word "to" and the second and fourth sentences con-
tained the word "with:"

1. Jack and Jill both decided to get a pail of water.
2. Mike is a man with a hot temper.
3. The solution you propose is fine to me.
4. Sue bought the house with the money she borrowed.

The definitions were listed as follows:12

A a word that relates two ideas such that one idea is viewed as
existing in a fitted, shaped relationship with the other idea

B a word that relates two ideas such that both ideas are seen as
participants in the same verbal action

AB either of the above definitions could be used to define the
underlined word equally well

The students were then given ten minutes in which to complete the task.

VI. Results

We will summarize the results of the instrument sentence by sentence:13

Sentence #1: "Jack and Jill both decided to get a pail of water." This
was clearly a context in which "to" fit better than "with." Fifty-eight per cent of those surveyed associated the proposed definition for "to" with this sentence. Thirty per cent said that the definition for "with" better described "to" in this sentence, while only twelve per cent believed that both definitions applied equally well.

**Sentence #2:** "Mike is a man with a hot temper." This was clearly a context in which "with" fit better than "to." Nevertheless, the distinction between the definitions was not so clear. Only forty-four per cent agreed that definition B actually fit "with" the best, while forty-six per cent felt that the definition intended for "to" better defined "with" in this context. Ten percent said that either definition would work equally well.

**Sentence #3:** "The solution you propose is fine to me." Here, it must be admitted that either "to" or "with" could have fit in this sentence. Of course, the central issue here remains whether or not the definition for "to" applies to the underlined word in the sentence. Nevertheless, it is possible that the survey population was confused on this point; fifty per cent of them said that either definition A or B would define the underlined word equally well. Thirty-five per cent selected definition A and twenty-one per cent selected definition B.

**Sentence #4:** "Sue bought the house with the money she borrowed." Here, "with" clearly fits this sentence better than does "to," and the data supports this claim. Fifty-three per cent selected definition B while only twenty-five per cent selected definition A. Twenty-two per cent said that either definition would work equally well.

**VII. Discussion**

An analysis was also done of the eighty-one possible combinations in which the answers could have occurred. Forty-one of these possible letter combinations appeared in the data. The four-letter combinations referred to below are the answers given to sentences one through four respectively. AB will be listed as C to alleviate confusion.

Of particular interest were the answer sequences ABAB, ABCB, and BACA.

Nine individuals listed ABAB as their answer sequence. That means that only eight per cent of those surveyed matched the prepositions with their definitions exactly as intended by the authors of the survey. However, nineteen per cent listed the sequence ABCB, thus agreeing with the survey authors in every case except sentence #3. Again, this can potentially be explained by the fact that both "to" and "with" could have fit in that context. If we discount sentence #3, then, twenty-seven per cent agreed with the authors exactly as pertaining to sentences #1, #2, and #4. This constitutes the largest single group out of the 113 respondents. Along these lines, however, we are confronted with a puzzling set of answer sequences: BAAA, BABA, and BACA. Discounting sentence #3, thirteen per cent of the respondents completely disagreed with the authors in sentences #1, #2, and #4. Hence, the largest single group of respondents (27 per cent) were completely successful in matching invariant definitions with their referents in cases where context clearly did not overlap, while the second largest group of respondents (13 per cent) were totally unsuccessful in matching word and definition.
The very fact that a plurality--although not a majority--of the respondents were able to use invariant definitions to discriminate meaning suggests that invariant definitions could potentially be refined to the point that a significant majority of the language community could use them to discriminate meaning. Admittedly, this exists, for the present at least, as a mere theoretical possibility. It is possible that improved definitions or more training time for their users could significantly improve the usefulness of these definitions.

Heretofore, a serious attempt to define words in invariant terms has only been made with function words (like prepositions) and some bound morphemes (like -ly, -ed, and un-). The limited experimentation that has been done in an attempt to define "content words" (such as nouns, verbs, and adjectives) has proven the task to be a very difficult one.

There are other barriers which must be overcome. How, for example, will we define abstractions such as "love," "hate," or "mercy," or ethical notions such as "goodness," "justice," or "truth?" Philosophers, judicial officers, and legislators, etc., daily struggle with the problem of defining these notions, even in terms of specific contextual environments! The current method used for isolating the invariant requires general agreement on what the possible contextual environments are before work can even begin on developing a definition. Moreover, how will we begin to define words that have both scientific and lay contextual definitions (like "salt" or "atom")? These problems are not by any means insurmountable (given the assumption that words can indeed be defined at all); but they are problems which, as our present experiment seems to indicate, will have to be addressed.

Sentence #3 raises some very interesting questions. While it, in and of itself, does not prove that the semantic territory covered by \( W_x \) does not exactly correspond with the semantic territory covered by \( I_x \), it does introduce the possibility that two words \( W_x \) and \( W_j \) and their respective invariant definitions, \( I_x \) and \( I_j \) could overlap in the following manner:

![Overlap Diagram]

Such a model could account for the results obtained in sentence #3. Also, this model would account for the appearance of synonomy in specific contextual environments, without requiring that two words \( W_x \) and \( W_j \) be considered as synonyms themselves.
VIII. Conclusions and Recommendations

A millennium ago, men had to get the equivalent of a university education in order to learn how to multiply and divide. Now, these arithmetic functions are taught in the early years of elementary school. Perhaps a century or so from now it will be commonplace to own a dictionary whose entries contain:

1. the word's spelling,
2. its pronunciation,
3. its invariant definition, and
4. a representative list of contextual environments in which the word is attested to have appeared.

The present author frankly admits that because of constraints resulting from budgetary limitations, the size of populations available for sampling, and the general state of present research involving the idea of invariance, this study is a preliminary one at best. Nevertheless, we consider the present data to be sufficiently interesting to warrant the continued investigation of the questions introduced here; and indeed, we welcome the development of experiments which would either confirm or refute these findings. Whatever the case, one thing beyond question is the fact that any unified theory of semantics will ultimately have to deal with the issue of invariance. When that happens, linguistics will be required to take a position on the relationship between invariance and word definition. If, in that future day, we can use the idea of invariance to increase the usefulness and comprehensibility of definitions, we will have made a great contribution toward improving the basic language tool that linguists and all literate members of the speech community have in common: the dictionary.
NOTES


2Ecclesiastes 12:13.


4Ibid.


9This statement on invariant definitions involves an important assumption concerning the idea of synonymy. We will define a "synonym" as any word $W_j$ that could replace $W_x$ in any and all contexts in which $W_x$ could appear, without affecting the meaning of the syntagmatic string which composes the contextual environment of $W_x$. Therefore, $W_j$ is a synonym of $W_x$ if and only if $W_j$ can be used completely interchangeably with $W_x$ in any and all contexts. We will state, by definition, that $W_x$ has no synonyms.


11See Appendix 1 for a copy of the survey instrument, along with a copy of the instructions given to those BYU faculty members who administered the instrument.

12It is not our purpose here to provide a lengthy defense for the correctness of the proposed invariant definitions. The definition for "to" is presented and defended by the present author in a treatise entitled, "The Meaning of 'To'," published in Proceedings of the Eighth Annual Symposium of the Deseret Language and Linguistics Society, 1982.

The definition for "with" is the result of research by Dr. John S. Robertson of the Department of Linguistics, Brigham Young University. For the purposes of the present study, we will accept these definitions as "given" and as representative of the current state of research in the area of invariant definitions.
See Appendix 2 for a tabulation of the survey results.

See Appendix 3 for a tabulation of these data.
APPENDIX 1

The following is a copy of the survey instrument given to 113 students enrolled in English 115, College Reading and Writing (freshman composition) in January, 1984.

The first page is a copy of the instructions given to the English Department faculty members selected to administer the survey to their students. The next two pages are copies of the survey instrument itself.
PLEASE READ THESE INSTRUCTIONS TO THE STUDENTS PARTICIPATING IN THIS STUDY:

PLEASE READ ALL INSTRUCTIONS AND EXPLANATIONS VERY CAREFULLY AND ANSWER THE FOUR QUESTIONS ON THE SECOND PAGE. PLEASE BE SURE TO ANSWER ALL QUESTIONS.

YOU HAVE TEN MINUTES IN WHICH TO COMPLETE THIS EXERCISE.
Have you ever tried to define a preposition? Below are two prepositions, along with their definitions.

**TO** - relates two ideas such that one of the ideas is seen as existing in a fitted, shaped relationship with the other idea.

**FOR EXAMPLE:**

"John rode **to** the city." (John's riding is adapted, fitted in such a way that he will, if he continues on the present course, arrive at the city.)

"Sue's speech was **to** the point." (Sue adapted her speech so that the object of her speaking was clear and unmistakable.)

"Bob eats **to** live." (Bob's eating habits are adapted, fitted so that his eating is sufficient only to keep him alive.)

**WITH** - relates two ideas such that both ideas are seen as participants in the same verbal action.

**FOR EXAMPLE**

"John fought bitterly **with** his partner." (John and his partner participated in fighting which involved both of them at the same time.)

"Sue ran **with** only the greatest of effort." (Sue's running involved, at the same time, a degree of effort without which she could not run.)

"Bob left money **with** his mother." (Bob's leaving occurred in such a way that his money and his mother were participants in his leaving at the same time and to the same extent.)

We have just applied both definitions to three very different contexts. Is it possible, however, that the definition we have listed for "**to**" could just as easily be used as the definition for "**with**"? On the other hand, is it possible that the definition we have listed for "**with**" could just as easily be used as the definition for "**to**"? You be the judge:

TURN TO THE NEXT PAGE
Below are two sentences containing "to" and two sentences containing "with." At the bottom of the page are the two definitions you have already seen. One definition is marked A and the other definition is marked B.

Think about the meaning of the underlined word in each sentence. If you think definition A best defines the underlined word, write A in the blank beside the sentence. If you think definition B best defines the underlined word, write B in the blank beside the sentence. However, if you think that either definition A or B would define the underlined word equally well, write AB in the blank beside the sentence.

_______ Jack and Jill both decided to get a pail of water.

_______ Mike is a man with a hot temper.

_______ The solution you propose is fine to me.

_______ Sue bought the house with the money she borrowed.

A a word that relates two ideas such that one idea is viewed as existing in a fitted, shaped relationship with the other idea

B a word that relates two ideas such that both ideas are seen as participants in the same verbal action

AB either of the above definitions could be used to define the underlined word equally well

THANK YOU FOR YOUR PARTICIPATION
APPENDIX 2

The following table summarizes the raw data obtained from the survey.
### Definitions

<table>
<thead>
<tr>
<th>113 Respondents</th>
<th>Sentences</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>1. Jack and Jill both decided <strong>to</strong> get a</strong> pail of water.**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>65 (58%)</td>
<td>34 (30%)</td>
<td>14 (12%)</td>
</tr>
<tr>
<td></td>
<td><strong>2. Mike is a man with a hot temper.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>52 (46%)</td>
<td>50 (44%)</td>
<td>11 (10%)</td>
</tr>
<tr>
<td></td>
<td><strong>3. The solution you propose is fine <strong>to</strong> me.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>35 (31%)</td>
<td>21 (19%)</td>
<td>57 (50%)</td>
</tr>
<tr>
<td></td>
<td><strong>4. Sue bought the house <strong>with</strong> the money she borrowed.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>28 (25%)</td>
<td>60 (53%)</td>
<td>25 (22%)</td>
</tr>
</tbody>
</table>

**A** a word that relates two ideas such that one idea is viewed as existing in a fitted, shaped relationship with the other idea

**B** a word that relates two ideas such that both ideas are seen as participants in the same verbal action

**C** either of the above definitions could be used to define the underlined word equally well.
APPENDIX 3

The following table lists the eighty-one possible letter combinations which could have occurred as answers on the survey instruments. Beside each four-letter combination is listed the number of times in which a respondent selected that letter combination as an answer sequence for matching sentence and definition.

<table>
<thead>
<tr>
<th>Letter Combination</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABCD</td>
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</tr>
<tr>
<td>ABCD</td>
<td>11</td>
</tr>
<tr>
<td>ABCD</td>
<td>12</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Possible Answer Combinations</td>
<td>Number of students responding with answer combination</td>
</tr>
<tr>
<td>------------------------------</td>
<td>------------------------------------------------------</td>
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<tr>
<td>Possible Answer Combinations</td>
<td>Number of students responding with answer combination</td>
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<td>-----------------------------------------------------</td>
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<tr>
<td>Possible Answer Combinations</td>
<td>Number of students responding with answer combination</td>
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THE DIFFERENTIAL EFFECT OF PRECEDING AND FOLLOWING CONTEXT ON GUESSING IN READING

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Brigham Young University

Debra Smith
Marble Falls, Texas

Rationale for the Study

If one is to succeed in the modern world, the importance of reading in one's native language is self-evident. To any engaged in science, technology, and many other fields of endeavor, the importance of reading in English is just as self-evident. A huge percentage of all the information about those subjects published anywhere in the world is published in English. As a consequence of these circumstances today, some of the most important skills that ESL teachers need to help their students acquire are the skills of reading. For this reason, a great deal of time and a great many materials are devoted to the increasing of reading speed or reading comprehension, or both.

However, in the midst of a great amount of work in the development of methods and materials for teaching ESL reading, several researchers have mentioned a noticeable gap in the development of a viable theory to explain how reading in a second language takes place. (Eskey, 1973; Harris,
The research reported in this paper, while not in any way claiming to provide a comprehensive theory of second language reading, was designed to help provide data which might be used in the development of such a theory. It specifically explores whether aspects of theories developed to explain reading in the native language can also be applied to help explain reading in a second language—in this case, ESL.

The model of reading in the native language that we have chosen to explore in ESL reading is that of Kenneth Goodman. Goodman (1970) has proposed that reading is "a psycholinguistic guessing game." In this theory, Goodman claims that reading involves tentative information processing. Readers interact with a graphic text using the strategies of sampling, predicting, confirming, and correcting to construct meaning. They process graphophonic (graphic, phonological, and phonic), syntactic, and semantic cues simultaneously and interactively, as they use these strategies. The reading process involves visual, perceptual, syntactic, and semantic cycles, each interlocking (Goodman and Dollasen, 1960, 9-10).

Goodman (1970) also states succinctly that "Expectations are formed about input and meaning that lie ahead" (p. 508). If reading really is a "psycholinguistic guessing game" as Goodman proposes, then good readers ought to be better guessers; they ought to have more accurate expectations about what lies ahead. This is an idea that can be tested for both native readers and ESL readers. Related to it and possibly of even more practical import is the question about
how the guesses are made. If it should prove true that good readers are better guessers than poorer readers, what difference is there in the way the guesses of the two groups are being made. The answer to this question could be of value to methods and materials developers as they try to teach those skills which will provide the optimal access for their students to the vast body of literature written in English.

The purposes of the research reported here, then, are threefold. In a general sense, the research is designed to see if a model explaining reading in a first language can be used to explain reading in a second language. More specifically, it is designed to see if Goodman's hypothesis that good readers are good guessers can be proven true for both first and second language readers. Finally, the study is designed to see if the predicting strategies of second language readers are like the strategies of first language readers.

**Review of Literature**

Several researchers in reading have suggested that the answer to the question of whether good readers are good guessers is a definite "yes." (See Murray, 1976, for example.) In fact, the idea has become so well accepted that reading skill is often determined by a cloze test—a form of test in which the reader "guesses" what words deleted from a passage would be. The use of cloze passages
are advocated by some as a means of determining the reading ability of students (e.g., Clarke, 1930; Oller, 1972) and by others as a means of determining the readability of a passage (e.g., Anderson, 1971; Paulston and Bruder, 1976). Both uses are related and both point to a general acceptance by practitioners of the idea that reading and guessing are related.

With regard to what the predicting strategies of both first and second language readers are, Cziko (1978) has shown that L1 and L2 readers at advanced levels seem to make use of the same linguistic constraints while the lower and intermediate readers use the semantic restraints less. The lower level L2 readers also make less use of discourse constraints. Clarke (1980) compared the strategies of good and poor readers in their native language (in this case, Spanish) and in their second language (English). He found that in the first language, good readers made more use of semantic cues while poor readers made more use of syntactic cues. In the second language, both groups used syntactic cues the same amount and that amount showed slightly more reliance on syntactic cues by good L1 readers and quite a bit less reliance by poor L1 readers. With regard to the use of semantic cues in the L2, the good and poor L1 readers became much more alike again with poor readers using slightly fewer and good readers using considerably fewer.
Other researchers have looked at good and poor readers' strategies in a different light. Moyle (1968), Weber (1970), Southgate-Booth and Arnold (1975), Neville and Pugh (1975), and Potter (1982) have all suggested that the differences between good and poor readers lies in the fact that good readers make better use of succeeding context. Weber's study used miscue analysis and showed that good readers were more likely to return and correct initial incorrect readings in light of succeeding context. Neville and Pugh gave readers two versions of a reading comprehension test. The first was a normal cloze test and the second was a modified cloze test with all of the succeeding context removed. The researchers' prediction that better readers would show a greater drop in scores because of missing succeeding context proved true. Potter (1982) argued that the drop in scores could not be attributed to a greater reliance solely on succeeding context. He suggested that the Neville and Pugh results might be due simply to the fact that better readers might have greater knowledge of subject matter which more context allows them to pull in. Potter suggests that the same drop would have occurred if the preceding context were removed. Potter says,

The poor reader who was unable to produce the correct response in the normal cloze test because of his inadequate knowledge would not be affected by the removal of the succeeding context, whereas the good reader who was able to would be affected.
Potter also suggests that the Neville and Pugh work was partially invalidated by the use of scores on the normal cloze test to divide the readers into good and poor readers. In his experiment, Potter used a standardized reading test to divide his subjects and two version of a cloze test using items where the same information was deleted either as preceding or succeeding context. His results showed that the good readers were almost twice as likely as the poor readers to make use of the succeeding context.

Other researchers have suggested still other differences between good and poor readers. One of the theories of most current interest is with schemata theory. With regard to L1 reading, Anderson, Reynolds, Schallert, and Doetz (1977) have proposed that less efficient readers may be different from better readers in any of three possible ways: 1) not having the background knowledge (schemata) needed to comprehend the passages; 2) having the background knowledge or schemata but not knowing how to use it in understanding a passage; or 3) not knowing how to change an original schemata being used if something in the passage shows that schemata to be illogical or inappropriate.

Anderson et al. say the reader goes through a process of matching details from the reading material to some internal idea of what the reading is about. If the details don't match, the reader may change his internal idea or the internal idea may be so strong that the information from the page which would contradict it may be overlooked.
Hudson (1982) explored whether helping L2 readers produce schemata would override the greater problems with the second language which inhibited their reading. He used three methods to induce schemata: pictures with questions and their writing of a prediction about what the passage would contain; standard study of vocabulary which appeared in the passage; and silent reading, a comprehension test, and then re-reading. Hudson's results suggested that advanced level L2 readers bring more background information to bear on the reading process than lower level readers. The advanced readers also seemed more capable of altering the schemata they were using in light of information received after the schemata was first induced. This study essentially looked at the predictions of the entire meaning of a passage rather than the prediction of separate phrases or words as is often studied, but the prediction of these larger units of meaning still fits Goodman's psycholinguistic model. The findings also lend support to the idea that the use of succeeding context may be one of the major differences between good and poor readers.

**Research Design and Methodology**

Two studies were undertaken to help answer the research questions posed. They involved the division of both native English readers and ESL readers into good and poor groups by use of a standardized reading test. The readers then took one of two guessing tests, one involving missing succeeding
context and one involving missing preceding context. The data were analyzed to see 1) if Joodman's theory about reading in a first language can be applied to reading in a second language; 2) if guessing skill really does relate to reading skill in both first and second language; and 3) if the reading strategies of good readers in both first and second language are the same. The answer to the first question is contained in the answer to the second and third questions.

The subjects used in the studies to answer the research questions consisted of 65 native English speakers and 55 ESL speakers. The first guessing study had 39 native English speakers and the second study had 26. The first study had 31 ESL speakers and the second study had 24. The native speakers were all students in regular university reading classes at Brigham Young University. The non-native speakers were enrolled in intensive ESL reading classes either at the Utah Technical College in Orem, Utah, or the English Language Center connected with BYU. The ESL group consisted of 20 Latins, 16 Japanese, 5 Vietnamese, 2 Chinese, and 2 Filipinos.

**Research Design to Answer Question 2**

In order to answer the second question of whether good readers were good guessers, the subjects in both the native English and the ESL groups were divided into good and poor readers according to their scores on the Nelson-Denny
Reading Test, Form B. This test is a standardized reading test consisting of a 10 minute/100 item vocabulary test and a 20 minute/30 item comprehension test. This test was chosen because it has been standardized and shown to accurately measure reading achievement (See Buros, 1976; Carney and Geis, 1981; and Geis and Carney, 1979) and because it did not make use of the cloze procedure about which Potter had complained. For each study the mean score of the subjects on the Nelson-Denny Test was figured for the native English speakers and all readers in that native English group scoring above that mean (Study 1 $\bar{x}=64.04$; Study 2 $\bar{x}=72.27$) were included in the study as good readers. All scoring below that mean were considered poor readers. The mean for the ESL readers (Study 1 $\bar{x}=36.13$; Study 2 $\bar{x}=29.88$) was also calculated and the subjects in that group were divided in the same manner into groups of good and poor readers.

The guessing test consisted of a 101-word reading passage taken from a 9th grade social studies textbook. According to the Dale-Chall readability formula, the passage was at an 8.9 grade level. This was below the average reading level of the combined groups as shown by the Nelson-Denny test. The content of the passage was general and appeared not to be culturally biased. (See Appendix A for the complete passage.) At no time other than after the last guess were students able to see the passage in its entirety. In the
studies, subjects were told that their task was to guess each of the 101 words of the passage. At the beginning of the task, subjects were told that the passage was taken from a social studies text and, after the subjects made each guess, they were shown the correct word which would fill the slot. In the first study, subjects began at the beginning of the passage and were guided in their guesses by the preceding context. In the second study, subjects began at the end of the passage and were guided in their guesses by the succeeding context.

The guessing test was scored by classifying the guesses students made into one of four categories: if the guess was exactly correct--3 points; if the guess was not the precise word but was a semantic possibility--1 point; if the guess was not the exact word but was syntactically possible--1 point; if no guess was attempted or if the guess fell in other than the mentioned categories--0 points. To illustrate the scoring process, we will look at the slot numbered 76 in Study 1 and 26 in Study 2. In Study 2, the subjects would have seen "_____ raised for food." If a student guessed A&E, he would be credited with 3 points for the exact answer. If IS were guessed, or any word which syntactically would fill that auxiliary verb slot, he would be credited 1 point. And if the student guessed a noun like CHICKENS (the subject of the passage) or an adverb like COMMERCIALLY, both of which semantically make sense in the
given context, he would receive 1 point. But if COUNTRY (A word related to previously given context but inappropriate to this slot) was guessed, the student would have received 0 points for the slot.

The subjects' scores on the guessing test were calculated and then those scores were correlated with their scores on the Nelson-Denny Reading Test using a Pearson product-moment correlation. It was assumed that if a significant positive correlation was found, that the answer to the question about whether good readers were good guessers would be yes.

**Answer to Question 2**

In Study 1, the Pearson product-moment correlation coefficient was .76 for the combined group of English and ESL readers. In Study 2, the coefficient was .77 for the combined groups. Both of these coefficients are significant at the .001 level (Study 1 df=66; Study 2 df=48). This suggests that good readers are indeed good guessers and poor readers are in fact poor guessers. The answer to research question 2 is yes.

**Answer to Question 3**

To answer the question about whether the reading strategies of good readers were the same in both languages, we looked at the partially correct guesses to see what proportion of them were syntactically correct (indicating a reliance on syntactic cues) and what proportion of them were semantically correct (indicating a reliance on semantic
cues). This part of the study was only performed on the data from Study 2.

In Study 2 where the subjects were making their guesses based on succeeding context, good L1 readers had 601 partially correct guesses with 381 (47.6%) being syntactically correct and 420 (52.4%) being semantically correct. Good L2 readers had 713 partially correct guesses with 341 (47.6%) being syntactically correct and 372 (52.2%) being semantically correct.

On the other hand in Study 2, the poor L1 readers had 932 partially correct guesses with 421 (45%) being syntactically correct and 511 (55%) being semantically correct. The poor L2 readers had 647 partially correct guesses with 294 (45.4%) being syntactically correct and 353 (54.6%) being semantically correct.

These statistics suggest that the strategies of good readers either in a first or a second language appear to be the same as far as being governed by syntax or semantics. Although the difference in the use of semantics and syntax is probably not significant for the population of the second study, the fact that the poor readers seemed to rely more heavily on semantic cues contradicts the studies cited previously (e.g., Cziko, 197d; Clarke, 1980).

In order to show which words seemed to be difficult or easy for the students to guess and, thus, to show whether there might be more advantage to students who did use either
the preceding or the succeeding context, a score was calculated for each slot using the total number of points earned by all subjects in each group for the slot. This total was then divided by the total number of points possible if each subject in the group got full credit. The result of these calculations yielded a percentage of correct guesses per slot. The slots were then grouped into one of eleven syntactic categories--infinitives, pronouns, auxiliary verbs, conjunctions, verbs, past participles, articles, nouns, prepositions, adjectives, and relative pronouns--and group totals for each category were figured. The group totals for each category from Study 1 (when the preceding context was used) were then compared by means of t-tests with the group totals for the same categories from Study 2 (when the succeeding context was used). It was assumed that any significant difference for any particular category would show the advantage that might accrue to a reader who only used one or the other kinds of context and might indirectly show a reading strategy that good readers could take advantage of. (It is important to note at this point that these studies were not set up in such a way as to be able to tell definitely if good readers actually do use the strategies of looking more at one context than another. These studies would only show whether there might be an advantage in doing so.)
The group totals and the observed t's for the various syntactic categories are given in Table 1 to Table 3.

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</table>

These tables show that some slots are easier to guess with a succeeding context than with a preceding context and
that some slots are easier to guess with just the opposite. For example, slots requiring adjectives were easier for readers from all subgroups to guess with following context than with preceding context. Not surprisingly, it seems easier overall for both ESL and native English readers to guess these prenominal slots using the post-slot context. It is the noun that governs these prenominal slots and having the noun makes the guessing of the words preceding it easier.

On the other hand, and also not surprising, is the fact that the infinitive verb seems easier to guess with preceding context. Here it is the infinitive marker "to" which signals that the infinitive verb (the simple form of the verb) is coming. Relative pronouns were difficult for all subjects in both studies as evidenced by the low scores of the groups on these slots.

Our answer to the third research question is still vague at this point. Although ESL and native English readers seem to make the same kinds of guesses as far as syntax and semantics go, the results of this research bring into question the idea that the use of one of these types of cues is more an activity of good readers than poor readers. Our readers seemed to use them both although the poor readers used them less effectively. Also, the differential scores for particular kinds of slots which this study reports cannot be taken as absolute proof that the use of either preceding or suc-
ceeding context is making a difference in reading ability. The findings of the studies do point in that direction however.

What does all this mean for the idea of reading theory and reading in a second language? The answer to this question is also a little uncertain. It appears that instruction in the use of all cues, syntactic or semantic would help, but there is no clear finding that can be said to favor one kind of instruction over another.

The case for teaching readers to use all of the context is strong in our results showing that some words are guessed much better from the succeeding context than from the preceding. If nothing else, it should be very clear that readers should be instructed to go on reading rather than stopping when they reach an unfamiliar vocabulary item. In light of these findings, cloze test developers should also be very clear in the instructions they give about how to perform a cloze test and/or very careful in selecting words to delete that can be guessed equally from the preceding and succeeding context unless the test developers specifically want to test whether a reader is using the succeeding context. Then items which can be guessed more easily on the basis of the succeeding context should purposely be deleted.

Overall, we feel that reader strategies can be discovered and that this is one area of psycholinguistic research deserving much further study.
REFERENCES


Student affective responses to language tests have only recently been formally investigated. These studies have drawn heavily on the extensive test anxiety literature of psychologists, who during the past two decades have produced several hundred articles illuminating the constructs of anxiety as well as causes and solutions. As varied as these studies have been, nearly all have employed classical empirical research with its hypothesis-testing orientation and quantitative characteristics. The present studies seek to extend and complement earlier findings by utilizing a qualitative research approach, with an emphasis on retrospection.

An important construct in the area of exam affect is the degree of permanence in the emotive response that subjects experience—namely trait and state anxiety. Trait anxiety consists of one's general inclination towards anxiousness while under stress, notably stress from any kind of test. Trait anxiety, on the other hand, is task specific; it varies with the specific testing situation at hand (Spielberger 1966, Wildemuth 1977). The former has been extensively investigated and profiles created of high anxiety (HA) and low anxiety (LA) subjects. For example, LA individuals consistently score better on many different measures than HA persons do (Holmes 1972, Rosenzweig 1974). And females tend to be more anxiety prone than males do (Tryon and others 1973, Morris and others 1976).

But state anxiety has certainly not been ignored. Studies include the impact of retesting (Cohen 1971), feedback on test performance (Prestwood and Weiss 1978), unannounced exams (Warner and Kauffman 1972), and others.

Another construct formulated by psychologists is the debilitating-facilitating distinction in emotive affect. By its very nature, anxiety had been assumed to be debilitating to test takers. But almost a quarter of a century ago, a distinction was made between stress that was helpful or "facilitating" and that which was "debilitating" (Alpert and Haber 1960). Since then, various studies have improved our understanding of the facilitating-debilitating construct by applying it to matters such as academic performance (Gaudry and Spielberger 1971, Scovel 1978).

In the area of second-language test-"impact" studies, the focus has been largely on state anxiety: Anecdotal reports have provided insights on student reaction to test form (Savignon 1972, Mullen 1979) and even on the
language of distractors (Groot 1976). While at least one formal study looked at the effect of NL distractors (Maluf 1979), much more attention has been given to the impact of various question types (Stevenson 1979, Jones and others 1980, Shohamy 1980, Madsen and others 1984).\(^1\) Moderator variables have included proficiency level, ability or aptitude, sex, language background, credit versus noncredit coursework, the language subskill being evaluated, and practice effect.

Second-language, state-anxiety investigations, then, have tended to pursue the initial concern over the impact of certain test forms—quantifying the stress triggered by each type of question and evaluating this stress in relation to variables selected by the experimenter. As useful as the insights from such studies has been, it now appears that those of us investigating test affect have shackled ourselves by utilizing a single research paradigm involving only quantitative, empirical investigation.

In other areas such as second-language acquisition and language teaching, scholars have been more creative. Here, researchers have utilized qualitative procedures including the ethnographic techniques of anthropologists (Ochsner 1979, Long 1980) so that processes and interaction can be observed (Larsen-Freeman 1981, Gaies 1983, Allwright 1983), participant observation recorded (Schumann and Schumann 1977, Bailey 1980), and even mentalistic language-processing strategies investigated, through introspection and retrospection (Cohen and Hosenfeld 1981, Radford 1974). Such investigations are often hypothesis generating, relying on insights derived from the learner rather than suppositions posed by the researcher.

These features of qualitative research seemed ideal for complementing and extending the test affect studies conducted to date. While introspection has been used successfully in medias res (Zamel 1983), it was not feasible, of course, to interact with students during an actual examination. Retrospection, then, was the more logical research strategy, since investigators would not need to disrupt the testing situation.

Among the interview procedures available, the general interview guide approach appeared most useful for collecting retrospective information that could be compared across subjects (Patton 1980:198-206). The check-list used with

\(^1\)State anxiety findings such as sex differences and national differences in anxiety ratings (Scott and Madsen 1983) have tended to be of only secondary interest. There has been only one ESL/FL study touching on the facilitating-debilitating construct issue (see Madsen 1982).
this procedure allows for spontaneity, flexibility and conversational interaction but helps assure comprehensive and systematic data collection.

Study One

One purpose of the initial study was to evaluate the midterm tests in two college ESL classes. A second was to explore student reactions to such tests by utilizing personal interviews to generate retrospective data. While still interested in the impact of various question types, we saw a need to learn what additional factors give concern to test takers.

Subjects. This initial study involved nine students enrolled in Advanced ESL Methodology, a graduate TESL course; seven of these students were concurrently enrolled in the ESL Testing course. Both classes were taught by the first author. Of these six women and three men (all in their twenties), four were native Japanese speakers, and five native English speakers—one from Canada and the remaining four from the United States; one of these four had a FL-speaking parent and a native English speaking parent.

Procedure. To help evaluate student reactions to their exams, a standardized anxiety inventory was administered to each student—the Alpert-Haber Achievement Anxiety Test. The AAT includes ten items that measure debilitating anxiety (such as "Nervousness while taking an exam or test hinders me from doing well"), nine items that measure facilitating anxiety (for example, "I work most effectively under pressure as when the task is very important"), plus neutral items; all three types are scrambled. Responses are marked on a five-point Likert-type scale, ranging from "almost never" to "almost always." Results indicate the amount of trait anxiety characterizing each student.

After taking each of the two midterms, students completed a state anxiety questionnaire related to each of the five subtests, which involved different question types ranging from multiple-choice to short-paragraph items. For each test form they responded on a five-point Likert-type scale (ranging from "strongly agree" to "strongly disagree") to the following statements: (1) I liked the test, (2) This test was difficult, (3) I felt pleasant (happy, calm) during this test. These are adaptations of the items that factor analysis had shown to be highly emotive on the Jones-Madsen Affect Questionnaire (Jones and others 1980).

Finally, an informal, exploratory interview was conducted with each student, following Patton's "general interview guide approach." Ranging from twenty to forty-five minutes,
the interviews averaged 30 minutes apiece. Students were informed of the purpose of the interview and invited to comment on any test-related matters that came to mind. (Since answers to specific questions had been discussed in class, interview sessions were not devoted to this.) The initial couple of interviews were very extensive, in order to discover the broadest possible range of student concerns. Extensive notes were taken during the interview, but no taping was done. Key items were then referred to in subsequent interviews, for purposes of comparison. But every effort was made to keep the discussions informal and openended.

Findings and discussion. The median test anxiety score for the nine students was 30 (the mean, 30.8). All four of the students below the median (scores ranging from 17 to 23) had two English-speaking parents. Three of the four higher-anxiety students (scores ranging from 39 to 47) had one or two FL-speaking parents. As might be anticipated, native English speakers evidenced less test anxiety than foreign students did.

Foreign students felt they could perform more successfully on objective items than on completion and essay questions. But the least-anxiety-prone Japanese student said she preferred questions requiring writing because of the "flexibility" permitted, even though she tended to do better on multiple-choice items. Some NL English speakers expressed little preference for any specific exam type, approving of a variety of test forms. But one of these people noted that her humanities background enabled her to perform reasonably well on essay-type it class.

The state-anxiety questionnaire ratings indicate that the short paragraph response item was the most stressful format. On an absolute scale, this was the only measure that registered in the + Anxiety range (above 9.0) on both midterms.

The interviews were very helpful in interpreting these findings: As we have seen, FL students tended to be insecure when expressing themselves in writing. And other factors emerged. More than one student indicated why the paragraph items, which concluded each test, were so stressful: They simply "covered more difficult material." The highest scoring student indicated she was more comfortable with the multiple-choice items than with the paragraph questions simply because she knew the content of that section better.

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2 The lowest possible test anxiety score would be 10; the highest possible score would be 50. The higher the score the greater the amount of anxiety experienced in taking tests. Scores in this pilot study group ranged from 17 to 47.
Some indicated a need for the professor to clarify the instructions for paragraph items. For example, a low-anxiety student who expressed no difficulty with any of the question types said he was troubled with this section because he was not clear on either the length of response required or the specificity expected. A Japanese girl indicated she was not accustomed to this format. Probably the only direct criticism of the paragraph items by a native English speaker came from a high-anxiety student who said they were too time consuming: "A person could go on and on" in answering them. In short, student reactions varied considerably, and most of the objections to the anxiety-producing paragraph items were related to matters other than their form.

Besides investigating the impact of test form, the pilot study also sought to determine whether or not the academic subject being tested made a difference in the anxiety experienced by students. Seven students concurrently enrolled in both classes were evaluated. The form of the two examinations was essentially the same, and both classes were taught by the same teacher. Unfortunately, it was not practical to have half of the students take the testing midterm first and half the methodology midterm first. Results from the state-anxiety questionnaire, reflect little difference in overall preference. But during the interviews, six of the seven persons enrolled in the two classes indicated that the testing exam was decidedly more anxiety producing.

Students indicated more than one reason for the reduced stress experienced on the methods exam. Five persons explained that the experience of taking the first test, plus the feedback received when the test was discussed in class, significantly helped them in taking the second exam. There was broad agreement on the value of practice effect as far as test format is concerned. During the interviews, five students also indicated that the content of the second exam was more familiar and less threatening. Two individuals felt there was less material to be accountable for on the second test. Another admitted that she was more nervous on the first test simply because she hadn't taken the time to prepare for it adequately.

In addition to commenting on test form and anxiety associated with a specific subject matter test, interviewees reflected on other matters, such as the effect of the unusual length of the tests. All four of the HA students indicated that exam length was stressful, while LA students had little to say about length. Students also commented on exam "hangups." High test anxiety students tended to focus on difficulties associated with cramming. Only two students said they were free of exam hangups, and these were LA students.
Interviewees indicated, as well, their times of greatest stress when taking the midterms. Six of the nine subjects said they experienced greatest stress at the beginning of the exams. Two LA students experienced more stress midway through the test than at the beginning. And four mentioned some anxiety at or near the end of the test; but the reasons for this are illuminating: One said she was late in picking up her husband from work; another said it was the difficult paragraph section that troubled him; a third said the last part of any test was stressful when it was timed; and a fourth person said she experienced anxiety at the conclusion when she began to wonder if she had responded correctly throughout the test. But generally, the greatest stress on the exams occurred initially.

Interview sessions also dealt with factors that contributed to the reduction of anxiety. All referred to the special handouts which gave the format and content of each section of the test as well as sample items and the points for each section. Eight of the nine approved of the handout. However, the four HA persons found this more useful than did the LA students. The anxiety-prone likewise expressed great appreciation for removal of time constraints, whereas only one LA person commented on this. And HA people were also unanimous in favoring the exam's being administered at the university testing center instead of in the regular classroom, with just one LA student advocating this arrangement. A typical HA interviewee who strongly favored the anonymity of the Testing Center said of the classroom setting: "When you're surrounded by competitors, you see when they turn each page--how fast they work--and this makes you nervous."

Departing from the test affect issue, examinees described test-taking strategies. Interestingly, four out of the five HA people indicated that they surveyed the test before answering any questions. Only one of the low-anxiety group included this as a test-taking strategy. Seven of the nine students in the study said they worked straight through the exams with no skipping about to answer easier questions; the other two failed to comment on their strategy. Two persons mentioned the tagging of questions needing further attention.

Only a few discussed strategies used in preparing for exams. The highest scoring student preferred individual study. The two mentioning a preference for group study were both anxiety-prone students.

Finally, students suggested ways in which the midterm tests could be improved. These included clearer instructions for the sentence response and paragraph items, shifting of objective items to the end of the exam, reducing the
number of paragraph questions, and providing more space for responses.

Study Two

A follow-up study was conducted to compare responses from non-university overseas students enrolled in ESL skills classes with those in Study One where university students were enrolled in graduate-level content courses. In addition, the number of subjects was increased.

Subjects. Seventeen ESL students were randomly selected at the BYU English Language Center: 6 males and 11 females. They included 8 Spanish speakers, 2 Japanese, 2 Koreans, 1 Chinese, 1 Dane, and 1 Portuguese; and they ranged from near beginning to advanced (over 500 on the TOEFL).

Procedure. Students were administered the five-part BYU ELC Placement Battery. This included a guided oral interview, a multiple-choice grammar section, reading comprehension, dictation, and multiple-choice listening section.

To assess trait anxiety, subjects were administered the Albert-Haber Achievement Anxiety Test (AAT), which had been translated into Spanish and Japanese. Those who didn't speak either of these languages took the test in English, with teacher assistance.

The state anxiety questionnaire on reactions to test types was not repeated in this study, since introspective data on state anxiety had proved so fruitful in the previous investigation.

Taped oral interviews (supplemented with written notes) were conducted within twenty-four hours of the placement battery. Neither the students nor the interviewer was aware of examination results or placement levels at the time of the interviews. Again the general interview guide approach was used, and again only one interviewer was present. The sessions were planned for twenty minutes each, but extra time was allowed for students who desired to continue longer than this.

Findings and discussion

3To familiarize herself with the interview guide approach, the second author conducted at the BYU English Language Center a preliminary study of 24 ESL students, who responded to questions on their midterm exam. Like Stevenson (1979), she found little anxiety on this diagnostic progress test since it didn't affect level placement or promotion.
Test results. AAT scores on these subjects divided them into three groups--five in the HA range (with scores from 30 to 38), four in the LA range (scores from 13 to 19), and the remaining eight students in the middle groups (scores from 22 to 28). Results from the placement battery identified eight students as beginners (levels 1 and 2), one student as intermediate (level 3), and eight students as advanced (levels 4 and 5).

Of the five HA subjects, two were beginners; one was intermediate; and two were advanced. And of the four LA subjects, two were beginners and two were advanced. There was also an even split between high and low proficiency students at the "neutral" or mid-anxiety range, with an even distribution by sex. HA subjects included two males and three females; they were from four different language backgrounds. The LA students included one male and three females—all Latins (three being Spanish speakers and one a Portuguese speaker).

Interview findings. Of interest was the fact that while listening was one of the two most difficult subtests for these students, it was perceived as being one of the two easiest. And even though HA subjects outscored LA subjects on every section of the battery, LA students were unanimous in rating the listening, speaking, and grammar subtests as 'easy,' while HA students tended to view them as rather difficult. Overall, the seventeen subjects ranked the grammar test as easiest, followed by the listening and the speaking tests. The writing test was viewed as next to the most challenging, with the reading test seen as most difficult.

As in Study One, the interviews were helpful in explaining the reasons for the stress experienced on the test battery.

Like the graduate students in the first study, there was a tendency for HA subjects to be concerned about the amount of time allocated for the exam. The three with the highest anxiety ratings each indicated the need for more time. For example, the most anxiety prone student said he felt particularly disadvantaged on the reading test since he was a slow reader. The three with the lowest anxiety ratings, on the other hand, indicated they had sufficient time for the test battery. And the least anxiety prone of all observed that being pressed for time was desirable since it helped one cope with other timed tasks. (One HA subject added that reminders of time remaining were stressful to her; but others—in the mid-anxiety and LA ranges—favored being notified of the time remaining.)

Another parallel with the first study was student reaction to exam length. Four out of the five HA subjects indicated the battery was too long. It was suggested that the test
be spread over two days so they could concentrate more effectively. By contrast with these reactions, not one of the LA subjects criticized the length of the test.

Since ESL affect studies have focussed so frequently on the relationship between test form and test anxiety, Study Two probed the reasons for negative reactions to differing test types. As in Study One, student reactions seemed often to stem from factors beyond the form of the test. More than one who had reacted negatively to the grammar test explained that the reason for this was their being pressed for time while taking it. Another said she didn't like the oral interview because she had expected a paper and pencil test and didn't know she was to be interviewed; this seemed to disorient her, making her "confused and afraid." Three subjects said the listening test caused them anxiety because the quality of the tape was unclear in places; and two others expressed frustration because of a numbering miscue on the test.

As in the previous study, personal factors entered in. One male student complained of jet lag that he felt affected his performance on the final two subtests. Another student claimed that the overly efficient central heating caused her discomfort while taking the test. And two others felt their performance would have been improved if they had been paced better with additional cues on the remaining time available.

However, one concern these pre-college ESL students expressed that the graduates in Study One did not was anxiety resulting from unfamiliar tests. Again, it was HA subjects that voiced the concern; LA people expressed no such reaction. In fact, one LA student commented positively on the unfamiliar listening test, saying she hadn't understood the items at first but comprehended them better and better as that subtest progressed.

Because of interesting comments in the first study on strategies used in preparing for the exam, this matter was raised as well in the second study. But only one of the seventeen subjects (a HA student) indicated any serious preparation for the exam. There appeared to be a general feeling that it was fruitless or unnecessary to make intensive, final preparation for a skills test such as this.

An unexpected bonus in both studies was the gratitude expressed by students for what they saw as a rare opportunity to interact extensively with teachers on their exams.

Conclusions
Utilization of qualitative procedures in assessing test impact in two instructional programs has served to complement and extend the findings from classical empirical research.

Results relating to the influence of test form suggest that earlier interpretations may be somewhat simplistic and that other factors such as question difficulty, clarity of instructions, and time constraints may equal or exceed the importance of form. And while students might specify one subject (such as the testing class) or subskill (such as writing) as being more anxiety producing than another, other factors such as practice effect and unfamiliar test item types were seen by examinees as the real contributors to lessened or heightened test anxiety. Moreover, additional information on trait anxiety was gathered. Again it was demonstrated that those tending to be anxiety prone have a unique profile in terms of their reactions to exams and exam conditions. Hypotheses generated by this research include the following: Might relaxed time constraints for anxiety-prone students result in improved measurement of their proficiency? Might shorter examination batteries result in improved measurement of the anxiety prone? Might a more careful pre-examination orientation improve the performance and reduce the anxiety of these same students? Is group study more effective than individual study for anxiety-prone students?

Finally, it would seem that systematic interaction between teachers and students on test evaluation and test affect have the potential not only for improving rapport in the classroom but also for improving evaluation, particularly of students who are most susceptible to test anxiety.
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No Penalty for Guessing: TOEFL Preparation with Microcomputers

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1. TOEFL

The chief advantages of Computer-Assisted Instruction (CAI) are widely thought to be: branching to allow personalized (and learner-controlled) practice; variety in presentation; constant reinforcement; and ease of record-keeping. To these can be added the facility for the assembly of raw data for research at a later date.

These advantages have led to the application of CAI to preparation for standardized tests on a large scale. Second only to the SAT in numbers of examinees per year, the Test of English as a Foreign Language (TOEFL) is becoming one of the largest "draws" to commercial test preparation centers in the U.S. and abroad, and foreign students already in the U.S. are demanding TOEFL preparation courses at their intensive English language programs. Preparation courses available for the TOEFL vary widely in format and effectiveness, and in addition many books of home-study material are published. Many of these courses are being adapted for use on microcomputers, and in addition some material is being written especially for microcomputer use. The major outlet for this material is for classroom use in intensive English language programs and commercial test preparation establishments.

The seven parts of TOEFL differ in format, and different skills are required (to different extents) for each. Section I (Listening Comprehension) is divided into three parts: sentence restatement, short conversations, and longer "episodes of communication" such as short talks or lectures, news broadcasts, or conversations. Part A requires the student to match the spoken statement with the closest paraphrase out of four sentences printed in the test book. Part B requires the student to choose the best answer out of four to a question spoken after the conversation. Part C is similar, but with anything from two to six questions per episode. Part A has 20 items, and Parts B and C 15. (See TOEFL Test and Score Manual, Educational Testing Service, Princeton, N.J. (1981) for a more detailed discussion.)

Section II, Structure and Written Expression, "measures mastery of important structural and grammatical points in standard
written English" (ibid. p.7). In Part A the examinee chooses the best out of four words or phrases to complete a sentence, according to his knowledge of standard written English (15 items), and in Part B he must identify which one out of four underlined words or phrases in a sentence would not be accepted in standard written English (25 items).

Section III, Vocabulary and Reading Comprehension, "measures the ability to understand the meanings and uses of words as well as the ability to understand a variety of reading materials." Part A (Vocabulary) asks the examinee to substitute one of four words or phrases for a word or phrase in a sentence so as to preserve the original meaning. Part B (Reading Comprehension) is based on a succession of short reading passages followed by from one to seven questions. The examinee must choose the best answer out of four, based either on the main or secondary ideas of the passage, inferences or analogies from the passage, or meanings of isolated words or phrases in the passage. Occasionally there are "sentence restatement" questions where the examinee must choose the sentence that most nearly conveys the meaning of the original. Part A and Part B both have 30 items.

It will be noted that there is a similarity of format throughout in terms of the mechanics of answering the questions (to simplify machine scoring), and that there are no questions which might require anything other than a multiple-choice format (to ensure objectivity). This makes TOEFL an ideal test to prepare people for by microcomputer.

2. Section II

Leaving aside questions of "testwiseness" which usually feature more or less prominently in test preparation programs, let us look at the methods which might be used to prepare people for each sub-test of TOEFL. Listening Comprehension presents many more difficulties than the rest of the test, on account of the interaction that would be required between the microcomputer, the student, and a tape recorder or some similar device in order for the student to hear each statement or question at the appropriate time. Perhaps the most expeditious solution in the short run is for the student to have a cassette player beside him which he simply switches on and off.

In each section the most effective form of organization would, I believe, consist of three modes: Tutorial (or explanation); Practice under non-timed conditions with access to explanation either of the rule as outlined in the Tutorial mode or of the reason for the student's choice being wrong (more of this later); and Test (timed conditions, no access to explanation, obligatory completion of a set number of items).
The Tutorial mode is composed of a succession of frames with the Purpose and Scope of the Unit:

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STRUCTURE UNIT 5

The purpose of this unit is to help you to be able to recognize a passive construction and to select the proper passive form of the verb phrase.

There are two types of problems, involving agentive and agentless passives:

1. Cue types in which the SUBJECT + BE must be selected, but the past participle is part of the cue sentence.

2. Cue types in which only the PASSIVE VERB PHRASE must be selected.

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EXAMPLE 1

___ founded in Philadelphia.

(A) The American Philosophical Society, which was
(B) It was the American Philosophical Society
(C) Which is the American Philosophical Society
(D) The American Philosophical Society was

ANSWER: ___

===============================================

(D) IS THE CORRECT ANSWER.

(A): passive verb phrase now part of a subordinate clause; incomplete sentence.
(B): ungrammatical.
(C): ungrammatical.

===============================================

The Practice mode and Test mode both randomly select items from an item pool of anything up to forty or fifty items, depending on
the estimated importance of the item type to the section. The student could be allowed to select the number of items to be attempted in the Practice mode, but preferably the number of items in the Test mode should be standardized.

14. The periods when lemmings swarm _____ by naturalists.
   (A) recorded
   (B) have been recorded
   (C) being recorded
   (D) which have been recorded
   ANSWER: __

(D) The periods ... which have been recorded by naturalists.

==INCOMPLETE SENTENCE==
==TRY AGAIN==

(B) The periods ... have been recorded by naturalists.

== *~* CORRECT *~* ==

3. Section III

The Vocabulary subtest requires a different approach. The Tutorial mode would consist of various lessons in background (affixes, phrasal verbs, compounding, etc.) followed by some choosing of synonyms. The Practice mode would be in test format, with selection of a wrong answer followed by the appearance of a sentence using the distractor in context.

The Reading subtest Tutorial mode would mention such question types as: title questions, topic questions, purpose-of-the-passage questions, etc. The Practice and Test modes would
have to be a little more complicated in order to allow the student to re-read the passage if he so chose. I would like to see this section include the capability to choose: (A) Answer the question; (B) Review the passage; (C) Continue to the next question (and return to that question later). The sentence restatement question type is easier to deal with.

4. General Comments

(1) The information contained in the Tutorials must be relevant to skills actually tested on TOEFL. Many "TOEFL Preparation" courses make the mistake of simply reviewing all ESL grammar etc. in the belief that "it can't do any harm." The content of the course should be based on item types regularly tested on TOEFL.

(2) Sound content material should be written before a start is made on formatting and programming. 1

(3) The ideal TOEFL preparation system would serve a diagnostic function also: after the student took a pre-test, his weak areas could be pointed out by error analysis.

(4) The student should have the greatest possible control over his learning situation, within constraints of making the test simulation as realistic as possible. The system would be menu-driven, preferably with a score-keeping system on separate disks.

(5) I would be most interested to hear of any authoring system which could be adapted or produced to enable work on this type of project to move ahead expeditiously. Your comments are helpful and welcomed.

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1. Ms. Carol B. Eisenmann, University of Southern California, to whom I am indebted for this piece of advice and much other information contained in this paper, made this point in her presentation "Some Instructional Design Concerns in Software Development," to CALICO, Baltimore, MD, January, 1984.
15. Francis Preston Blair, Jr., _____ born in Kentucky, lived and practiced law in Missouri.

(A) was
(B) he was
(C) although
(D) who he was

======================================================================

(B) Francis Preston Blair, Jr., he was born ...

==ARE YOU SURE?==

======================================================================

==WRONG==

==THE CORRECT ANSWER WAS (C)==

======================================================================
The first zoological garden in the United States was established in Philadelphia in 1874.
57. Acetylene is potentially dangerous, especially when kept under pressure.

(A) Potentially explosive acetylene can be stored under pressure.
(B) Compressed acetylene is especially dangerous when it is kept for long periods of time.
(C) A person under stress is particularly susceptible to the harmful effects of acetylene.
(D) Particularly when it is kept under pressure, acetylene can be dangerous.

ANSWER: ____

======================================================================

==WRONG==

(A) Storing acetylene under pressure is a BAD idea (TURNABOUT)

==TRY AGAIN==

======================================================================

==WRONG==

(B) Time is not mentioned (NEW INFORMATION)

==TRY AGAIN==

======================================================================

==THE CORRECT ANSWER==

(D)
A TAXONOMY OF HUMAN COMMUNICATION

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Introduction

The purpose for this paper is to further clarify understanding of human communication. The main assertion if that all human communication may usefully be seen to belong to three and only three types: disclosure, directive, and description. The support offered is rational and intuitive. What is presented here is intended to be highly consistent within itself; it is also intended to be grounded in common sense with you as hearer as witness to that. The relevance intended is that by shedding light on the situation, the possibilities of human communication may be enhanced.

A Theory of Man

Fundamental to this discussion is the image of man presumed. It is here posited that man is a three-fold being, each part making possible a separate function. Man is a feeling, thinking and acting being. Though these are analyzed as three, it is important to see that they are integrated; one performs one function only in connection with the other two. Thus when one feels or desires, one also thinks and prepares for action. When one thinks, one also feels or desires and prepares for action. When one acts, one is also feeling and thinking.

It is the feeling aspect which is most distinctive about man. A gearchain reacts to its environment by receiving power, acting to increase or to decrease that power with a corresponding change in velocity. A computer reacts to its environment by receiving data then outputting transformed data; it may be said to think and to act, though that thinking is surely less than the human kind. A human being receives input from many feeling sources, then creates a desire which is not simply a function of that input. A human being receives data about the world from many sources, then combines these to create a special personal construct of the universe. Feeling and thinking then combine to produce action. Feeling provides the what of action, thinking provides the how of action, and action delivers what feelings desire and the mind conceives.

Man is here considered to be free. He chooses his desires, his thoughts and his actions. His environment provides limits within which he functions, but what and how he acts within those limits is his choice. The purpose of receiving communication is to become aware of the possibilities for action and the limits of those possibilities. The purpose of sending communication is to act upon the universe to transform it into a place more compatible with one’s personal desires.

The challenge for every human being is to communicate with sufficient effectiveness and efficiency that one becomes satisfied with what he creates through his own communication. It seems that one can do this best when his feelings and thoughts correspond with the way the universe really is, and when his actions are an integrated and effective force to change the universe in the direction he thinks is better. Sometimes we desire, but our thoughts and actions cannot deliver what we desire. Sometimes we desire and then are repelled by that which we thought we desired. Human life is the attempt to create in ourselves an integrity of feeling, thought and action which accords with the reality of the universe and which enables us to create those satisfactions which we seek.

It may be said that a human being is under control when his thinking and acting are consistent with his feeling. The possibility of that consistency is the possibility of man’s freedom. Gaining that consistency is a skill learning which men gain only through much concerted effort in correct practice.

A Definition of Communication

Human communication is assumed to be dyadic; it may always be analyzed as the relationship between two and only two persons. Communication is here defined as the effect of A upon B. Human communication is the effect of person A upon any B, be it person, place or thing. Fully human communication is the effect person A has on person B. This communication may be isolated for a specific short time interval...
or it may be summed over an extended period of time. Normally communication is reciprocal: person A affects person B, then person B affects person A. Mass communication is the effect person A has on many persons B, but each case may be analyzed individually.

This definition allows both verbal and non-verbal forms of communication. No attempt is here made to catalog all of the possible ways in which one person may affect another, but there are two examples which are noteworthy. Person A may affect person B by not sending a message at time T. Person A may affect person B by not growing, not becoming more capable, thus not affecting person B in the manner that would have been possible had A changed as was possible.

This definition is seen to be the broadest possible definition of communication. Any not so inclusive could not be used to give a full account of the communication situation. The concepts of message and meaning are not used in it even they are important to most communication. They are elements which are projected by a speaker and constructed by a hearer, but which never are assuredly common to both speaker and hearer, as we shall see below.

A Model of the Human Communication Process

We assume for our model of human communication that we begin in medias res. We take person A as he exists in the world, having received much communication from other human beings, having decoded that with some success: having well-formed opinions about the persons who communicate with him and about the world and the universe, and having some fairly definite ideas as to just what changes he wishes to effect in the world.

Person A is seen to be doing three things more or less simultaneously and continuously. First, person A is translating the verbal messages of others. To do this he creates an hypothesis as to the intent of a given speaker, then fleshes out that hypothesis according to the verbal-cultural context which unites person A and the speaker which he is translating. This is a creative, willful act for which he is responsible. This translating or decoding is essentially but not exclusively a function of the thinking of person A. That is to say, this translating reflects what he believes the person he is translating to have said; but it does not necessarily reflect what he believes the person he is translating to have meant. True meaning comes in assessment.

Person A is also assessing the nature of the world around him. He assesses the persons whom he translates, and decides whether they are trustworthy or not, whether they speak ironically or not, etc. Thus he decides what they really mean by what they have said. He assesses the total social context, the verbal and physical messages he has received and is receiving from all persons. He assesses the physical environment as to what it was, is, and portends. All of this assessing is the creature of the imagination of person A. Though he works with abundant input, the output of his assessment is of his own making. This assessing is essentially but not exclusively a function of the feeling of person A. That is to say, it reflects his desires.

The third function which person A is continually doing is forming intents or intentions. Out of what he has translated others to have said, and out of his assessment of what they really meant and his assessment of the past, present and future of the state of the world, person A is preparing to act to affect the world, either by speaking or not speaking, or by acting physically or not acting physically. That intention reflects the desires of person A and his thinkings, but is essentially the action part of his nature. Once the intention is formed, the actions of person A begin to reflect his intent.

The translations, assessments and intents of person A are the thrust of his personality in the world. The manifestations of that thrusting are the actual actions of the person, their intentions reflected in speaking and acting. According to the best of his skill, person A translates his intentions into code or act. He may act honestly or deceitfully, selfishly or selflessly, but in any case his words and acts taken as a whole and over time reflect whatever his intentions are, be they honorable or dishonorable, skillful or artless. Speech code or action, all that person A does is relevant to a cultural context, and the translation he makes of his intent is projected into that context. The context has some physical existence, but its principal existence is in the minds of the hearers or observers of person A.

In addition to the cultural context, the speech code or action also exists in and acts in a physical
environment. Sign language in the dark or conversation by a waterfall are typical cases where communication or effect is lessened by the environment. The use of a megaphone or of video transmission are cases where the code and acts of person A are enhanced in their effect by the environment. The environment also provides referents which affect the interpretation of the code and/or act by the hearer, such as the presence of a charging bull when the cry goes out "Watch out for the bull!"

At this stage of communication, everything that remains is the responsibility of the hearer. The hearer must now perform his three functions. First he will translate any code into a message, using his understanding of the cultural context plus his personal knowledge of the speaker. Second he will assess the situation to decide what the speaker really meant, whether the speaker speaks truly or meaningful, and the net import of what the speaker literally says but really means in the context of the physical environment. Third, the hearer will create out of his translations, assessments and desires his own intentions, what he will say and/or do to try to push the world in the "right" direction. As with person A, person B is creative about each of these three steps. He creates a literal interpretation of person A's words and acts, he creates an assessment as to the true meaning and import, and he creates an intention to affect the world in some manner so it will become more to his liking, all done as a creative reaction to the universe.

Person B then encodes his intent, using the cultural context, and projects that code into the physical environment. Another person, perhaps person A, then decodes, assesses and forms another intention. Thus the process of communication is a constant reverberation of codes and acts among feeling, thinking, acting creative individuals.

The Taxonomy of Human Communication

Having laid the groundwork which was necessary, we may now proceed the make explicit the taxonomy of human communication which is the heart of this paper.

It is posited that all human communication may profitably be classified in one of three basic types. These types match the functions of man. Thus, representing the feeling aspect of man we shall designate a category to be known as "disclosure". Representing the thinking aspect of man we designate a category known as "description". Representing the acting aspect of man we designate a category known as "directive."

Disclosures may be subdivided into four main types, these types being more representative than exhaustive. First is the subtype of expression, such as "I feel ill." Second is the subtype of value judgments, such as "What a beautiful sunset." Third are plans, such as "I'm going to run for governor." Finally we have preferences, such as "I really prefer a little less winter in the climate."

Descriptions may also be placed in four subtypes, these here intended to be both representative and exhaustive. The first subtype is that of fact, which is a description or classification of a phenomenon which is present in the physical environment of the speech act describing it. An example of a factual type assertion would be "This dog has a broken leg." Second is the subtype of law; a law-like assertion is one which is an induction from many related factual assertions. For example, after observing many dogs with broken legs, one might assert that "Injuries of this sort are readily healed with proper care." The third subtype is that of theory, which is a wholly or partly fictional account created to make sense of the facts and laws of an area of thought. An example of such a useful fiction is Newton's idea of gravity. Gravity is never perceived, and it is quite possible that no such thing exists, but until we can do better it provides a useful mental image. The fourth subtype of descriptive assertion is that of principle. A principle is a fundamental postulate of thought which aids in the construction of theories and in the explanation of laws and facts. An example of a principle is Newton's idea that to every action there is an equal and opposite reaction.

Each kind of descriptive assertion may be used in the form of an hypothesis, which is an assertion of a fact, law, theory or principle which is seriously proposed for acceptance but which as yet lacks the necessary basis for acceptance. The basis for acceptance of a hypothetical fact is a pertinent observation. The basis for the acceptance of a hypothetical law is a series of observations of the phenomenon described by the proposed law, which series vindicates the statement as a reliable generalization. The basis for the acceptance of a hypothetical theory is its usefulness in forming a
Examples may also be divided into four subtypes. The first subtype is non-verbal, and will be called "art." This subtype includes all of those things which a human being may do physically to change the world around him. This area is subject to the laws of physics, wherein every effect must have a sufficient cause. Examples of this subtype are piano playing, carpentry, skydiving, sculpture and disguise. The next three subtypes are verbal forms, encompassing command, questions and definitions. In each of these verbal forms of directive the speaker is attempting to change the universe by using words only, leaving it to others to supply the force which physics requires for changes. In commands, person A tells person B what to do, how to move his muscles. In questions, person A is directing someone to make an appropriate response. In definitions, person A is directing how a certain symbol must or may be used. What all directive communications have in common is an attempt to change the nature of the world.

It is posited that every communication, verbal or non-verbal, may be formed into an assertion, which is a complete sentence expressing the hearer's hypothesis as to what the initiator of the communication intends. Where no assertion can be formed, the observer or hearer has no understanding, correct or incorrect, to attach to the observation. Thus every communication can be interpreted in the form of an assertion.

By examining cases we observe that all assertion may be properly categorized as being primarily disclosures, descriptions, or directives. But we further observe that every assertion may also be interpreted as representing the other two types as well as its primary type. In fact, it appears that a formulation of all three forms of the assertion is necessary to establish complete meaning. Thus "meaning" is taken to be a resonance among the three types of assertions wherein each is represented in different strengths according to the interpretation of the hearer. Just as intent involves feeling, thinking and acting, so interpretation involves attribution of feeling, thinking and acting as the hearer attempts to recreate the speaker's intent.

Examples are necessary at this point. If a speaker says "You're all right," after assessment we may form a disclosure assertion such as "I like you." But also meant will be a description, such as "I believe you are a reliable person." and a directive such as "You believe that I esteem you."

If the original code is such as "Utah is a western state," we have an assertion that is primarily a description. This may also be decoded and assessed as a disclosure: "I believe that Utah is a western state," and as a directive: "You believe that Utah is a western state." This resonance becomes more apparent when we move to the realm of theory. If the original code is "Man evolved from a lower form of life," the disclosure might be: "I am convinced that man evolved from a lower form of life," and the directive would be: "You believe also that man evolved from a lower form of life."

If the original code is such as "Stand up," we have a typical command form directive. But it also may be represented after assessment by the disclosure form: "I want you to stand up," and the descriptive form: "You are a person who should stand up."

Conclusions
1. Communication may be enhanced by understanding the resonance nature of meaning. 2. Assertions are better formed from assessments than from decodings, and that intent is more truly captured in assessments. 3. It is claimed that gods, little children and dogs understand principally by assessments, therefore interpret more effectively than those who do not recognize deceptive coding.