LANGUAGES AND LINGUISTICS
SYMPOSIUM

1978

November 18-19, 1977
March 30, 1978
Brigham Young University

Deseret Language and Linguistics Society
in cooperation with
the College of Humanities
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# Table of Contents

## November Symposium

### Morning Session

Lowell D. Bishop  
Some Implications for Teaching Cantonese to LTM Missionaries on the Basis of Cantonese Diglossia ............................ 1

Robert W. Blair  
Light from the Low Performance Language Learner ........................................ 9

Frank R. Otto and Janene Marrott  
The TICCIT-ESL Program at Brigham Young University ............. 18

Harold S. Madsen  
Measuring Listening Indirectly Through Monitor Control ................. 27

**Luncheon Speaker -- Presidential Address**

Mel Luthy  
Linguistics and the True Believers ........................................ 41

### Afternoon Session

Richard M. Trask  
(A)WAKE(N): A Study in Lexical and Grammatical Variation ................. 48

Mary Ann Christison  
An Introduction to Communication Theory: A Description of the Teaching Act .......... 60

V. Lynn Tyler and Robert F. Norton  
Enhancing Intercultural Communication: A Languetic Model .................. 69

Larry Browning  
What is Translation ............................................. 92

Richard G. Ellsworth  
Junction Grammar as a Framework for Psycholinguistic Analysis of Language ........ 97

Mike McOmber  
Some Proposals for Junction Grammar ........................................ 110
Dorothy Hansen  
Bi-cultural Aspects of Comprehension in  
the Book or Mormon  

134

MARCH SYMPOSIUM  

Morning Session  

Steven W. Durrant  
Chinese Chuckling and Abahai's Antidote  

141

Robert Fugal  
Wh Words from the Jakobsonian Point of  
View  

151

Mike McOmber  
Problems in Subjunction  

172

Alan Melby  
Some Comments on Intersection and  
Interjunction in Junction Grammar  

187

Marvin Folsom  
Martin Luther's Language is Dead  

199

Afternoon Session  

Roydon Olsen  
A Slide Presentation on the Status of  
TSI Research and Plans  

208

Jill Peterson  
Introduction to the Referment and Some  
Other Innovations  

221

Kenneth Lee  
The Information Net in Junction Grammar--  
A Discovery Aid  

231
The following people also participated in the symposium, but their papers were unavailable for publication in the proceedings.

John Harvey
KEYNOTE SPEAKER

Merle D. Tenney
Semantics and Syntax of Punctuation, A Junction Grammar Model

Arthur Henry King
A Linguistic Approach to Shakespeare

Eldon G. Lytle
Understanding the Alternatives of Translation

Daryl Gibb
The Book of Mormon Translation Question: A Paraphrase or Formal Translation?
WHAT IS DIGLOSSIA?

A noted linguist, Charles A. Ferguson, defined diglossia as:

... a relatively stable language situation in which in addition to the primary dialects of the language (which may include a standard or regional standards), there is a very divergent, highly codified (often gram­matically more complex) superposed variety, the vehicle of a large and respected body of written literature, either of an earlier period or in another speech community, which is learned largely by formal education and is not used by any sector of the community for ordinary conversation. (Ferguson, 1959, p. 16)

The most important factors to note here, that distinguish a diglossic condition from other language situations, are 1) that the superposed variety of the language or dialect is learned through formal education, that is, neither acquired nor normally spoken in the home and 2) that absolutely no one in the community uses the superposed variety for ordinary conversation with any other member of the community. This precludes such language situations as those which are commonly referred to as bilingual as well as those which merely have a distinction between polite and informal speech.

Both the superposed variety (which Ferguson calls "H") and the primary variety (which he calls "L") have their specific functions. Trudgill, a sociolinguist, says:

... This varies from community to community, but typically the high variety is used in sermons, formal letters, political speeches, university lectures, news broadcasts, newspaper editorials and high poetry. The low variety, on the other hand, is used in conversation with family and friends, radio serials, political and academic discussions, political cartoons, and 'folk' literature." (Trudgill, 1974, p. 117)

A person using either one of the varieties in the wrong context would be an object of ridicule. One using the H variety in his daily conversation would be looked at as rather weird just as one using the L variety when quoting a scripture in the text of a sermon would be considered uncouth.
Ferguson notes that:

... diglossia is not assumed to be a state which occurs always and only at a certain point in some kind of evolution e.g. in the standardization process. Diglossia may develop from various origins and eventuate in different language situations. (Ferguson, 1959, p. 2).

Also that it

... typically persists at least several centuries and evidence in some cases seems to show it can last well over a thousand years. (Ferguson, 1959, p. 10).

CANTONESE DIGLOSSIA

Cantonese is a prime example of diglossia. There are two distinct levels of language: one, "Yuh tai mahn," the formal form, is used by the more educated for virtually every situation requiring communication based on writing, and the other, "Baahk was mahn," the colloquial form, is used by everyone for daily conversation with any other person in the community. Natives of the language regard "Yuh tai mahn," which we will refer to as H, as being the proper form of the language and "Baahk was mahn," which we will refer to as L, almost as a slang.

Ferguson suggests:

... There is usually a belief that H is somehow more beautiful, more logical, better able to express important thoughts, and the like. And this belief is held also by speakers whose command of H is quite limited. To those Americans who would like to evaluate speech in terms of effectiveness of communication it comes as a shock to discover that many speakers of a language involved in diglossia characteristically prefer to hear a political speech or an expository lecture or a recitation of poetry in H ever though it may be less intelligible to them than it would be in L. (Ferguson, 1959, p. 7)

The written form has become so ingrained in the people that even when brought to an understanding of the necessity of writing in the L form for foreign students of the language, most Chinese cannot bring themselves to do it totally. (Bishop, 1977, p. 5)

The only way that the true L variety of Cantonese can appear in written form is by use of many 'coined' characters
which even the majority of educated Cantonese, let alone the uneducated, are generally unfamiliar with.

Here it should be noted that the 'coined' characters corresponding to the L variety are analogous to ungrammatical English forms such as "I ain't goin'" to a Cantonese. It is not accepted as correct speech in terms of written communication but could readily be acceptable on a spoken level. (Bishop, 1977, pp. 16-17).

EXAMPLES OF CANTONESE DIGLOSSIA

A common sight in Hong Kong is a little table and two stools just outside of a post office. Seated at the table will be a man more or less educated in Cantonese H and another Cantonese, usually of the older generation, who is illiterate. The latter will be conveying a message to the former in verbal Cantonese L which is then transposed and written down in Cantonese H in a letter to be mailed. What ends up getting mailed is not a verbatim quote but rather a formal representation of what was said.

A likewise common occurrence is a young adult at home reading an article from a Chinese newspaper written in H and either transposing it to L directly as he reads or reviewing it in L (after having first read it in H) for the benefit of a grandparent or younger sibling who has not had that education. (The ability of the Cantonese to "transpose as they go" when reading is truly unique. Many become so good at it that the listener could easily believe the article was originally written in L, not in H).

I will now play a tape recording of a text read by a native of the language, first as if it were for a youngster of preschool age and then exactly as it was written. (For those of you who do not speak Cantonese, the distinction to be made is somewhat akin to a situation in English where one was to read the sentence "Fine! I will do you." but respond verbally with "Ng-kay A'll duit for ya.").

The following is a graphic representation of the Cantonese L versus Cantonese H as read by the native speaker. (The first line in each pair is the L representation as it was transposed spontaneously from the original H of the second line. Lines drawn between characters in the pair of lines indicate equivalent representations in Cantonese L and H):
Bishop: Teaching Cantonese to LTM Missionaries

Contrast between Cantonese L and H

L 兩隻羊仔
H 兩隻羊

L 一隻白羊同埋一隻黑羊一齊嚟到一條窄橋咗兩邊．
H 一隻白羊和 一隻黑羊同時來到一條窄橋的兩邊．

L 咁條橋只可以讓一隻羊嚟到行過嘅．黑羊呢係要向東邊行到西邊；
H 那條橋只可以讓一隻羊走．黑羊 要從東邊走到西邊；

L 而白羊呢就 從西邊走對東邊嘅，但佢同時走到橋嘅中間嚟．
H 白羊 要從西邊走到東邊． 他們同時走到橋的中間．

L 黑羊話：我比你先過去，因為，你係應該退後然後讓我，過去嘅
H 黑羊 說：我比你先來， 你應該退後 讓我先走過去

L 白羊就講啦話：我應該比你先去嘅，你應該退後．等我過去．
H 白羊 說：我 比你先來到，你應該退後．让我過去．

1978 Languages and Linguistics Symposium
THE HK LDS MISSIONARY CONFRONTS DIGLOSSIA

One of the first contacts the LDS missionary will have with diglossia in Hong Kong is on his first Sunday when he sits with his investigators in the Sunday School investigator's class. He goes hoping to understand enough to be able to intelligently answer his investigators' questions and finds that he is required to nearly "learn another language" before doing so. Without any training in Chinese characters, he can't make heads or tails of the "ϊї"s (dik), the "тн"s (syut) or the "тп"s (taa) he hears which have replaced the familiar L equivalents of these words.

As he teaches discussions (which have been translated by native speakers who, you recall, have a strong dislike for "written L"), he finds that people give him puzzled looks as they hear his memorized Cantonese H when, because of the informal nature of the situation, they were expecting Cantonese L. The missionary assumes his tones are bad (which, granted, may have added to the confusion) and doesn't realize that he is using the right variety of language in the wrong context.

Can you imagine living in a country for two years, being almost totally unable to read or write and yet have to communicate the gospel message effectively to the people? You have to have someone translate every referral, read street signs for you, explain the scripture to you (in L) which you just asked him to read (in H), tell you what is on the menu before you can order, and pronounce his name which he has just written down for you. When the missionary does take up character study on his own he immediately runs into the problem of diglossia in connecting the L and H forms of words to get some familiar meaning.

THE LTM MISSIONARY

Well, what does all this have to do with the LTM? That's where it all begins. The LTM has done much recently to help alleviate this problematic situation. Missionaries are now informed in the LTM that such a condition (diglossia) exists, whereas before, they were left to discover it on their own. Through a new culture program, missionaries learn a little more about the language they will be speaking and are introduced to a few of those "ϊї"s (dik) and "тп"s (taa) so that it won't be such a shock to find the people using a "language" other than just what they were taught in the LTM.

Some additional help could still be given. Grammar texts could be scrutinized to correlate lessons using Cantonese L as well as H, being sure to differentiate between the
two. Missionary discussions which are translated by natives could be reviewed by non-natives so that they will eventually come out in the spoken rather than written form. (Native speakers of the language presently transpose the discussions from their present state into L when presenting them but non-native missionaries haven't this ability at first). A complete Cantonese dictionary relating L and H forms has yet to be written. Perhaps something of this nature on a smaller scale could be included in the missionary test materials. Though time is limited, perhaps some initial training in learning to read and write could be given in the LTM.

SUMMARY

In summary, I quote again from Ferguson:

... The problem of teaching a language with two major forms cannot be solved by teaching only one of the forms. I realize that there are teachers of these languages who feel the only satisfactory solution is just the H variety or just the L variety. It is no doubt possible that this solution is adequate for certain individuals who are studying the languages for certain limited purposes, but it is clear that this solution will not meet the needs of someone who wants to learn to understand, speak, read, and write these languages in a manner approximating that of the educated native speaker. The teacher and student alike must face the fact that there is more to be learned than one language; perhaps it is not as much as two full languages, but it is certainly more than is generally attempted in a single language course. All apart from considerations of the content and procedure of course, it seems clear that more time will be required to achieve results comparable to those obtained in other language courses... (Ferguson, 1963, pp. 72-73).

I submit that the LTM might consider this fact in the preparation of all text materials for their Cantonese speaking missionaries.
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I have a son who plays the piano by ear. Both hands. Melody, rhythm, chording and all. By some incredible magic he can pick out almost any piece, from familiar hymns to Beethoven sonatas. And he hasn't taken piano. He can't even read music. All he can do is play it. He doesn't have to think about it, he just lets the music come out the end of his fingers. But that's not enough. This same boy swims. Not like your ordinary swimmer. He is a fish-smooth, powerful and fast. He was a high school swim champion. Yes, my son is an athlete and a musician (not to mention his other fine qualities), and what's important here, he seems to have been born that way, born with what we call musical athletic talents or propensities.

Then there's his old man. Through some fluke of genetics, the father of this boy, though he studied trombone for many years, can't for the life of him figure out how to go about playing a piece of the piano by ear. Not even "My Country Tis of Thee." And although he learned to swim early in life, that same father can't put together in a respectable way the components of any but the sidestroke. In fact he moves through water with the grace of a trudging freighter in high seas. It's not that he hasn't tried to learn these things. It's evidently something or some combination of things that he just doesn't have working right. He's not wired for those things. It doesn't help for the son to say, "Dad, this piece is easy." Or, "Dad, the butterfly stroke is simple, just do what I'm doing. You can do it. You just have to FEEL it in your muscles. It's that easy!"

What does the appreciation of my son's special abilities teach me? Well, I enjoy languages. I enjoy learning languages, I enjoy designing language instruction, and I enjoy teaching languages. These things come relatively easy to me and I've had quite a lot of experience with them. What is not easy to understand is why anyone should find difficult what I find easy. Isn't it interesting that most language teachers you know and most language textbook writers are themselves skilled language learners. They not only know the language inside and out but they also know the technical language of grammar and phonetics. What they often don't know is what it is like to be a beginner, an unsure and perhaps untalented beginner.

If I were to take up piano or swimming at this point in life, I think I might rather have as my teacher someone with the same kind of psychological and physical barriers I face.
in these things, perhaps someone who overcame the barriers at a mature age in learning to swim or play the piano. At least he would be more likely to understand me in my predicament than would someone like my son for whom there are no such barriers.

My concern in this paper is with people who seriously need and want to learn a language in a short time, people such as missionaries, Peace Corps volunteers and the like. Also my concern is with language training programs such as the LTM which are designed to give the necessary initial concentrated language training to such people. You understand of course that these kinds of training institutes have to deal with the entire range of talent and motivation. The challenge of LTM is not like that of a football coach with a select roster of already accomplished and very promising athletes to organize and train for mock war on the gridiron. Not at all. The LTM's mission is to train all who are sent on foreign language missions. They may be fresh out of high school or they may be senior citizens, they may be farmers, grandparents, engineers, retired teachers, doctors, or others. Whoever they are they face the awesome task of learning a language well enough to function effectively in their new roles within a short period.

Let's step back and take a look at that for a moment. To learn a language well enough to function effectively in a new social role is no mean task for even a gifted learner to accomplish over several years' time. Even to assume a new social role, a new identity, a new projection of self, is no easy matter. To do that in a new language is simply awesome. We language professionals don't often admit to ourselves how truly awesome it is. In fact it almost seems as if there is a conspiracy to hide from ourselves, and certainly from the public, the fact that language learning, if pursued to the point of mastery, is a very long and enormously complicated process. Not one that can be programmed through a series of academic courses. Yet language mastery is the aim of every missionary sent to LTM, and he is not given much time to attain it.

Actually, of course, there is an extremely wide range among otherwise normal adults in their language learning abilities. At the top of the scale are the "natural athletes," individuals who learn all aspects of languages with relative ease, while at the other end is a significant percentage of people who, no matter how much they may need to learn or want to learn, and no matter how hard they try, experience great frustration in their attempts to acquire fluency in a new language. Yes, there have been some frustrated learners at LTM, some who have not been able to "put it together," And of course, what is more serious, there are some missionaries who even after several months in the
mission field still feel frustrated in their attempts to speak and understand the language.

Let me turn now to the more specific concern of my paper. It is these low-performance learners. More particularly it is the older people--referred to in the mission field sometimes as the "older couples." As a group the older people constitute a unique challenge to an intensive language training program. They come scared. Unsure. Even though they may have been able learners in their youth, they now feel at a disadvantage. It takes a great deal of faith and courage for them to undertake such a learning program.

I am interested particularly in this group of learners for two reasons. (1) I believe that they are capable of making important contributions to the solution of the world's problems if only they can equip themselves with communicative competence. And (2) I believe that from them we can possibly learn more about language learning and language teaching than from any other group.

Let me expand on these two reasons. It is not always the gifted language learners who are qualified in other important respects for given missions. In fact the men and women who are longest on needed skills and experience are seemingly often shortest on language learning potential. But think what it would mean if doctors and dentists, engineers and business managers, educators, agronomists, and others who are so plentiful in North America and the Western World could be equipped with the communicative competence to reach out and give of their expertise to the less fortunate people in the world. Rather than retiring to the rocking chair to play golf and watch the stock market and talk endlessly about their grandchildren, people could, if motivated and equipped, change the world. And their lives might be longer and happier. And what if the experience and know-how of bishops and counselors and quorum presidents and youth leaders and welfare directors and relief society workers and others with long and faithful experience in the Church, people such as we have in this area by the thousands and tens of thousands, what if these people could prepare themselves to contribute to the spiritual and temporal uplift of areas of the world that lack trained leadership.

If you are aware of what President Kimball has been saying about lengthening our stride, you know there is great need and the invitation for older people who can arrange their affairs to take on the challenge of a foreign mission. I personally believe that the LDS people will respond to this invitation in large numbers. The LTM will be crowded with older couple missionaries. And what a great uplifting power they will be in the mission field when they can master the language and become fully functional and comfortable in their roles.
Now as to what can be learned from older language learners. You are aware of course of the recent tremendous growth in research on language acquisition and language learning. Whole disciplines have evolved that have bearing on this research: psycholinguistics, sociolinguistics, various branches of theoretical linguistics, language teaching methodology and others. There are now shelves of studies on child language acquisition, on language teaching in the schools, on bilingual education and the like. But there is scarcely any research that has focused on the problem of acquiring a new language at the age of retirement. There is little research on adult language training designed specifically to facilitate and accelerate intensive learning for the frightened yet motivated language learner that most of our "older couple missionaries" are.

Why is this? It is a fact of history that most intensive language training programs are designed and operated mainly to accommodate a relatively homogeneous class for average learners. The program prescribed for all consists of uniform objectives, a uniform sequence of units and usually a set course duration. Such a program is optimally cost-efficient if a modest rate of attrition can be tolerated, i.e., if it is acceptable that some students in the program will fail or be severely frustrated. The training program is designed and targeted for a more or less uniform student profile, instructional and developmental costs are minimal, teacher training is standardized, and, if the student population more or less fits the profile, the attrition and low achievement rates can be kept at a tolerable level.

But given this policy, which as far as I know is the policy of all intensive language training institutions such as the Defense Language Institute (DLI), Foreign Service Institute (FSI), and Language Training Mission (LTM), there has been little effort invested in developing approaches or techniques or materials of a philosophy suited particularly to the needs of persons who do not fit the standard profile. Our instructional programs are not very adaptive. They don't easily accommodate the special needs of students who don't fit the pattern.

Now to such agencies as the Peace Corps (PC), the state department, or the military it may not be counted a very serious matter to lose some of their trainees; there are always more to take their place. But in the matter of a mission call it is different. Crippled communicators are a liability. A frustration to themselves and others. That is why I think that vigorous research is now in order to discover how best to help older people equip themselves with a new language and adapt themselves to a new role. Although we have by no means exhausted what we can learn about learning and teaching from research on child language acquisition.
or on strategies and techniques of successful, skilled language learners, from research on bilingualism or on language teaching in the schools, I believe that the most promising new frontier of research on language learning for right now will be in the intensive learning of foreign languages by older people in such programs as the LTM and the mission field. For one thing, this involves actual (or seriously attempted) language acquisition, not just academic exercise in language acquisition, and for another, it focuses on a population of learners rarely considered before.

If that research contributed only to increase our effectiveness in teaching older people, it would be well worth the investment. But I suspect that such research might also yield answers to more fundamental questions we have about language acquisition. Hence I submit that research on this frontier has important scientific as well as very practical implications.

Now I'll let you see some of my personal biases in what I would recommend as some first very practical assumptions that might underlie such research. Although we have recognized that different people learn in different ways and that in language training one man's meat may be another man's poison, we haven't followed this recognition to its logical conclusion: that solutions to many of their problems may be found in the manipulation of instructional alternatives, that low language learning performance of older couples may be more a product of inflexibility, non-adaptive, impersonal approach or other qualities of our instructional systems than it is of factors such as language aptitude (or method aptitude?) that are resident in the student. And that by introducing certain changes into the instructional system we may be able to accommodate the needs of these older learners, by shaping the learner to the method or the method to the learner, or perhaps the learning style of the learner to the teaching style of the instructor or courseware. I would suggest first, then, experimentation with different language training designs, perhaps designs that would allow greater flexibility, that would be more adaptive or personalizable to accommodate the special learning needs and problems of learners whose performance is substandard. I wonder if we cannot anticipate and prevent learning problems before they emerge if we have an instructional system that is rich in content, scheduling, and methodological alternatives, a system that provides effectively for individualization particularly in the exploitation of content and methodological alternatives at the discretion of either the learner or the course supervisor. Let me explain.

I assume that as the art and science of language instruction develops further, the relation between the student, the instructor and the program of instruction will
more nearly parallel the relation between a patient, a physician and a program of treatment. A physician prescribes treatment based on diagnosis and on the accumulation of what he has learned from his own experience treating similar cases, supplemented by what he has learned or can find out from the medical experience of others in treating similar cases. For many cases, where the diagnosis is unambiguously clear and the remedy nearly 100 percent reliable, the doctor can confidently and safely prescribe the same specific treatment for all patients. This is the rifle method, impressive when the aim is sure and the weapon lethal. Many programs of language instruction rest safely on the assumption that a single-track, single menu (table d'hôte), rifle-method approach is adequate for the majority of learners regardless of individual differences. But of course in medicine (as in language learning) not all patients nor all conditions respond alike to the same treatment. In many cases a physician may attack a problem with the shotgun method; he may, for example, prescribe a compound treatment containing several possible remedy components, one or more of which is likely to work in a given case and none of which is likely to injure the patient. So in language training in recent years our more sophisticated programs have attempted to accommodate some student differences through optional supplementary resources and/or multiple-track programs that provide a higher degree of flexibility than the traditional lock-step training course. But just as the highly available, inexpensive patent medicines fail to satisfy the needs of all patients with similar complaints, so also auxiliary resources and multiple-track language courses do not solve all of the problems confronted in the more traditional configuration.

In cases where conventional or patent remedies are not the answer, or where the diagnosis is complicated, a different approach is necessary, an approach that required more experimentation and close cooperation between patient and doctor if a satisfactory treatment program is to be discovered. This approach might be called one of individual experimental accommodation. In this approach it must be recognized that the critical variables of a treatment may not be found in the disease-causing agent alone, but rather, or also, in features of the patient's system. For example, his system may not tolerate treatment with antibiotics. (The language learner may not tolerate treatments with grammar!) In these cases both the patient and the physician run certain risks. To a patient who wants to believe that medical science has absolute answers to every problem it may be a shock to hear his doctor confess that he is uncertain of the diagnosis or that proper treatment of the condition is uncertain. The patient may look for a doctor who is more reassuring—though perhaps less honest. But for the patient who understands something of the complexities of medical
diagnosis and therapy there is no need necessarily for alarm at such a confession. He may be brought to realize that he, the patient, is critically important in helping the doctor diagnose the condition and in implementing a carefully controlled program of cooperative experimentation.

This approach, that of individual experimental accommodation assumes that teaching must be subordinated to learning; that the learner--particularly the low-ability learner--must become a partner with the instructor or course supervisor, giving feedback as to the effect of various learning tasks, techniques and strategies on him; that teacher and learner must cooperate so as to discover how best to exploit all the resources available, including time, materials, background skills and knowledge, propensities, preferences, habits, etc., etc.

In attempting to account for the fact that adults learn languages with varying degrees of efficiency and success, we may be tempted to attribute the difference mainly or even entirely to differences in "language aptitude," "intelligence," or other relatively unchangeable native endowments or acquired propensities. But the difference between high and low performance language learners may in fact be due in large part to one or more factors that are subject to change through training. It is probably the case that the more efficient language learners know something or do something or have something that the less efficient do not know or do not have. Assuming this to be so, we are asking the question whether the less efficient (but otherwise normal) student can be led to acquire some of whatever it is their more successful peers have in the way of cognitive knowledge, efficient learning strategies, confidence and other positive attitudes, habits, etc., any of which could compensate for other deficiencies.

From experimentation with data-processing models of learning carried out by Gagne, Rohwer, Paivio, and many others, it seems probable that for some learners the initial steps of language learning can be significantly accelerated and smoothed by the use of various kinds of elaborative prompts, distinctors and mnemonic facilitators. From experimentation with Gattino's "Silent Way" tactics it appears probable that for certain learners learning can be facilitated by withholding the types of prompts that characterize current language teaching practices, forcing the learner to develop his own hypothesis-testing strategies and his own "inner criteria of rightness." From experimentation by Asher and others it is suggested that some language learners may be severely disadvantaged, even "traumatized," by a training sequence that places early emphasis on the development of speech skills before an adequate foundation of receptive skills is built. In short, these and other lines
of experimentation lead us to believe that effective techniques and strategies for language learning can be taught, that low-ability learners can be trained to learn efficiently.

Just as the last few years have seen, I think, a productive marriage between BYU and the Translation Services Division in the investigation of translation theory and process, so it seems to me it is time for a marriage between BYU and the LTM in research on language acquisition and language training. Now is the time for a genuine interdisciplinary concerted research effort. We need to know now what we could have learned if research had been joined 10 years ago. We cannot wait for the rest of the world to give us the solutions we need. They may not yet be asking the questions that are staring us in the face. If we are to move ahead with better solutions over the next decade we must invest now in research and experimentation in order to construct a viable theory of second language acquisition and design language training accordingly. And one area where the need is demonstrably acute and the potential high for a significant pay-off is that of language acquisition by older persons.
THE TICCIT-ESL PROGRAM
AT BRIGHAM YOUNG UNIVERSITY

Frank R. Otto
and
Janene Marrott

General Background Information

In cooperation with the Hazeltine Corporation, BYU has developed and refined a unique computer-assisted instruction system called TICCIT (Time-Shared Interactive Computer-Controlled Information Television). The TICCIT project uses state-of-the-art computer and television technology utilizing hardware consisting of two minicomputers and 28 color T.V. student terminals.

A limited number of experimental TICCIT-ESL segments have been used successfully to accompany regular ESL classroom instruction at BYU since September, 1976. Students and teachers are very enthusiastic about TICCIT and have asked repeatedly for courseware to be expanded and made an integral component of the ESL program. The TICCIT system has been extremely effective in the following ways: Instructional design is based on the principal of learner control accountability and provides for self-pacing; the instructional pattern is highly interactive, requiring students to participate by responding constantly to questions and usage; teachers are freed from many time-consuming, routine, and sometimes monotonous tasks, thereby allowing more time, effort, and creativity for more meaningful individualized diagnosis and instruction; course content can be readily revised to meet needs of teachers and learners. The system has a remarkably flexible authoring format.

The TICCIT course is organized somewhat like a textbook series; whereas texts are broken down into chapters, sections, and sets of exercises, TICCIT courses are broken down into units, lessons, and segments. A map identifies lessons within each unit and within each segment. Students also know exactly where they are in TICCIT course materials because of a unique system of color-coded boxes that reminds students of their progress.

Once students begin actual course work, color-coded boxes are used to lead students through a variety of learning activities on the computer. Students progress according to the following criteria. 1) A black box indicates that the student has not been working with this particular concept previously but should be prepared to proceed with the
new material presented. 2) A yellow box indicates that the student has been working on this area but has not passed all of the requirements necessary to proceed. 3) A green box indicates that the student has satisfactorily completed the area, understands the concept adequately, and is free to proceed by following the map provided. 4) A red box indicates that the student definitely needs more exposure with the concept emphasized; in fact, a red box usually indicates that the student has failed this area of expertise. 5) A blue box indicates that the material is optional. The student may or may not proceed with material in this area. Most students review material in blue boxes but they are not required to do so. 6) A white box indicates that there is an off-the-system assignment to be completed before proceeding to the next level indicated on the map.

Another feature of the system that is designed to assist students is the ADVISOR function. In order to find out how many practice problems students are expected to complete in order to pass any given segment, they are instructed to press ADVISE. The advisor will sometimes give unsolicited advice. In any case, each student is expected to work on the problems until he/she feels confident enough to move on. Students are instructed to press the ADVICE key in order to obtain feedback concerning their progress.

Function of the TICCIT Keyboard

In order to give you a feeling of how the TICCIT-ESL program appears to students, it is desirable that you have some familiarity with the TICCIT keyboard. The following descriptions will be most useful to you.

1. Center Keyboard

The center keyboard on TICCIT closely resembles a standard typewriter keyboard and is easily mastered by ESL students.

2. Right Keyboard (Learner Control Keys)

   a. RULE - The Rule key assesses you to a concise statement of the concept or procedure you should learn in the segment. It usually contains no examples, only an explanation or statement of the concept.

   b. EXAMPLE - Each time you press EXAMPLE you will see a new problem (a sentence, word, or statement) that has already been solved. You do not answer anything on an example page. You merely read the page to see an example of the concept.
c. PRACTICE - The Practice is probably the most popular part of TICCIT because it allows you to interact with the computer. The computer will present you with one question or problem and you can type your answer. Press PRACTICE again to see the next problem.

d. HELP - There is a Help for Rule, Example, or Practice. If you are looking at the Rule and you press HELP, you will see a more detailed version of that Rule, with examples and step-by-step explanations. If you are on Practice or Example and you press HELP, you will see the answer to that particular problem as well as an explanation of how the problem relates to the Rule.

e. HARD - Pressing the HARD key while looking at the Rule will give you a technical, harder version of the Rule. Pressing the HARD key while looking at Examples or Practices will give you harder problems. Some segments do not have harder problems. The advisor will tell you if this is so.

f. EASY - The easy version of the Rule is usually a simplified version with cartoon-like pictures to help illustrate the point. When you are on Medium or Hard practice or examples problems, the EASY key will let you step back down to Easy problems.

g. OBJECTIVE - The objective gives you a statement of the task you should complete on a unit, lesson, or segment level. You automatically get the objective when you press GO on Lesson Map, but you can return to the objective anytime by pressing OBJ'TIVE.

h. MAP - Pressing the MAP key will take you to the next highest map. For example, if you were on a Rule page, you would move to the Lesson MAP. Your blue arrows would still be pointing to the segment you were in. If you were in a Lesson Map, pressing MAP would take you to a Unit MAP.

i. ADVICE - Often you will get advice without asking for it. These advisor messages are system messages that pop in whenever the system thinks you need help. But when you are in a segment, you can ask for advice by pressing the ADVICE key. You will see a score for your work on the segment. Use this page in evaluating your performance in the segment, but feel free to ignore any advice. Trust your own judgment.

j. GO - The GO key is used for several functions. On a map, pressing the GO key will move you to whatever box the blue arrows are pointing to. So be sure your arrows are in the right places before you press GO. In practice problems with more than one part, pressing GO will take you to the next part.
k. SKIP – The SKIP key is used infrequently by the student. The only time you'll need to use this key is in a test. If you have gone backwards in a test, you will use the SKIP key to return you to the item you want.

l. BACK – The BACK key can be very useful. It allows you to re-answer a question or to return to the same question after seeking Help.

m. ATT'N – The ATTENTION is used to get the attention of the computer. When you want to log off, log on, or move to the student menu (map), you must first press ATT'N.

n. EXIT – Use EXIT to return to the course material from an advisor message.

o. REPEAT – Pressing the REPEAT key will redisplay the screen exactly as it was when you first saw it. This key is particularly useful on practice pages when you type over some original text and you've forgotten what the original looked like. Pressing REPEAT will give you back the text, delete any changes you made, and repeat any audio messages.

3. **Left Keyboard (Editing Keyboard)**

   a. 

      | ← | → |
      | ▼ | ▲ |

   The four keys allow you to move the cursor, the box where you type your answers, whether up, down, right, or left.

   b. MARK – The MARK key is used in Practice. Whenever you are asked to mark a word or character, you must move your cursor to that word and then press MARK.

   c. NOTE – The NOTE key is your communication link with the computer staff. If you see an error in a display, or if something about the text is unclear, press NOTE to write a message to us. If you need more than one line, press NOTE again after typing the first line, and you'll get a second line. Some of our best feedback from students results from this feature.

   d. TAB – The TAB key moves you quickly from box to box. You use this key when you first log on to help you indicate your segment.
e. **ERASE** - Pressing the **ERASE** key will erase everything on the line following your cursor. If you want to erase only one space, use the space bar on the center keyboard.

f. **INSERT** - The **INSERT** key allows you to insert blank spaces in a line of text. After you move your cursor to the place where you want the extra space, just press **INSERT**. You'll see a message asking "How many spaces?" Type the number that you want (up to 9). If you want a whole line, type *. Then press **ENTER**.

g. **ENTER** - This key is the one used most on TICCIT. It serves three functions: 1) To turn pages in any part of **TICCIT**, just press **ENTER**. 2) To notify the computer that you have finished typing, press **ENTER**. You'll use **ENTER** after you answer a question, in logging on, logging off, writing a note, using **INSERT**, after you type a number on a map, and anywhere else when you have completed a task. 3) Often you're allowed to try again when you miss a practice problem. If the feedback says, "Try again," you may press **ENTER** to do so.

**TICCIT/ESL and Evaluations**

A test must be taken for each lesson in the **TICCIT** course. Each test contains problems similar to those found in the segments listed on the map. It is best to work the practice items in those segments before taking the test; however, if students are familiar with the material, they may challenge the test without doing any work in that particular lesson. If students fail the test in their first attempt, they may review the test by following the instructions on the score sheet frame. To take the test for the second time, they must complete a sufficient number of practice items correctly in order to turn the boxes green. If students fail the test in their second attempt, they must complete all segments boxed in red in order to turn them green. If students fail the test in their third attempt, they must complete all segments and turn all boxes green and the test must be administered under the supervision of a proctor. Students are instructed not to enter any answers on their third attempt without checking them first with the test proctor.

The grading system for **TICCIT** is based upon the concept of learning for mastery. Arbitrarily, we have established 80 percent as the level of proficiency at which we want students to perform before proceeding with additional lessons. The **TICCIT** system was designed to help students accomplish the following objectives: 1) To achieve mastery for each of the required lessons by passing the mastery test, preferr-
ably the first or second time. 2) To learn efficient learning strategies and self-discipline in order to complete the lessons scheduled during the semester for a particular level of instruction. 3) To remember and use what they have learned at a later time by reviewing the most important concepts regularly. (This review and re-entry pattern is provided by the course work.) 4) To become more confident and proficient with paper and pencil tests.

Authoring TICCIT

Authoring for TICCIT is relatively simple. There is no need to learn a programming language in order to generate the displays. In order to author a segment effectively on TICCIT, very specific objectives must be outlined for students to accomplish. For example, a typical objective would be to have students correctly use certain adverbs of time. To expect students to correctly use all adverbs would be an unrealistic task for one segment and would lead to a very confusing display.

The RULE for TICCIT is a very basic explanation of the concept. It should contain the theory necessary for the students to successfully complete the practice problems. The RULE may include steps in a process to be followed, the critical aspects of the concept taught, or just additional information describing grammatical functions. It is imperative to keep the explanations as concise as possible. Our experience has been that long rule statements tend to bore the students. The RULE is tailored for the student who picks things up quickly with just an explanation. The RULE HELP is for the student who doesn't grasp concepts as rapidly. It may be an expanded form of the RULE, with examples showing how the rule applies in each case, or it may include some mnemonics or other helpful background information.

The RULES and RULE HELPS are the easiest materials to prepare for entry on the computer. The authored material is formatted on grid sheets which have the appropriate number of spaces across and down to correspond to available space on the TV screen. Within this 16 x 43 space area words may be colored, underlined and illustrated in special ways with arrows, boxes and/or graphics.

The practice problems are the most complicated but most popular part of the TICCIT course work. Depending upon the type of task to be taught, practice problems may range from simple true-false questions to complex editing problems. Typical questions handled well by TICCIT are true-false, multiple-choice, fill-in-the-blank, marking key words, and word-order editing.
After determining the type of question message to be used, the practice items are written to cover adequately the point of grammar being emphasized. To assure that the student will see at least one type of practice item for every problem encountered, practice items are arranged in sets. Within each given set, the items are randomized so that students will be forced to think about answering each question related to the grammar point being studied.

The pass level for each segment is normally two sets of practice items. Hypothetically, if seven practice items equal a fair representation of the concepts in the rule, the students would be required to answer fourteen questions correctly. Taking into account that not all students will get all problems correct, at least two more sets of seven problems are written to assure that the slower students will get enough practice. Twenty-eight practice items, then, are required for this particular segment.

At this point it is relatively simple to formulate the EXAMPLE message--merely a message which points out a highlighted part of the practice item. For example, the message for one of the segments might say, "The blue word in the sentence below is an adverb of time."

The most time consuming part of the authoring process is the formulation of the EXAMPLE HELPS and PRACTICE HELPS. Often, for the sake of sanity, the PRACTICE or EXAMPLE help is to explain each of the 28 items written in terms of the RULE for this particular segment. In other words, if students are confused as to why yet is an adverb of time in a sentence they see under the example button, they can press the HELP key to explain specifically why yet works as an adverb of time here. Similarly, if students miss a practice item, they can hit the HELP key and find out why they were mistaken. Some problems require a step-by-step explanation, and other problems may only require a corrected version of the problem.

A segment written by a beginning author may take anywhere from one to three weeks, depending on the difficulty of the material to be taught and the number of graphics and special effects required. A more experienced author can complete a segment in eight to ten hours.

In summary, the exciting thing about TICCIT authoring is not necessarily that it winds up on a sophisticated computer, but that material written by those specifications actually is more instructionally sound than the material often used in the classroom. The reason for this is that the author is involved with stating his RULE in a number of clever ways, and he/she must constantly double check and revise his RULE to make certain the RULE covers all the 1978 Languages and Linguistics Symposium
points necessary to properly answer the practice items. TICCIT also can administer mastery tests at the end of every lesson to insure that the students have retained and synthesized the concepts covered in the segments of that lesson.

We are pleased with the progress that we have made to date and are convinced that we are making a significant contribution in terms of scholarly research and exemplary materials development in the area of computer-assisted instruction in English as a Second Language. We encourage you to contact us if you are interested in receiving our CAI-ESL Newsletter or if we may be of further assistance in clarifying or expanding information provided in this brief article.
MEASURING LISTENING INDIRECTLY
THROUGH MONITOR CONTROL

Harold S. Madsen

Overseas requirements to evaluate the aural competence of large numbers of students, coupled with contemporary research in testing and in language acquisition, have prompted serious investigation into the feasibility of alternate modality listening examinations. For example, in Egypt alone, two million secondary-school students are required to study English and to become proficient in oral skills as well as in reading and writing. All students are evaluated annually in nationally sponsored exams, but no satisfactory method has yet been identified to asses their listening or speaking ability. And even if an appropriate instrument were available, there are insufficient facilities, equipment, and personnel available nationwide for large-scale conventional aural testing. These are the needs which have prompted experimentation with alternate-modality listening tests.

Interest in indirect measurement of language skill is of course not new. Reasonably successful language aptitude batteries have been available for decades (Carroll and Sapon 1959; Pimsleur 1966). And indirect measures of writing skill, as found in the TOEFL exam, for example, have demonstrated high concurrent validity. Indirect measures of listening and speaking, however, have not proven as successful. Despite the ingenious efforts of many, the United States Foreign Service Institute, to mention only one example, stands by its costly interview procedure as "the most valid measurement of general speaking proficiency currently available" (Jones 1975:4). Paper and pencil tests of pronunciation had become suspect even when discrete measures of listening were still in vogue (Harris 1969:90).

Nevertheless, test research points towards a possible breakthrough. Bernard Spolsky has postulated that indirect test devices could be developed as surrogates for more expensive direct evaluation procedures (1968:88-94). And ESL test expert John Oller, in reviewing integrative test research carried out in recent years, likewise advances this hypothesis. He notes, for example, that written cloze tests when correlated with a variety of subtests always tend to have the highest relationship to listening comprehension tests, despite the fact that the former include neither phonology nor the tight time constraints of the latter. And he even suggests the feasibility of substituting one modality for another:

Languages and Linguistics Symposium 1978
For example, with non-native speakers, it should be useful to compare performance on a written cloze test with performance on an oral cloze test. If the correlation is sufficiently high, it would be possible to substitute one type of test for the other. (Oller 1973:108; see also Clark 1975:11; and Oller et al 1972)

Given the feasibility of an alternate modality listening test, it is now useful to consider research findings that might suggest the special properties and constraints of the surrogate exam. Recent language acquisition studies, it happens, are particularly instructive.

Experimental research by Dulay and Burt on the order of difficulty of grammatical morphemes (or functors) strongly suggests universal language acquisition strategies among child second language learners, regardless of language background (1973, 1974). And Taylor points out important cognitive similarities in child and adult acquisition of language (1974:33). Bailey and others corroborate this view with experimental work which discloses a high degree of agreement in the difficulty of various grammatical structures for children and adults, and between adults of various language backgrounds (1974:242). Diane Larsen-Freeman has replicated and extended the comparison of adult and child order of acquisition studies and has examined the effect of varying data collection measures. She has found, as had Bailey and others, that the Bilingual Syntax Measure (BSM) provides a very strong correlation between acquisition orders for people of differing language background and ages, but that this does not hold for all of the other measures used. She speculates that such lack of consistency might be due to one or more causes: "modality differences, specific task effects, skill differences, etc. (1975:418; see also 1976)" Krashen and others corroborated and extended the Bailey findings (Krashen and Seliger 1976; Krashen and others 1976).

Moreover, Krashen hypothesized that the inconsistent Larsen-Freeman results across varying data collection tasks stemmed from and illustrated the very nature of adult language learning. Positing a Monitor theory, Krashen suggested that even in formal school-type settings adults master language through two processes: 1) acquisition or unsystematic exposure much as children do their native language, and 2) learning or a systematized, step-at-a-time procedure with regular feedback. Under proper conditions, the formalized, rule governed system imposes itself and monitors output. Referring to Larsen-Freeman's results using the BSM and supplementary evaluation instruments, Krashen reasoned that:

one feature these supplementary tests had in common is that they allowed more response time (and hence more
processing time) than did the BSM, and that during this extra time subjects were able to involve more consciously learned linguistic knowledge in their responses. Thus, the change in difficulty order may have been brought about by the subjects' having altered their output, under the influence of a consciously learned and more idiosyncratic pedagogical grammar. (Krashen and others 1976:150) [In brief, then,] according to Krashen's Monitor Model, adult second language performers depart from the child's L2 order when monitoring time is allowed and when they focus on form. This accounts for Larsen-Freeman's results with written tests. (Krashen and others 1977:340)

As a result of his research, Klein noted over a dozen years ago that monitoring of one's own speech is necessary in order for the individual to control his thought processes and verbal expression; moreover, he even traced the rationale for this to Freud at the turn of the century (Klein 1965:242, 269, 270). Subsequent experimental studies have borne this out (for example, Holzman and Rousey 1970:240:241; Webster and others 1970; Klein and others 1970; Yudkovitz and others 1973; Belmore and others 1973). Labov indicates that constant audio monitoring is needed for the maintenance of prestige forms learned later in life. Even school teachers, he says, use nonstandard English "in their most casual speech," when "the minimum attention is given to the speech process." (Labov 1969:17, 15). Audio monitoring can also be disrupted by great excitement, intense interest in a subject, fatigue, distractions, and by being unable to hear oneself (Labov 1969:33-34). It should be noted as well that people vary considerably in their ability or inclination to monitor themselves (Krashen 1977:156-158).

While there is wide agreement that we need to hear what we say, minimize slips of the tongue (Bolinger 1975:389), and monitor prestige forms learned as adults, there are those in language acquisition who do not accept Krashen's Monitor Model (Hatch 1977, Frazier 1977). Nevertheless, it is not only compatible with recent research findings, cited above, but it also helps account for the sometimes dramatic differences in ESL and foreign language classes between high performance on a written classroom exercise and bumbling oral production. Krashen holds that adult second-language performance is based on the acquired system, the learned system functioning simply as monitor. Tests that permit the operation of the monitor will result in "idiosyncratic" errors, which "reflect each learner's conscious mental representation of linguistic regularities in the target language (Krashen 1977:152, 154)." It follows that reasonably accu-
rate language which results from labored, analytical monitoring may represent an unrealistic index of the person's actual ability to communicate. There would seem to be an advantage, therefore, in eliciting acquired rather than learned language, by not permitting the monitor to function. This is possible, according to Krashen and others, by concentrating on natural conversation or communication rather than on language form, and by carefully limiting processing time. ESL test specialist Upshur concurs on the need to control processing time (1975:59).

METHOD

Examination format. --In determining what test format to employ in the AUC experiment, it was of course decided to select a "communicative" type exam. A variety of reports on cloze tests initially recommended this format. It is communicative, and it does not focus on language form. Also it correlates well with tests involving listening (Irvine and others 1974; Oller and Conrad 1971, Oller 1973). For example, compare the correlations of various tests (including cloze) with the listening comprehension section of the internationally administered Test of English as a Foreign Language (TOEFL):

\[
\begin{array}{ccccccc}
\text{Engl. Vocab} & \text{Read. Writing} & \text{TEOFL} & \text{Accept. Dict.} & \text{Struct. TOEFL} & \text{Comp. Abil.} & \text{Total}\ \\
\text{List} & \text{Comp. TOEFL} & \text{TOEFL} & \text{TOEFL} & \text{TOEFL} & \text{TOEFL} & \text{TOEFL (minus list.)} \\
\end{array}
\]

\[
\begin{array}{ccccccc}
.69 & .56 & .63 & .68 & .77 & .76 & .69 \\
\end{array}
\]

(Adapted from Irvine et al 1974:249, 251)

Except for the adjusted total on the TOEFL, the cloze test showed the highest correlation, higher even than dictation with its aural component. While Harris (1969:20) indicates that correlations in the .70's or .80's are adequate in equating two tests of the same skill, it was decided to demand performance in the upper portion of this range--where we might safely assume the two measures were "tapping an underlying competence" (Oller and Streif 1975:33). Despite the communicative focus in cloze, we decided to select a test type that would be less conducive to monitoring and thereby more likely to generate a higher measure of concurrent validity.
Even though our prospective test would be in a printed rather than an oral modality, it was deemed important to avoid tasks which would incorporate extensive traditional reading tasks. For placement test studies at AUC between 1974 and 1976 indicated a correlation of only .65 between the reading subtest of the Michigan Test of English Language Proficiency (MTELP) and the Michigan Test of Aural Comprehension (MTAC). Referring to Table 1, we see a very similar relationship between the listening and reading subsections of the TOEFL, a correlation of just .63. This meant avoiding printed versions of lecturette, for example.

It was finally decided to utilize standard listening comprehension-type items as found on the CELT, the Michigan, and the TOEFL (excluding the lecturette items on the TOEFL). These short, simple conversation items would provide the desired communicative focus while avoiding complex reading comprehension tasks. To further restrict monitoring, a strict time limit would be imposed.

The alternate modality listening examination (AMLEX) consists of two sections of conversational utterances. Section one consists of 45 questions requiring appropriate responses:

example: How far is it to Helwan?
A. No, not far
B. South of Cairo.
C. About 20 kilometers

Section two consists of 45 statements requiring selection of an appropriate paraphrase:

example: They work all but three months of the year.
A. They work nine months.
B. They only work three months.
C. They work every three months.

Subjects. --Two groups of native Egyptian applicants to the American University in Cairo were administered the AMLEX, the Michigan listening test (MTAC) and the Michigan battery (MTELP). These consisted of 72 graduates from Egyptian colleges and universities as well as 73 undergraduate transfers and graduates seeking admission to the AUC Management program, or a total of 145 applicants. In a follow-up study, two groups of Egyptian students who were enrolled in the English Language Institute at AUC also sat for the three examinations, 115 first semester and 94 second semester.

Procedure. --To counter practice effect, half of each of the two groups of applicants to AUC took the alternate
modality listening test prior to the Michigan listening test; the other half of both groups took the Michigan listening test first. A strict 25-minute time limit was imposed on the alternate modality exam (3 minutes more than the 90-item commercial listening test requires). This alternate modality test and the Michigan were administered the same day. Follow-up groups observed the same procedure, half sitting for the AMLEX first, the second half taking the MTAC first; however, in the follow-up administrations the two tests were administered on different days. The first semester group was limited to 25 minutes on the alternate modality test, but to assess the impact of the time restriction the second semester group was given 35 minutes—ample time, it was felt, for the Monitor to intervene.

Alternate modality exam papers of the 145 AUC applicants were triple scored in order to determine the optimum scoring procedure. The first score was simply the percent of the total items that were correct. The second score incorporated a standard guessing correction.\(^1\) The third score represented the percent correct out of those attempted, thereby minimizing the effect of the time restriction. To assess the three scoring procedures, each set of scores on the alternate modality test was correlated with scores obtained on the Michigan listening test. The AMLEX scores generating the highest correlation would identify the best means of scoring the surrogate listening exam.

RESULTS

Results of the Pearson product-moment correlations based on the triple-scored alternate modality (AMLEX) tests and the Michigan listening test (MTAC) indicate that the highest correlations occur when the guessing correction is imposed. The lowest occur when the time factor is minimized, the Management applicant group dropping from .82 to .73 (see Table 2)

\[ R = \frac{W}{D - 1} \]

\(1\) The formula is \( R = \frac{W}{D - 1} \); the number right minus the number wrong divided by the number of distractors, minus one. Thus with three distractors, the correction factor consisted of the number correct minus the number wrong divided by two.
Table 2

Comparative Correlations between the Alternate Modality Listening Examination (AMLEX) and the Michigan Test of Aural Comprehension (MTAC) Utilizing Three Scoring Procedures for the AMLEX

<table>
<thead>
<tr>
<th>Score 1 (% correct)</th>
<th>Score 2 (% correct of attempted time discount)</th>
<th>Score 3 (% correct of guessing correction)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grad. Applic's (N = 72)</td>
<td>.84</td>
<td>.86</td>
</tr>
<tr>
<td>Mgt. Applic's (N = 73)</td>
<td>.80</td>
<td>.82</td>
</tr>
</tbody>
</table>

Both groups are consistent across the three measures. Applying the Kuder-Richardson Formula 21 to the graduate applicant data, we obtain a reliability figure of .969.

The relationship between performance on the surrogate listening test and on the commercial proficiency battery was likewise determined through Pearson product-moment correlations (see Table 3).

Table 3

Comparative Correlations between the Alternate Modality (AMLEX), the Michigan Listening (MTAC) and the Subscores and Total of the Michigan Test of English Language Proficiency (MTELP)

GRADUATE APPLICANTS (N = 72)

<table>
<thead>
<tr>
<th>AMLEX</th>
<th>MTAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grammar</td>
<td>.85</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>.73</td>
</tr>
<tr>
<td>Reading</td>
<td>.74</td>
</tr>
<tr>
<td>Total MTELP</td>
<td>.88</td>
</tr>
</tbody>
</table>

MANAGEMENT APPLICANTS (N = 73)

<table>
<thead>
<tr>
<th>AMLEX</th>
<th>MTAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grammar</td>
<td>.81</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>.65</td>
</tr>
<tr>
<td>Reading</td>
<td>.62</td>
</tr>
<tr>
<td>Total MTELP</td>
<td>.79</td>
</tr>
</tbody>
</table>

The surrogate test was consistently a better predictor of subscores and total score on the battery. The highest subscore correlation for both groups was with grammar, virtually as high as the correlation in Table 2 between the surrogate and commercial listening tests. The performance of
the commercial listening test parallels that reported by Irvine and others (Table 1), correlations with grammar and total score being higher than with vocabulary and reading.

In the follow-up administrations of the alternate modality test and the commercial listening test to students enrolled in the English Language Institute at AUC, the timed AMLEX again reaches the .80's while the untimed AMLEX drops into the .50's (Table 4).

Table 4
Comparative Correlations between the Alternate Modality (AMLEX) and the Michigan Listening (MTAC) With and Without Time Restrictions

<table>
<thead>
<tr>
<th></th>
<th>ELI First Semester</th>
<th>ELI Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 Min. Timing</td>
<td>.82</td>
<td>Relaxed Timing</td>
</tr>
<tr>
<td>(N = 15)</td>
<td></td>
<td>(35 Min.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(N = 94)</td>
</tr>
<tr>
<td></td>
<td>.82</td>
<td>.57</td>
</tr>
</tbody>
</table>

DISCUSSION

Concurrent validity measures of the alternate modality examination consistently achieved experimental objectives with correlations in the .80's when a 25-minute time limit was adhered to. These correlations of .86, .82, and .82 are sufficiently higher than the .76 correlation between cloze and listening to recommend the surrogate test over traditional cloze as a measure of listening comprehension proficiency. But the reliability estimate of .969 is undoubtedly inflated, since a number of persons failed to complete the exam.

The significance of the time restriction is borne out in two sets of data. First, when time was discounted by scoring the percent correct of those attempted by AUC applicants, correlations dropped from .86 to .81 for graduate applicants and from .82 to .73 for Management applicants. Presumably the lower correlations reflect greater intrusion by the Monitor. The second set of data (Table 4) reflects an even greater difference when time was discounted. One explanation for this greater difference is that during the test administration to AUC applicants, all were aware that a strict time limit was being imposed; thus we can assume that virtually everyone would be striving to answer the questions as quickly as possible, thereby restricting Monitor function. On the other hand, the second-semester ELI group realized they would have ample time for the test, thereby encouraging Monitor function.
In a personal conversation, John Oller has suggested a second possible explanation for the modest .57 correlation. Rather than Monitor intrusion, the lower correlation he feels could be due simply to "noise" (Oller 1978). "Noise" could include such factors as a greater opportunity for cheating, the possibility of fatigue, previous exposure to the exam, coaching, indifference as a result of knowing the exam didn't constitute part of their grade, or higher scores which could depress the correlation.

Since "noise" might indeed have influenced the second semester ELI results, it was decided to control for each of the variables mentioned and to evaluate Monitor function more accurately by administering two forms of the surrogate test. With alternating administrations, each group of ESL students would be restricted to 25 minutes on one form but not restricted on the other form. While this study will not be completed for several months, the results of a small pilot administration are in. The present AMLEX was recently administered to 16 non-native speakers at Brigham Young University: 7 Spanish speakers, 1 Portuguese, 2 Chinese, 1 Korean, 2 Japanese, and 3 Germans. These 16 ESL students also sat for a 50-minute experimental TOEFL listening examination. Since time did not permit their also sitting for form B of the AMLEX, students were told they would be evaluated on the number of items completed correctly in 25 minutes as well as on their total score; and that they would be permitted to have as long as needed to finish the test after the 25-minute check. Papers were triple scored and the results correlated with performance on the experimental TOEFL. The Pearson product-moment correlation between the AMLEX score at the end of 25 minutes and the experimental TOEFL was .81; but the correlation between these two examinations dropped to .75 when students were permitted to continue working on the AMLEX without a time limit, and the correlation was .76 when papers were corrected for the percentage correct out of those attempted. While the results must be interpreted cautiously because of the small N, they tend to support the notion of Monitor interference as exemplified in Table 2. The differences in the recent pilot study, however, are not nearly as dramatic as that between the two ELI correlations, but then conditions were not identical either. In brief, the data reveal that time restrictions are necessary in conducting an alternate modality listening test, although the exact magnitude of correlation differences between timed and untimed tests has not yet been determined.

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2 This consists of experimental listening items prepared by TOEFL for evaluation and possible later incorporation in the official TOEFL instrument.
High correlations between the surrogate test and a variety of measures such as listening comprehension, grammar, and total scores on a proficiency battery recall Oller's observation that "when such vastly different tests consistently intercorrelate at the 0.85 level or better ... we may reasonably conclude that they are tapping an underlying competence" (Oller and Streiff 1975:33). Thus while the alternate modality listening test is obviously not measuring such skills as proficiency in processing phonological input, it is apparently tapping language skills which undergird listening.

CONCLUSIONS AND RECOMMENDATIONS

Results of the alternate-modality experiment at the American University in Cairo support the hypothesis that printed listening-test cues utilizing an integrative conversational format can substitute for direct tests of listening. But for them to be fully effective, strict time limits must be imposed. Since the surrogate listening test is similar in form to various commercial aural comprehension tests, it appears likely that listening tests such as the Michigan and CELT could produce similar results in a printed modality with timed administration. Findings seem to corroborate Monitor theory; a timed test with a communicative focus diminishes or eliminates Monitor activity.

Certain cautions, however, should be considered. All findings have been interpreted in terms of experimental groups. Individual variation has not been examined. Moreover, the students utilized in the study tend to have reasonably equivalent proficiency in listening and reading. There is a good possibility, then, that an individual whose skill in one mode far surpasses his skill in another mode may not be properly evaluated by a surrogate test. Equally important is the possibility of a negative backwash effect on instruction. If used to replace a direct measure, a surrogate might well result in a decreased emphasis on oral activities. But if used where no formal oral evaluation had previously been made, it could provide useful information about listening skills, and it might serve as a mild catalyst for additional attention to listening comprehension. Ideally it would complement a productive measure such as a brief oral interview.

Experimental research is now needed to assess individual variation on the surrogate as well as the full effect of timed versus untimed administration. Further evaluation would be useful, too, on implications for Krashen's monitor theory that have surfaced in this research. Finally, other formats, such as timed cloze, need to be evaluated in order to determine the most powerful model for alternate modality testing.
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LINGUISTICS AND THE TRUE BELIEVERS

Melvin J. Luthy

The producers of the movie Star Wars exploited an inherent need in each of us—the need to believe, if only for a moment, that things we knew were fantasies could actually happen. And as though our natural desire for momentary belief were not enough to hold us, the writer reinforced that desire by sprinkling in a little theology with the phrase, "may the force be with you." We recognized that the movie was fiction, but we allowed ourselves to be swept along into a world of fantasy reminiscent to many of us of Buck Rogers adventures, but entirely new and refreshing to the post-Vietnam war generation.

Star Wars is now history, but the need to believe, which preceded it, still persists. And we continue to believe in many things which, like Star Wars, are more fantasy than reality, but which are not packaged into neat one-hour-and-forty-five minute presentations. If they were packaged that way, it would be easy to keep our thinking straight, but they are not, so we do not always succeed in separating reality from fantasy. In linguistics, our desire to believe, often coupled with either discontent, ignorance and/or arrogance sometimes leads us into narrow, indefensible patterns of belief that could earn for us the dubious title of "linguistic true believers," a title no one really wants, because it connotes blind, unthinking acceptance of unproven ideas. Although we like to think that we have a clear view of the issues, and that our causes are just, there is probably a little of the true believer in each of us.

Over the past years I have been subconsciously gathering data on linguists and would-be linguists as true believers, so one day I decided to do a structural analysis of my data. As I analyzed my linguistic true believer-etics, I decided I could justify an inventory of four true believer-emes. I would like to describe the salient features of each, make some diachronic observations, and comment briefly on their synchronic distributions.

The first true believer-eme is the mass movement true believer, the person who ardently gives allegiance to the prevailing trend, even though he may not really understand it. He believes that others wiser than he do understand, and that's good enough for him. No self-respecting linguist would confess to being a true believer in this sense, although in the judgment of others he may be one. The second type of true believer is the ivory tower true believer. He is convinced that what he is doing is the truth, and he
can't understand why others don't see things the way he does. The third type is the moral value true believer. He equates linguistic stability with national or individual morality. The fourth type is the smug relativist true believer. He is characterized by an aloof vanity, for he sees the foibles of all the rest, and considers himself above them all. My following remarks then will touch upon each of these: the mass movement true believer, the ivory tower true believer, the moral value true believer and the smug relativist true believer.

THE MASS MOVEMENT TRUE BELIEVER

The mass movement true believer has been the most obvious and wide-spread of them all in recent years, so my analysis is more heavily weighted with data regarding him. This person is seen not only in political revolutions, but also in what has appropriately been called the "linguistics revolution," referring to the challenge and meteoric rise of transformational-generative grammar in the 1960's. Everything associated with the linguistics revolution fits snugly into a model for describing social or political revolutions--the social conditions, the leader, the leader's lieutenants, and the true believers who followed.

With respect to social conditions we must recognize two primary factors. First, in the fifties there was a growing discontent with rigid Bloomfieldian structuralism, and many linguists were pursuing alternative models of description. Teachers were finding that students were not excited about memorizing Fries' sentence patterns, and language labs were becoming remedies for insomnia. In the midst of this discontent, American linguists and language educators received the greatest windfall of support that they had ever had (or probably ever will have) when the Soviets successfully launched their first Sputnik. That single event sent millions of dollars cascading into language programs, scholarships, and linguistic research. To add fuel to the fire, elsewhere in academia, mathematicians were "selling" the "new math," and the would-be true believers were asking, "How about the new grammar--the new English?" Social conditions were right for revolution.

Eric Hoffer, who coined the expression "true believer," comments on the need for right social conditions:

No matter how vital we think the role of leadership is in the rise of a mass movement, there is no doubt that the leader cannot create the conditions which make the rise of the movement possible. He cannot conjure a movement out of the void. There has to be an eagerness to follow and obey, and an intense dissatisfaction with
things as they are, before movement and leader can make their appearance. When conditions are not ripe, the potential leader, no matter how gifted, and his holy cause how potent, remains without a following. ¹

The conditions were clearly right for the leader of the linguistics revolution to emerge. But not any leader would do. Hoffer describes the kind of leader necessary for an effective mass movement:

The most decisive [qualities] for the effectiveness of a mass movement leader seem to be audacity, fanatical faith in a holy cause, an awareness of the importance of a close-knit collectivity, and above all, the ability to evoke a fervent devotion in a group of able lieutenants. (p. 109)

Need I say more about Chomsky's qualifications to be leader of the revolution. The audacity, fanaticism, and close-knit collectivity of Chomsky and his early colleagues remains unequalled in the history of American linguistics.

The meeting of right social conditions with right leader caused a national revolution. Within a short time there were federally funded workshops nationwide for language teachers to learn the new theory. Teachers wanted to believe, even though they didn't understand. They were sure that the little they did understand would be sufficient to guarantee the success of the much they didn't understand. They bought textbooks by the gross for their schools because the books had a "linguistic" orientation. They had a kind of naive belief that the new grammar possessed panacean powers, that it would solve their problems in teaching English structure and even English composition. The true believing grew so strong in such a short period of time that even explicit warnings and repeated disclaimers from the leader went unheeded. Surely, teachers, and many other linguists, seemed to reason, this will be a better way. But it did not take too long for the faith of most believers to be shaken. Soon the books were left on the shelves to gather dust, and teachers stopped attending summer institutes and night classes to learn the latest diluted rules from MIT.

Hoffer's description of the mass movement true believer accurately describes the early true believer in transformational grammar:

It is the true believer's ability to shut his eyes and stop his ears to facts that do not deserve to be either seen or heard which is the source of his unequaled fortitude and constancy; he cannot be frightened by danger or disheartened by obstacle nor baffled by contradiction because he denies their existence. Strength of faith, as Bergson pointed out, manifests itself not in moving mountains but in not seeing mountains to move. It is the certitude of his infallible doctrine that renders the true believer impervious to the uncertainties, surprises and unpleasant realities of the world around him. Thus the effectiveness of a doctrine should not be judged by its profundity, sublimity or the validity of the truths it embodies, but by how thoroughly it insulates the individual from his self and the world as it is . . . It is obvious, therefore, that in order to be effective a doctrine must not be understood, but has to be believed in. We can be absolutely certain only about things we do not understand. (pp. 78, 79)

Before leaving the mass movement true believer, I would like to share with you a final quotation from Hoffer. Although he writes of political mass movements, to me the following paragraph epitomizes the atmosphere in some linguistic conferences in the 1960's. He continues:

We usually strive to reveal in others the blemishes we hide in ourselves. Thus when the frustrated congregate in a mass movement, the air is heavy-laden with suspicion. There is prying and spying, tense watching and tense awareness of being watched. The surprising thing is that this pathological mistrust within the ranks leads not to dissension but to strict conformity. Knowing themselves continually watched, the faithful strive to escape suspicion by adhering zealously to prescribed behavior and opinion. Strict orthodoxy is as much the result of mutual suspicion as of ardent faith. (p. 121)

So much for the mass movement true believer.

THE IVORY TOWER TRUE BELIEVER

The ivory tower true believer takes pride in not being one of the sheep following the mass movement. He may be a linguist, a teacher, a methodologist or a graduate student. Whoever he is, he feels he can think for himself. If conditions are right, and if he has sufficient audacity, and ability to evoke fervent devotion in a group of able lieutenants, he could be the leader of a mass movement, since he already has his fanatical faith. Seldom, however, are con-
ditions right, so he remains in his ivory tower, convinced of the rightness of his own way and unnoticed by almost everyone except those with whom he has occasional debates. He may or may not have a leader to follow, but in either case he is sure of his own ideas. When others don't seem to understand or agree, that's their problem; they have either been deluded with notions of the mass movement, or have their own axes to grind.

He doesn't want to accept the notion that all linguistic models are faulty metaphors, each drawing attention to different aspects of language, but obscuring other aspects. For him, such a notion applies to all other models except the one of his persuasion. At times he may be found associated with the mass movement, but most often he stands relatively alone as the mass movement rushes by; but he gains strength from this, for although he is only one, his heart is pure.

THE MORAL VALUE TRUE BELIEVER

The third type of true believer is the moral value true believer. He is the author of expressions such as, "If English was good enough for Jesus it is good enough for me." He is often the ardent nationalist concerned with preserving the integrity of his nation by purging its language of foreignisms. If not a nationalist, he may be the son or daughter of parents who were preoccupied with correctness, and made him feel that "ungrammatical" usage was an indication of moral decay. This type of true believer finds that abandoning any of the usages he holds dear is a very painful experience—one that evokes feelings of indignation and regret similar to those evoked by tearing down historic landmarks, or burning grandma's diaries. To many, such abandonment would be an admission that they had given in to a permissive society, rejected the values of the past, and assented to a softening of moral fiber; in fact, for some it seems it would be easier to give up a son or daughter than a distinction between shall and will. It is surprising how high emotions run with this true believer, but I can personally empathize with him. I am not ready to give up the useful distinction between infer and imply. Somehow losing that distinction seems like losing mental rigor, and accepting a softening or weakening of analytical skill. The distinction is a valued friend, but perhaps one day I will have to give it up, but I hope not.

We may be tempted to point an accusing finger at the English language teacher as a moral value true believer. Of course some of us are, but we must appreciate the fine line that the teacher must walk. He has a responsibility to exert a conservative influence over linguistic change in the
name of order, to insure that although one generation's slang may be unintelligible to the next, the standard level of language does not change so rapidly that one generation's wisdom is lost on the next. Of course, when the time arrives that new usages clearly overshadow the old, they must be given up. Finally, to be an unwavering moral value true believer in language usage is to find one's self in a very awkward position, because the past is replete with linguistic change. Thus at the outset one is already lost in an abyss of linguistic immorality.

THE RELATIVIST TRUE BELIEVER

The fourth type of true believer, the relativist true believer, is, as his name suggests, a kind of paradox. He is characterized by an aloof vanity; he is above all the other believers. He can see the foolishness of their narrow commitments and their grave pronouncements. Since no one has the final answers, he sees no sense in committing himself to any belief; and he considers his indecision, or non-committal attitude, as evidence for his scholarship. Too often it is a substitute for scholarship. He could never be the leader of a mass movement, for he has no firm belief in a cause. He could never be a mass movement true believer, for he has no desire for commitment. He could never be an ivory tower true believer, for he has no self-confidence. He could never be a moral value true believer, for he has no constant values. He is the most insidious type, for his smug cynicism masquerades in a cloak of academic wisdom, and he cheats himself and others by giving up, or causing others to give up, in the struggle for truth, since "there are really no final answers."

CONCLUSION

Perhaps no one of us fully fits any of these descriptions, but no one of us completely escapes them all, either. It is the extremes in each case which must be avoided. Like the mass movement true believer, we need hope and faith in the work of those we admire, but it should never become blind fanaticism. Like the ivory tower true believer, we need a set of firm principles to guide our professional lives, but we need to recognize the difference between moral principles and arbitrary linguistic change. And, like the smug relativist true believer, we need skepticism, but we must avoid the vanity of cynicism.

Each of these four poles of true believing exerts its tension on us, trying to win our allegiance. We would all do well to keep the tensions taut on all four, and consider the consequences of giving our all to any one—and I truly believe it.
The knowledge that standards in English are often arbitrary does not seem to reduce the stigma attached to "folk" forms such as "them things," "you was," "have went." But standard grammar is an elusive, indeed in some ways illusory ideal. Thomas Creswell has shown that dictionaries have surprisingly little common ground in their precepts and prescriptions regarding usage (Usage in Dictionaries and Dictionaries or Usage, unpublished University of Chicago dissertation, 1974). His study concludes that, for the 228 items treated in the usage notes of The American Heritage Dictionary, no correlation can be made between the judgments of its usage panel and the treatment of these items in nine other famous dictionaries. The historical reasons why English so singularly defies the efforts of purists can be demonstrated by variant forms: An anomaly that most manifestly and manifoldly tells the protean story of English is that of the verbs made upon the base form wake (past tense variants waked, waked up, wakened, wakened up, woke, woke up, awoke, awaked, awakened).

The forms of (a)wake(n) are remarkable not only for their variety but for the fact that almost all of them seem to be within the bounds of standard grammar. Several questions come to mind: 1) why did so many forms arise, 2) how much have they been differentiated in meaning, 3) what patterns of social and geographical distribution exist for these forms. In dealing with the third question I have drawn upon data, as yet unpublished, from the files of the Linguistic Atlas of the North Central States and of the Dictionary of American Regional English.

Part of the reason for the existence of such a variety of forms for the same meaning is easy to explain: the hodgepodge has existed from the earliest times in our language. In Old English there were eight relevant infinitive forms for these verbs, owing to strong and weak variants, and forms with the prefixes on- or a-.

Overall, three of the variants were strong verbs and five were weak verbs:

\[ \text{waked, waked up, wakened, wakened up, woke, woke up, awoke, awaked, awakened} \]

Part 1:

\[ \text{The a- prefix is a reduced equivalent of the on- prefix.} \]
1) *wacan, pas. woc, p.p. wacen (usu. intrans.): waken, be born, spring to life

2) waecnan (waecnian), -ede or ode (intr): waken, be born, spring to life

3) wacian, -ode (intr. & tr.): keep watch, wake

4) awacan, pas. awoc, p.p. awacen (intr.): awake from sleep; come into being

5) awacian, -ode (intr.): awake from sleep

6) awaecnan (awacnian; awaecnian), -ode (intr.): awaken, revive, originate

7) onwacan, pas. onwoc, p.p. onwacen = awacan

8) onwaecnan (onwaecnian; onwecnian), -ede or ode (intr.): awake, arise, be born or derived (= awaecnan)

Cf. weccan, pas. wehte (trans.): rouse, stir, excite, wake up

(Definitions summarized and collated from the Bosworth-Toller Anglo-Saxon Dictionary and Oxford English Dictionary (OED)).

All these forms were at first ordinarily intransitive, the transitive use being weccan. Eventually, the intransitive forms were adapted to transitive use, tending to displace weccan. The only clear distinction in meaning among these intransitive Old English variants seems to be that of the weak verb wacian, "to keep watch." The other verbs seem to be interchangeable, in the various closely connected literal or metaphorical meanings "to awake from sleep, come into being, be born, be derived, spring to life, revive, originate, arise," except that the forms with n infix, from which derives ModE (a)wake(n), are chiefly metaphorical.2

In Middle English, the verbs became levelled to four main infinitive forms that are the basis of modern disparate usage: 1) awaken, 2) awaknen, 3) wake, 4) waken. The final -n forms waken and awake in modern English are due to the presence of -n in the root of the Old English weak forms waecnan, awaecnan, onwaecnan. The wake verbs are almost the only ones to have -n forms and n-less forms continuing to exist side by side in contemporary English. Modern English verbs with the -n suffix are mostly new formations on a noun or adjective base, e.g., lengthen, strengthen, lighten, tighten, darken, flatten. In Middle English, the strong and weak variants in the finite forms seem to have been used at random interchangeably, and all four base forms were used both transitively and intransitively. Already in Middle English, however, the final -n form waken was losing ground to wake in the main meaning, "to arise from sleep." In Middle English times, the form wake became the exclusive verb to mean "keep watch or vigil" and remains so today. This seems to be the chief differentiation in meaning among the forms of Middle English, though a collation of definitions and examples from the OED and the Middle English Dictionary (H. Durath and S. Kuhn, Univeristy of Michigan Press, 1956), shows the following breakdown:

1) awake, pas. awoke or awakened, p.p. awaken, awake(n)
   a) to awake from sleep or lethargy (intr.)
   b) to watch (intr.)
   c) to happen, originate (intr.)
   d) to cause (trans.)
   e) to wake up (trans.)
   f) to arouse, excite (trans.)
   g) to attack (trans.)

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1) Exceptions to this seem for the most part to be archaic, e.g., hark and harken.

2) Note the sameness in context in the following examples from the Middle English Dictionary:
   c.1175 "On maregen ... he awoc," HRoed 2/15. c.1230 "tha he awakede," Ancr. 64a. "Theseus of his sleep awakened," Ch., KnT. A2523. "His spirit God restored ... and he awook," Ch., Sum.T. D1703. 1375 "Softili he a-waked," WPal. 677. c.1380 "Florippe a-wok and cryde an haste," Firumb. (1)2432. 1470 "The Kynge awoke and myssed his scauberde," Malory, Wks, 151/1. 1500 "He a-wakyd and meruaylede of this vision," Spec. Sacer. 197/18. The employment of the n infix form for figurative uses occurs in Middle English as in Old English, though perhaps not so pronounced as in Old English. More than half of the citations for awakened in the MED are in a figurative sense.
2) awak(e)n (OE awaecn(i)an and onwaecn(i)an), pas. awak(e)ned, or awakenen
   a) awake from sleep (intr.)
   b) awake (trans.)
   c) come to exist (intr.)
   d) cause (trans.)

3) wake, pas. woke, waked, p.p. waken, woken, woke, waked
   a. become awake (intr.)
   b) remain awake (intr.)
   c) keep watch (intr.)
   d) guard (trans.)
   e) keep a vigil or prayer, or a wake over a corpse (intr.)
   f) study late (intr.)
   g) wake someone up (trans.)

4) waken, pas. wakened, p.p. wakened
   a) become awake (intr.)
   b) become stirred up or active (intr.)
   c) rouse from sleep (trans.)

For some reason, the strong forms woke and awoke fell into disuse during the fifteenth and sixteenth centuries. Thus today we say /wok/ instead of /wuk/, which would be the pronunciation now if the strong forms had been used during the centuries of the Great Vowel Shift. Even well into the seventeenth century these strong forms were eschewed in literary English, as, for example, in Shakespeare and Milton. But woke and awoke did become reintroduced in the seventeenth century on the pattern of break--broke. The other significant development in the early modern period was the addition of the particle up, attested in the OED as early as 1535 (Coverdale, "Wake up, ye dronckards," co. King James

5 Shakespeare has wak'd, waken'd, wakened, but not woke or awoke (Harvard Concordance to Shakespeare, Harvard University Press, 1973). The King James Bible, besides awaked (eight instances) has the prefixed form awoke in the past tense (eight instances), but only waked (one instance) and wakened (two instances) in the unprefixed past tense and past participle (James Strong, An Exhaustive Concordance of the Bible, New York, 1890). Milton has waked, awaked, and awakened, not woke, awoke, or wakened (John Bradshaw, A Concordance to the Poetical Works of John Milton, Hamden, Conn.: Archon Books, 1965).
Bible, "Awake, ye drunkards," Joel 1.5), and the form wake up has gained in frequency ever since.

We now come to consider the state of these verbs in English today. It is to be either lamented or celebrated that English has not achieved the neatness and precision of the use of these forms that is manifest in modern German: the transitive verb in German is wecken, the intransitive aufwachen meaning "full wakefulness," the common term for ordinary waking up being wach werden; special senses exist as follows: metaphorical use--erwecken; literary word--erwachen; waken from the dead--auferwechen (tr.), auferwachen (intr.). By contrast, in English the forms have been more or less in free variation historically, and no less so at present. Dictionaries and dictionaries of usage tend to feel uncomfortable about this situation. In A Dictionary of Contemporary American Usage, Bergen and Cornilia Evans comment as follows:

The past tense is woke, waked, or wakened. The participle is waked, wakened, woke, or woken. Each of these forms may have the prefix a, as in awake, awaken, awoke, and so on, or it may form a compound verb with up, as in wake up, woke up, wakened up, and so on. This gives us twenty-seven forms for the principal parts of this verb, where ordinarily two forms are enough, as in talk, talked. This is certainly more words than we need for such a simple act.


7Cf. Early Modern English (King James Bible), Judges 16.14, "And he awaked out of his sleep." Judges 16.20, "And he awoke out of his sleep." The figurative sense of the n infix verbs that was seen in Old English and to a degree in Middle English is nicely illustrated (though in past participle rather than past tense) in one verse: "And the angel that talked with me came again, and waked me, as a man that is wakened out of his sleep." Zech. 1.4. As to the contemporary English, the citations in Webster's Third New International for the item awaken imply that its usual application is for figurative senses. Six of the seven citations illustrating the use of the word are in a figurative sense. The figurative function of the unprefixed form waken, however, is not so pronounced according to the evidence of the citations under waken.
The only distinction they make as to usage, however, is a mild proscription concerning the past participles:

The participles that have a vowel o, as in had woke, has awoken, and so on, are not considered standard in the United States but are still acceptable in Great Britain. Aside from this all the forms are equally acceptable and which one is used is entirely a matter of individual taste.

Fowler (A Dictionary of Modern English Usage) devotes half a page to making subtle distinctions, for example, "Awake & awaken are usually preferred . . . in figurative senses," but in general acknowledges that "Distinction between the forms is difficult." The American Heritage Dictionary, however, makes specific, ostensibly descriptive but intuitive sounding assertions:

The verbs wake, waken, awake, and awaken are alike in meaning but differentiated in usage. Each has transitive and intransitive senses, but awake is used largely intransitively and waken transitively. In the passive voice, awoken and waken are the more prevalent: He awoke to the danger; his suspicions were awakened. Wake is frequently used with up; the others do not take a preposition. The preferred past participle of awake is awaked, not awoke: He had awaked several times earlier in the night.

Other works such as The Random House Dictionary portray a sense of the synonymity of the variants. Although providing separate entries for the variants, the RHD defines them in terms of each other: awake means "to wake up"; waken means "to awake, [or] waken," wake means "to awake, awaken, [or] waken," waken means "to wake, awake, [or] waken." And one is hard put to credit the differentiation in the specific definitions of these words in the RHD, e.g., "to rouse to action," (awake) "to rouse from sleep," (waken) "to rouse from inactivity," (wake).

With regard to grammaticality, even the more exotic of these forms seem to have respectability in some areas. Whereas participial forms such as in have broke, though standard or literary in the eighteenth century (cf. Gray's Elegy, "Their furrow oft the stubborn glebe has broke") are no longer in reputable use, have woke is within the realm of Standard British English, and have woken, though perhaps tainted to American ears, is good enough for the Times Literary Supplement (cited in the OED). The fact that the various aberrant forms are accepted into standard English--British and American--probably owes to the circumstance that no one of these forms is stereotypical of folk usage,
becoming a badge of illiteracy or lack of education. So, for example, though the historically prominent weak variants waked, etc., are now somewhat rural and archaic, and forms such as wakened have become in England quite localized, they are not thought of as substandard.

In the United States a very mixed, not to say mixed up situation obtains regionally and socially. The files of the Linguistic Atlas of the North Central States, for example, list twelve variants in the past tense, in the context of the frame "I woke up early," viz. woke, woke up, awoke, waked, waked up, awakened, wakened up, awakened, got awake, woked, woked up, awoken. Only the last two of these are so bizarre as to be readily called nonstandard or uneducated usages. The Handbook of the Linguistic Geography of New England lists a mere nine variants: awaked, awakened, awoke, waked, waked up, wakened, woke, woke up, woken. In the east, as elsewhere both in England and the U.S., the common form is woke up. The weak form waked is found mostly in New England and the South. A fifth of the older informants in eastern New England used waked, only one-eighth of the younger informants. In North Carolina, however, waked appeared in fully two-thirds of the cultured informants. Rarer forms including waked, wakened, awakened, and also the prefixed form awoke are all found in cultured informants, and we do not call these relatively uncommon variants nonstandard.

In a synopsis of the grammatical data in the Linguistic Atlas of the Upper Midwest, Harold Allen indicates that in general grammatical variation decreases as one moves west, at least as far as the Upper Midwest is concerned:


9 At the University of Chicago, and being edited for publication. The "North Central States" are Wisconsin, Michigan, Illinois, Indiana, Ohio, Kentucky, and the Canadian province of Ontario.


1978 Languages and Linguistics Symposium
Some of the older minor [verb form] variants contributing to regional subdialect differences along the Atlantic coast failed to survive during the western migration; others persist so weakly as to be inadequate criterions for geographical patterns.12

This is illustrated by the fact that in the Upper Midwest "Only two forms not school-approved have clearly gained in frequency, drank ppl. and dove pret." (p. 84). The possibilities of language variation begin infinite, however, a Utopian grammatical uniformity is, clearly, not in sight. Despite Allen's observation that "the Upper Midwest has fewer [grammatical variations] than the North Central States," the picture is not a simple one. In the forms selected for the present study, we find problems and developments that indicate it is hard to predict what will happen in certain features of grammar from one time and place to another.

The files for the North Central States, for example, show somewhat different patterns for the verbs in question from what one might guess on the basis of the Atlas materials for the East Coast and the Upper Midwest.13 Whereas, to take the commonest form, the incidence of the predominant woke up is inversely proportional to age and education in the Upper Midwest, this relationship does not exist in the North Central States.14 Educated speakers in the North Central States have a higher rate of conformity than those in the Upper Midwest. Using the criterion of age alone, two-thirds of the younger speakers (Type B according to the Atlas classification) use woke up in the NCS, only slightly higher than the rate in older speakers (60 percent in Type


13 Much of the data on verb forms for the North Central States is presented by Virginia McDavid, Verb Forms of the North Central States and Upper Midwest, University of Minnesota dissertation, 1956. The data that I am using is my first-hand examination of the updated Atlas files themselves, for a breakdown of the wake verbs in greater analytical detail.

14 The relative incidence of woke up is about 65 percent in Type I, about 60 percent in Type II, but almost 70 percent in Type III.
A), which is scant evidence of a trend toward levelling. The only form that shows much difference in incidence with respect to age is that of waked up, an uncommon form in any case, showing up in 10 percent of older speakers and only 3 percent of younger speakers. These latter statistics do accord with the information from the East Coast that the waked forms are recessive.

Even these recessive forms have peculiar staying power. The eight to ten major variants of the wake verbs following their erratic paths even within the bounds of standard grammar. Thus, while waked and waked up, being historically archaic forms, have the expected higher incidence in Type I speakers, other more or less common variants persist in low profile among various speaker types. The prefixed weak form awakened has more than double the incidence in NCS Type II and III speakers as in Type I. From Old English times up through Fowler we recall that this form is somewhat literary or metaphorical; it is indeed rarefied in its usage, at the rate of 2 percent incidence in Type I speakers, up to a healthier 5 percent in Types II and III in NCS. Concerning strong form variants other than the common woke up, the naked form woke has nearly double the incidence in Type II (13 percent) compared to Type I (7 percent), while apparently being eschewed by the more learned (4 percent incidence, Type III). The prefixed but unparticled awoke is just slightly more popular in Types II and III (10 percent) vs. Type I (7 percent) in the NCS.

The up adjunct seems to perform no essential semantic function in these verbs. It does not change the essential meaning of the base, except as it would distinguish the common meaning of the verb from the specialized meaning "to keep a vigil." The popularity of the up forms is perhaps an upshot of the modern addition of up to any number of common verbs. Yet whereas up often not only adapts its verb to a new sense but imparts a colloquial touch to the modified form, as in touch up, give up, mess up, ring up, the wake verbs are essentially unaffected in meaning by up, the modification being one of idiom rather than of tone or meaning. The variants without up, since more uncommon in contemporary English, probably have a formal effect in speakers who use or hear more than one form. In the NCS, usually the uncommon variant forms were given together with a more common form, e.g., "woke up," or "wakened" (a southeastern Wisconsin informant), "awoke," or "woke," or "awakened" (a south central Michigan informant). Forms with up dominated three to one in both Type I and Type III, confirming the long establishment of these forms, and their fully standard status among educated speakers. In Type II speakers the incidence of up forms was somewhat less but still high--two to one.

1978 Languages and Linguistics Symposium
Geographically, in the NCS only a couple of these forms show a ready pattern. The recessive weak forms (waked, waked up, awaked) appear in rural areas, heaviest in Kentucky, southern Indiana, and western Ohio, though scattered instances occur throughout the NCS in the urban areas of the Type III informants. For items that are scattered and sporadic, as these forms are, it is particularly desirable to get as much data over as wide an area as possible. An overall view for the geographical distribution of the wake verbs can be gotten from the material in the files for the Dictionary of American Regional English (DARE) located at the University of Wisconsin and currently being edited for publication. Without respect to criteria of age or educational background, though such information is also available for analysis, the relative frequency of the various forms of these verbs nationwide is roughly what it is regionally in the NCS: two-thirds incidence of woke up, and a range of from 15 to 5 percent incidence, in descending order, for awoke, awakened, woke, and waked up. The incidence of wakened is 5 percent in the NCS files and 2 percent in the DARE files (nationwide). At one percent or less are waked, awaked, and wakened up. One form, went awake, historically from the Pennsylvania Dutch area, nationwide (DARE data) appears in only two states other than Pennsylvania (one informant each in Ohio and Virginia), confirming the localization of this form that had been indicated by the data for the various regional linguistic atlases. The form waked up, which the Atlas materials had shown to be recessive in New England though somewhat fashionable in the South, shows up in a broad band throughout the South into Texas, but hardly at all in New England among DARE informants. A particular one of these variants thus will gain ground in one region while losing ground in another. Some of the less common forms are shown to be thinly but widely and fairly even dispersed, rather than withering away in isolated pockets. Rarefied forms like awakened and wakened have become nonregionally established nationwide in centers of population. Most of the regional patterns are fairly large. The strong forms woke and awoke, excluding woke up, are distributed throughout the North and East but almost absent in much of the inland South and the far West. West of the Mississippi, even the DARE data provide only scantly evidence for forms that are uncommon, as some of these variants are, for DARE used a rather small handful of informants in the less populous Rocky Mountain states (e.g., nine in Nevada, five in Montana), and thus rare or scattered variants will not be represented in these areas.

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15 Atwood, p. 25.
Brief conclusions are in order. One is that standard grammar can tolerate more variation than is commonly believed. There forms demonstrate that variants of themselves need not be stigmatized: in some areas the majority form woke up is more pervasive among informants of lower education. The variants of the wake verbs have arisen for explicable historical reasons, namely, the collapsing and proliferating of several related verbs in Old English—prefixed and unprefixed forms, strong and weak forms. That such a glorious profusion of alternate forms should exist for a given lexical idea should not surprise or annoy us. There are several merits that we could ascribe to the persistence of these many forms, as, for example, that they remind us of the historical richness of our tongue, of the fine choices of rhythm and idiom at our disposal in any given context (a potential for subtle differentiation that is "not likely to be fully carried out," it has been said), and of the diversity of our language in various areas and social settings. But in a more fundamental sense, for the sake of their variety, we need all these forms. That is why they do exist. These forms vividly demonstrate that standard English grammar is not and can not be completely neat and tidy, nor should we want it to be so.
AN INTRODUCTION TO COMMUNICATION THEORY:
A DESCRIPTION OF THE TEACHING ACT

Mary Ann Christison

Norbert Weiner's now classic work entitled *The Human Use of Human Beings: Cybernetics and Society* reveals the thesis that society can only be understood through a study of the messages and the communication facilities which belong to it (Weiner, 1954). The study of these communication facilities is assuming an important role in the society of the world. We are just beginning to realize the significance of Weiner's thesis. It is not surprising that the science of communication now includes many diverse fields of interest such as mathematics, sociology, psychology, linguistics, education and foreign language instruction, to name only a few. As teachers, supervisors, employers and students we are always communicating and discussing lessons, texts, methods of instruction, tests, and various schools of language teaching. We may, however, be characterized as the four people in a Japanese play entitled Rashomon -- we give contradictory and equivocal accounts of the same events (Fanselow, 1977). A new conceptual framework can help us avoid this contradiction. The purpose of this paper is to introduce you to a more precise and rational method for describing communication in the classroom.

The primary reason for contradiction in describing communication in the classroom is that no technical language exists to designate the teaching behavior in second language learning settings. The vocabulary we do have such as pace, drill, reinforcement and audio-lingual are ill-defined and inconsistently used. Without a common unit of analysis, each viewer is bound to see events through his own perceptions and preconceived notions. What we need is a technical language to describe the teaching act and a conceptual framework for classifying, creating and evaluating communication in a range of settings.

The basic idea of classifying the communication people send and receive in both teaching and non-teaching situations eventually developed into the field of Cybernetics and Communication Theory. A closer look at these fields will provide us with a more rationale and precise method of describing communication in the class.

The term cybernetics refers to the philosophy which insists that from the point of view of communication the human organism is not essentially different from a machine. It emphasizes the resemblances between living organisms and
man-constructed machinery and points out that even though the components differ, in theory their operation is the same. They both act as an intermediate stage in relation to the signal. Used in the programming of communication, cybernetics becomes a precise and well-structured language which seems very basic to the description of the teaching act.

The theory of cybernetics is concerned with the problem of defining the information contained in a message so as to be able to recognize the unit whenever it occurs. Using this theory, we can pick out the most general structural relationships or we can deal with an abstract language of structural relationships that exist only as we define them—such as morphemes, phonemes and syllables. Communication, in this sense, is regarded as a physically measurable quantity only.

Thus far, this strictly mathematical approach to the description of language and more pointedly the eventual description of the teaching act, seems at first glance a useful and accurate tool. It is, of course, extremely useful and accurate in the proper context, but there is no manmade or natural communication system which does not have in it the potentialities for error. Cybernetics and Communication Theory treat information as a physically measurable quantity only. Communication Theory is more concerned with the technical problem of transmitting signals accurately rather than the semantic problem. It cannot distinguish between information of great importance and a piece of news of little value for the person who receives it, nor does it admit the possibility of foreign elements—a cough or an illegible handwriting. It can not determine, either, whether or not the message is understood. Communication in this sense does not deal with meaning or with message content. This theory, nevertheless, is important because it is through a rudimentary extension of this theory—the defining of information contained in the message so as to recognize it whenever it occurs, that we find the tools necessary for the description of the teaching act.

We are all aware of the technical language which exists for a second language—such as phonology, morphology, syntax, etc. But, as stated previously, no technical language exists to designate the teaching behavior. Such words as drill, reinforcement, mechanical, audio-lingual, and communicate are used inconsistently. These are all subject to personal interpretations and points of view and tend to become little more than the advocacy of one particular theory. Although Communication Theory in its purely mathematical sense fails to account for semantic variance, it seems that the present technical language used to describe teaching behavior allows for far too much. There needs to
be a technical language for the teaching act equal to the technical language used to teach content.

In TESOL Quarterly, March 1977, John Fanselow published an article entitled, "Beyond Rashomon -- Conceptualizing and Describing the Teaching Act." This article is concerned with providing a more precise description of the teaching act. The following information is an overview and analysis of his research which provides us with a technical language for the teaching act. An additional study was also conducted using Fanselow's proposed technical language. The results of this particular study will also be discussed.

According to Fanselow, there are five characteristics of communication within the language classroom. These have been defined and given the following technical terms: source, pedagogical purpose, medium, use and content. (Figure A)

Figure A

Five Characteristics of Communication in Settings*

1. Who communicates? (source)
   - teacher (t)
   - individual student (st)
   - informant (i)
   - textbook (b)
   - group of students (g)
   - class (c)
   - visitor (v)

2. What is the pedagogical purpose?**
   - structure (str)
   - solicit (sol)
   - respond (res)
   - react (rea)
   - bearing (bea)

3. What mediums used to communicate content?
   - are linguistic (l)
   - non-linguistic (nl)
   - para-linguistic (pl)


**The first four pedagogical purposes are from Bellack.
4. How are the mediums used? 
   attend (a) 
   characterize (c) 
   present (p) 
   relate (r) 
   re-present (rp) 

5. What areas of content are communicated? 
   language system (ls) 
   life (l) 
   procedure (pr) 
   subject matter (sm) 

A more thorough description of the five characteristics of communication in settings can be found in the TESOL Quarterly mentioned above.

The first of these characteristics, "source", is concerned with simply "Who" communicates. In the language teaching situation these could be defined and abbreviated as follows: teacher (t), textbook (tb), informant (i), students (s), group of students (g), and class (c) (Figure A). In a teaching situation, of course, these would vary to include the participants in the communication act. The patterns would change to fit the situation.

The next characteristic mentioned is "pedagogical purpose." There are four pedagogical purposes: structuring, soliciting, responding and reacting (Bellack, 1966). Structuring refers to communications that set the stage for subsequent behavior and exercises or self-directed activities—such as reading silently or cleaning up the classroom without being told to do so. Communications that set tasks or ask questions are soliciting. Soliciting may be done by the student or by the teacher. Performances of set tasks and answers are responding moves and communications that modify these moves are called reacting. Included here are also communications that are reflexive or not requested. In addition to the four purposes defined by Ballack, Fanselow adds an additional purpose he defines as bearing. Bearing refers to unconscious communication, as the jiggling of one's keys, etc.

The third characteristic is "medium". There are basically three mediums used in communication. These are defined as linguistic, non-linguistic and para-linguistic. Communications expressed through words or written representations of such communications are referred to as linguistic mediums. Communications that are made with instruments or with the body functioning as an instrument are called non-linguistic. Communications such as gestures, movement, and touch are expressions of the body without the vocal cords (e.g., body language) and are called para-linguistic mediums.
The fourth characteristic is entitled "use" and is concerned with how the mediums are used. There are five ways in which the mediums are used. These are defined as follows: attending, characterizing, presenting, relating and re-presenting. Attending is when the medium is not used to communicate content—listening, silent reading, tasting, feeling objects, etc. Characterizing is communicating about content or things. This is distinguished from presenting which is communicating actual content itself. The fourth use of the medium is defined as relating. When we relate communications about content such as making generalizations, making rules, generating new patterns or making inferences, we are using the medium defined as relating. The final use of the medium is called re-presenting. Substituting, transforming, paraphrasing, and combining are all forms of re-presenting: they all communicate content another has just communicated.

The last characteristic of communication Fanselow discusses is concerned with what areas of "content" are communicated. Four basic areas of content are discussed. In the language classroom, any information about the target language which is set apart, tested and practiced is labeled as language. Any formulas such as greetings, reflections, personal feelings, personal information and general knowledge would be examples of communications which are part of real life experiences. These are coded as life. The calling of role in the classroom, disciplining students, giving directions to manipulate language and language teaching procedure and explaining the reasons for particular exercises are all examples of the third category of content labeled procedure. Information other than that which is categorized as language, life and procedure is coded as subject matter. Communicating skills such as knitting, skiing, and playing bridge or survival skills such as how to cash a check or read a rent agreement are examples of content classified as subject matter. In summary, this comprises the last of the five characteristics of communications in the teaching act—source, pedagogical purpose, mediums, uses and content.

Using the above information from Fanselow's research, I conducted a small project in ten different language classrooms. My evaluations were not nearly so detailed as those of Fanselow's (It takes practice to achieve competency using this form), but I felt my study was, nevertheless, valuable.

To begin with, I made a small chart indicating the five characteristics described by Fanselow (Figure B)
Figure B

<table>
<thead>
<tr>
<th></th>
<th>1 SOURCE</th>
<th>2 PURPOSE</th>
<th>3 MEDIUMS</th>
<th>4 USE</th>
<th>5 CONTENT</th>
<th>TOTALS</th>
</tr>
</thead>
</table>

Then I spent some time practicing with the abbreviations I had employed. My first observation proved very successful. Partially, I believe, because my presence was not supervisory in any sense. The teacher and students appeared relaxed. Secondly, the evaluation was more objective. It was not necessary to say, "You need to get your students more involved." If lack of student participation was a problem, column 1 (Figure B), "who communicates" would be heavily coded with "t", indicating teacher, with relatively few "st's", indicating student participation. Teacher dominated activities would also be evident in column 2, "pedagogical purpose," "Structuring" would be heavily coded if the teacher did a lot of explaining of the tasks or activities. In addition, a teacher who initiated most of the classroom activity would dominate the characteristic of communication known as "soliciting." The two characteristics, "structuring and soliciting", were heavily coded as teacher dominated in 8 out of the 10 classrooms observed.

The heavy reliance on the teacher as "communicator" and "user" of the target language should tell us something about the ever present focus on teacher oriented classrooms. Considering the reported success of the various "cults" in our profession which focus on student initiated communication such as Gattegno's Silent Way and Curan's Counseling Learning (C-L) and Community Language Learning (CLL), can we afford to ignore their obvious focus? I say we cannot. We need to continue to develop a more sensitive awareness to the student's actual needs, an awareness which will help us avoid monopolizing the learner space and help us start building communication bridges between teacher and learner and the learners themselves. An instrument such as the one

described here can help us bring this type of classroom com-
munication into the proper focus.

The progress we make in language teaching, as in any
profession, comes from those who have studied their discip-
line and are able to describe it. Like professionals in
other areas, we can also see, the creative and innovative
"confident that the teaching act is no longer a mystery that
defies precise and rational description" (Fanselow, 1977, p.
32).
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ENHANCING INTERCULTURAL COMMUNICATION:
A LANGUETIC MODEL

V. Lynn Tyler

While visiting in the Middle East, an American was invited to dinner at the home of an Arabic friend. As he was leaving, he made a special effort to thank the host and hostess for their hospitality and generosity. But as he talked with them, he realized that his sincere compliments had been misunderstood.

* * * * *

An American supervising a project in the Orient was partially responsible for some real errors made. He called a meeting to discuss the problems and to justify his actions. He wanted to explain how anyone in a similar type situation could have made such a mistake, and hoped to imply that he should not be blamed and asked for suggestions as a follow up. But, during the presentation, he sensed that something he was trying to communicate was unacceptable.

* * * * *

It was an international "let your hair down" type of social -- relaxed. As three or four Americans loaded up on cream and sugar, words were said by the hosts that seemed to offend almost everyone present.

* * * * *

What happened in each of these situations? Ineffectual information? Erroneous motivation?

Many people anticipating an experience, interacting with someone of another culture, expect some challenges in communicating, especially when languages and cultures are very distinct. Unfortunately, many mistakenly assume that problems stem from language differences alone, and that usually they can be resolved by appropriate language training or some type of language-based explanation.

Actually, verbal communication comprises only a portion of the total message that is conveyed, fed back, and reacted to. In the cases reviewed above, the English language might have been used, but without misunderstanding. The situations described all involve a broad spectrum of "communicative indicators." Nonverbal signals (gestures, assumptions, and actual situations, for example) often surround and greatly influence normal language expressions.
To communicate effectively in or with varied cultural constraints, one must take into consideration many factors which often have been overlooked by people whose life experiences differ widely in time, space, and medium of communication.

The intercultural communicator should try to discover pertinent differences and similarities regarding expectations, assumptions, values, and behavior unique to different peoples and should become familiar with factors and conditions which may either inhibit or enhance culturally loaded messages. Such a communicator is most effective when using specific cues to communication which are affected by contextual and environmental factors influencing its participants.

In every intercultural communication context, certain information and motivation 'gaps' must be bridged if communication is to reach its highest potential. These gaps may inhibit messages if they are in the form of "MIS-CUES" (which may be defined as communicative elements that are in some real way—even if assumed to be—offensive, provocative or intolerable), or "MISSED-CUES" (which are unclear, have varied meanings, are meaningless in certain contexts, or are simply "too different"). Mis-cues lead to miscommunication, while missed-cues result in non-communication.

The term "LANGUETICS," has been coined recently to mark the comprehensive study of essential verbal, nonverbal, para-verbal, and other indicators of language-based communication. "Languetics," as a holistic term, comprehends more than linguistics (the scientific study of verbal language: written or spoken), or communication (studies of audiences, modes, and media—for focused purposes), or ethno-behavioral sciences (which study mental, emotional, and physical behavior based on cultural or other influences), as these deal with communication systems and their results. "Languetics" encompasses all essential LANGUAGE MARKERS (or their notable absence) and their CULTURAL INDICATORS, or other elements and influences on or from language—as these are significant in an intercultural setting.

Culture Grammars for specific cultures and Intercultural Grammars are currently being developed to identify "cultural variants," and to help bridge the barriers to intercultural communication that are created by these variants. These Culture and Intercultural Grammars are more than just explanations of syntactic rules of a given language or syntactic differences among the languages of different cultures. They include the essential "languemes" of the culture involved. In other words, they include information about denotative, connotative, referential, idiomatic meanings of important lexical terms, as well as information about nonverbal cues that are essential to communication.
To increase communication efficiency, they are being compiled in thesaurus fashion and will include guidelines for most effective use. The guidelines will include an explanation of how the languetic model introduced in this paper can be used to facilitate the development of actual message components and how it can be used in locating relevant concerns found in Intercultural Grammars.

In order to develop useful Intercultural Grammars, a readily retrievable and practical system of data availability is essential for detecting and then effectively utilizing the pertinent required information. This must include:

1. Data required for the receptor (receiver) of the message, but which is not present in the situation or in the message per se. (That is, it is "between the lines.")
2. Data that is ambiguous for either the originator or receptor of the message.
3. Data that is implied but which must be made explicit in a new cultural context.
4. Data which is already explicit but which may need distinct treatment, because it may be offensive or otherwise potentially not acceptable within a new cultural perspective.

The languetic model of intercultural communication now to be considered is aimed at identifying and defining the basic and essential components and factors involved in intercultural communicative encounters. From numerous attempts of the Brigham Young University Language and Intercultural Research Center to identify systems useful in bridging gaps in intercultural communications, the following six factors have emerged as paramount aspects where communication either succeeds best or consistently breaks down: (1) culture, (2) language, (3) interaction, (4) communication, (5) context, (6) environment. Each of these factors has been divided into several interrelated categories and components to represent the conceivably infinite number of divisions that could be made. These categories are the horizontal headings in Figure 1. An extension of these categories and a partial listing of possible components under each of these categories is provided in Appendix A at the end of this paper. An extensive familiarity with relevant components is necessary before this model can be used consistently by different translators—otherwise potential mis-cues would be analyzed in different boxes by different users. See Figure 1.
In "languetics" analysis each significant factor and component can be demonstrated as influencing or being influenced by messages as these confront cultural barriers. Intercultural communication involves much more than explicit definitions from 'culture,' which may have already been delineated acceptably for many anthropologists, sociologists, linguists, and others. The explicit (surface of 'plain') meaning of a message may be translated acceptably in many cases, but the cultural communicative mode and/or context of the message situation may affect the implicit (deeper, usually hidden--except to culture-participants) meaning(s) of that message.
The Languetics Model of Intercultural Communication serves as a framework into which relevant data can be organized and analyzed. In such a seemingly complex system, data can often be considered interrelated in several of the model categories. It is intended that the model account for such interrelationships and make them manageable. It would be unrealistic to isolate all the details of the factors, components, and their configurations and permutations--as these would constitute the "whole" of any given set of intercultural communications. Only the details that really make a significant difference to a successful intercultural interaction need to be isolated and dealt with. The categories included in Figure 1 may be critical areas where model is used more extensively, new communicative indicators may emerge and some of the present categories may be combined or redefined.

How can the model be used? A somewhat exaggerated example will be examined that is described in Andreas Fuglesang's text, Applied Communication in Developing Countries. (Sweden: Dan Hammarskjold Foundation, 1973). The example was chosen because it has elements from more categories than are usually encountered in a single message and can illustrate the use of all six factors of the model.

Some sanitation experts went to a Zambian village to lecture on the harmful effects of the tsetse fly. The lecturers, from an English-speaking country, could not speak the native language of the villagers. Interpreters were used. Intending to make the presentation more visual and impressive, the lecturers brought a large model of a tsetse fly. They were using an instructional technique which their own culture considered to be perfectly appropriate. For the Zambian villagers, however, the use of a large-scale model was completely foreign to their culture, and the meaning of the message was unacceptable, or lost. The villagers' reaction was, "It may be true what you say about this... but it cannot concern us, because the flies are not so big in our place."

Interpretation of the message from English into Zambian may also have caused some real problems, since many scientific or technical terms used by the sanitation experts do not exist in the Zambian language. The interpreters themselves may have been unfamiliar with the terms and approach used by the specialists, with the result that much of the message was either misinterpreted to their audience, or not interpreted at all.

From the brief summary of Fuglesang's account presented above and from further information that was included in his text, the message intended to be expressed by the English-speaking sanitation experts can be reconstructed under each
of the six main factors of our model, as can the message perceived by the Zambian villagers. These messages have been included in the appropriate boxes of the message column in Figure 2.

Figure 2

By comparing the messages expressed with the messages perceived, a fairly good idea of the categories under each factor that contributed to the miscommunication can be diagnosed. Each factor will now be considered one by one to explain the reasoning one might use to diagnose the problem areas.
In looking at the two messages for the culture factor, the main problem seems to be a disparity in the knowledge structure of the two cultures involved. The concept of disease being spread by germ-carrying insects and animals is present in the sanitation experts' knowledge store, but is not present in the knowledge store of the Zambian villagers. Auspiciously, this is the reason why the sanitation experts came to Zambia in the first place: to teach the Zambian villagers the concept of disease-causing germs and how the dangers produced by them can be eliminated or reduced. An X has been placed in the culture box under the category of education and knowledge simply to show that there was a problem in the communication related to this category. (How extensive the problem was and for whom is another consideration to be made, of course).

The message under the language factor is simply the verbal message that the sanitation experts attempted to convey. The message is straightforward enough, yet it was still misperceived by the Zambian villagers. There could well have been a strong nonverbal component to the communication which prevented the verbal message from getting through, therefore an X has been placed in the box under this category. Once we get to the communication factor, it will be found that the biggest problem was likely due to the art form used. There may have also been a problem with jargon the experts used which was not understood by the interpreters—the message in a sense was coded, and this code needed to be broken before the message could be accurately represented by the interpreters. Therefore, an X has also been placed in the box under the category coded.

Considering the interaction factor, it is obvious that the sanitation experts perceive themselves as being more educated (status) than the villagers and see themselves in the role of teachers to "villagers." They may even perceive themselves as being saviors to a primitive and backward people. They have come because of a strong sense of obligation to these "backward villagers." They are possibly there because of an empathy they feel for less privileged peoples, but there is likely a condescending attitude as well. On the other hand, the villagers perceive the visitors in the role of intruders with no real tribal status, but out of a sense of obligation to visitors, they are listening good humoredly, trying not to show their frustration at a condescending attitude from their strange visitors. X's have been placed in the status, role, obligation, and attitude boxes because of the respective differences apparent in the two messages under each of these categories. (Recall that depth and scope of each difference still is to be weighed as to relevance and effect.)
Turning to the communication factor, what is apparently one very crucial cause of the miscommunication is found: the art form. The large and impressive model of the tsetse fly, which was intended as a visual aid to clarify the meaning of the message, has been perceived by the villagers as a full scale model of supposed American (or British) tsetse flies. An X has been placed in the interpersonal box, as well as the art form box, to indicate that the reason for creating such a large model may have been because the communication was intended to be for a group of people. A life size tsetse fly could not effectively be seen by all.

The past memories category under the context factor undoubtedly reinforced the empathetic attitude and savior role of the sanitation experts in their own minds while at the same time reinforcing the condescending attitude and intruder role possibly perceived by the villagers.

Looking at the environment factor, the hotness of the weather and the stuffiness and smallness of the village hut (the locale for the meeting) undoubtedly added to the frustration felt by all present at the meeting, but probably wasn't enough, taken alone, to produce the miscommunication.

The number at the top of some of the boxes indicates a relative priority of attention that could be given to correcting the problem in each of the categories to achieve the elimination of the miscommunication: the lower the number the higher the priority for correction. In other words, the plan of attacking the problems would proceed from 1 to 2 to 3, and so forth.

Although there was likely a problem element present in all of the categories marked with an X, the element from some of the categories may not have been disruptive enough taken alone to cause the miscommunication or may have been related to an element from another category in such a way that elimination of the one problem could eliminate the other as well.

For example, using a more appropriate locally acceptable art form, or making it clear—in cultural terms—that the model was much larger than real life, might allow the verbal message to make it through the "nonverbal noise" created by the incorrectly perceived visual aid. This in turn might allow the concept to take hold among the Zambian villagers that there is a danger present in tsetse flies from their disease-carrying germs. Therefore, the villagers would be more likely to perceive the sanitation experts in the role of teachers, having some status, unlike earlier visitors to their country. Correspondingly, their attitudes toward the visitors might change for the better and their sense of obligation to accept and use new knowledge might be enhanced.
The above problem appears on the surface to have been primarily the result of an ambiguous or unclear message. However, it might just as well have been the result of an offensive message: the villagers might have been insulted by the use of a "childish" visual aid. Then the solution would have been quite different: an appropriate culturally rendered apology might have been in order, as well as an explanation—in local terms—that such visual aids are not demeaning in the culture of the sanitation experts. Whether the problem element was Ambiguous or Offensive or both is indicated in the figure by placing an A or an O at the bottom of each relevant category box. (A = Missed Cues while O = Mis-Cue. See p. ** preceding).

The example of the miscommunication in Zambia has attempted to illustrate how the model can be used to pinpoint the areas of variation between an expressed message and the message as it is perceived and/or fed back by a target audience. However, pinpointing the components of the message where the communication problem may lie is only a beginning step toward the goal of successful communication.

Though the model may be able to indicate where the problem lies, it has not indicated how to solve the problem. Much study and research needs to be done concerning the problem categories laid down in the languetic model. It is this research and study that will generate the information and motivation that are needed to solve intercultural communication problems. It is too time consuming and costly—and possibly otherwise infeasible—to study and research a problem area each time a specific problem is encountered. Therefore, all such information that is gathered must be brought together in a form that will be readily available to anyone else who encounters a very similar problem.

Likely the most useful way to store such information would be in a bicultural communication diagnostic lexicon of potential problem/solution categories for use when translating in either direction from one language/culture to any number of other language/cultures. Such lexicons could be incorporated into Multicultural Grammars and could conceivably be stored in a computer system which would make possible ready access to an appropriate solution of a potential problem.

The model we have been considering has two main uses with regard to such Intercultural Grammars and their related communication diagnostic lexicons: (1) as a tool in generating the lexicons, and (2) as a retrieval mechanism for locating—as in a thesaurus—the pertinent information in an Intercultural Grammar needed to produce a culturally appropriate message.
As a generating tool, the model can be used as illustrated in the example above to locate the categories responsible for ineffective communication by analyzing the disparities between expressed and perceived messages that are already available or that require analysis as ineffective cross-cultural encounters take place. The model can point out the areas where cultural differences in manners of expression are most likely to occur and can direct descriptive researchers to study in depth those areas that are most likely to produce profitable entries for specific Intercultural Grammars. The usefulness of the model in this respect may be analogous to the usefulness of sonar by the geologist to detect the areas beneath the earth's surface where it is most profitable to drill for oil. The ophthalmoscope of the oculist and the medical chart of a doctor also illustrate practical use of "people maps." By using the model, practitioners can save hours of time by directing their most concentrated efforts to those aspects of the target cultures that are most sensitive to the cultural habits of people in the message-producing culture and to intercultural relations, which can bring about the most successful communication.

Research into the sensitive areas of the above illustrated interaction between English-speaking sanitation experts and Zambian villagers might produce the following generalized entry for the English version of an English-Zambian Cultural Grammar:

The Zambian mode of instruction and learning focuses on the perception of the physical world. The Zambians do not respond readily to abstract conceptualizations of the world suggested by large models, charts and symbolization. One might say that they do not subscribe to the convention of pictorial representations found among Westerners. (Adapted from Edward C. Stewart--personal correspondence.)

This generalization could be elaborated further by including two or three specific examples of inappropriate symbolizations. Suffice it to say that one such example might very well be the one already elaborated: the giant model of a tsetse fly.

To make the model useful as a retrieval mechanism, Intercultural Grammars would be organized according to the factors and categories of the model. The sub-entries under each category could be listed alphabetically under each category as is generally done in Appendix A or they could be listed in the order of importance as are the major subcategories under NONVERBAL in Appendix A. This later listing has the advantage that it could be essentially in the same order for all languages and/or cultures.
The generalized entry example mentioned above probably could be included, or at least referenced, in an English-Zambian Intercultural Grammar three times in thesaurus fashion, so that it might be located under each of the three most likely category headings. These three headings would be those that received the three top priority ratings, namely: art form, nonverbal, and education and knowledge. (See Figure 2).

Once an Intercultural Grammar has been prepared, the model can be used to adapt an intended message from one language and culture so that it will be perceived in the target language and culture as it was intended.

Another example will now be considered to see exactly how the model can be used to diagnose a communication problem using an Intercultural Grammar. For the message in this example, a statement that actually occurs in a leadership training manual will be used—a statement that produced a very distressing situation when it was translated literally into the Japanese version of the same manual. The statement that created the difficulty reads as follows in the English version of the manual:

As an administrator of your home and as a good husband to your wife, it is very important to say, "I love you" to your wife once a day or more, and to give her a tender kiss when you leave home for your job in the morning and upon your return at night. (Quoted in Palmer, Spencer J., Every Nation, Kindred, Tongue and People, 1977, in press.)

Without mentioning what the distressing situation was, an examination of how it might have been avoided by using the languetic model and an English-Japanese Cultural Grammar will be made.

First, a representation of the model at the beginning of the Grammar would be consulted to see where the sensitive areas of English-to-Japanese are most likely to occur. A hypothetical diagnostic map of most of the categories have potential sensitive areas.
An examination of the message is now made to see what categories its important elements are likely to fall under. The message is about the husband being an administrator of the home, so family organization may be an important category. It involves the relationship of husband and wife to each other, so human relations and communication and the roles of husband and wife are likely to be important categories. It involves being a good husband and something "very important," so values might be an important category to consider. It involves expressing the emotion love, so attitudes and emotions might be important. Finally, it involves kissing, which is primarily a culture-specific nonverbal form of communication.

Rank order can be made for these categories, as indicated in Figure 4, by the numbers in the tops of the above mentioned category squares.
To save time, a detailed explanation will be given here to demonstrate how to look further in only two of these categories: the human relations and communications and the nonverbal categories. In consulting the subcategory listing in Appendix A under the category human relations and communications, the subcategory marriage constraints appears to be the best component topic to consider. In an actual Intercultural Grammar, a diagnostic model of each of the categories would also be found and could be used exactly like the model of the factors already illustrated. In a Grammar-Thesaurus, a page reference for each of the subcategory components would be listed so that one could easily use a thesaurus to find the diagnostic lexicon that would be most useful. The following might very well be part of an entry under the subcategory marriage constraints in a Japanese-English Intercultural Grammar:

In Japan, tradition makes a man hesitant to use verbal language to communicate the most important feelings of his heart. The Japanese believe that the most effective and impressive communication is not by words, but by heart-to-heart, nonverbal communication, and they are masters in these forms of communication.
Note that a similar comment could be included under the appropriate componential entries for the roles, values, and nonverbal categories.

Turning to the pertinent listing under the category nonverbal, the subcategory kissing looks like a profitable subcategory to consult. Under this category the following entry might well be found:

In Japan, it is generally considered to be immoral to kiss your wife in front of any other person, including your own children.

From the two comments quoted, the statement in the Japanese version of the manual could possibly be changed to read something like the following:

As an administrator in your home and as a good husband to your wife, it is very important to express your love to your wife once a day or more, and to express your affection when you are alone at night or in the morning before you leave for your job.

If the translator of the manual had had such an English-Japanese communication aid, he might have been able to avert the distressing situation encountered in the above example. The message as perceived by the Japanese husbands reading the literal translation of the English manual is expressed very well by the following quote from Seiji Katanuma, from Hokkaido:

We Japanese husbands have never had such a custom of kissing our wives openly, since it seems to us that kissing before our children's eyes or in public is shameful conduct, whether it is heavy or a light kiss. It is even more strange to us to say spontaneously, "I Love You" to our mates. If I suddenly said this at a certain time of day to my wife, she would suspect that I had become insane at last. If we say, "I Love You" in such situations, we feel it is rather an artificial fake expression. Is not the most important word in Christianity,"love?" It is at times distressing that there is so great a difference between us and you regarding the cultural implication of the word "love."

(Reported by Professor Katanuma at The Symposium of Mormon Language at Brigham Young University, May 31, 1973.)

The languetic model has been oversimplified to facilitate an explanation of its use and utility, but the explanation should nonetheless communicate to a translator or other intercultural communicator the potential worth of such a model and system of Intercultural Grammars.
Tyler: Enhancing Intercultural Communication

I. CULTURE (some examples)

A. MAN RELATIONS AND COMMUNICATIONS
   1. AFFECTION
   2. BURIAL RITES/CONSTRAINTS
   3. DATING
   4. CLOTHES, CARE OF
   5. ENTRANCE RITES/CONSTRAINTS
   6. ETIQUETTE, NONVERBAL
   7. ETIQUETTE, VERBAL
   8. FRIENDSHIP/LOVING
   9. GIFT EXCHANGE, SHARING
   10. GREETINGS
   11. MALE/FEMALE ROLES
   12. MARRIAGE RITES/CONSTRAINTS
   13. POLITICS
   14. SOCIAL GATHERINGS

B. ORGANIZATIONS
   1. COMMUNITY SERVICE
   2. EDUCATIONAL SYSTEMS
   3. FAMILY UNIT
   4. GOVERNMENT, POLITICAL
   5. RELIGIOUS DENOMINATIONS
   6. SOCIAL CLASSES/INSTITUTIONS

C. LIVING/WORK
   1. MEALS AND DIET
   2. WORKING CONDITIONS/CONSTRAINTS

D. VALUES
   1. COSMIC ORDER
   2. ECONOMIC CONSTRAINTS
   3. HUMAN NATURE (GOOD/EVIL)
   4. RELATIONSHIPS (SELF/OTHERS/AUTHORITY/NATURE)
   5. RELIGION
   6. STATE OF HAPPINESS/DISTRESS
   7. STATUS/SUCCESS
   8. VALUES AND IDEALS

E. EDUCATION/KNOWLEDGE
   1. CHANGE/GROWTH
   2. CHILD-REARING
   3. GROUP VS. INDIVIDUAL IDENTITY
   4. SCHOOLING

F. CUSTOMS AND RITUALS (Acceptable/Unacceptable ways of doing things)
   1. UNWRITTEN CODES
   2. WRITTEN CODES

G. TIME
   1. CALENDAR, CLOCKS
   2. HABITS
   3. PUNCTUALITY
   4. SENSE

H. SPACE AND MOVEMENT
   1. INTIMACY DIMENSIONS
   2. INTRUSION FACTORS
   3. MOBILITY
   4. SOCIAL DISTANCE
   5. TERRITORIAL MARKERS

I. LEISURE/RECREATION
   1. GAMES, SPORTS
   2. HOLIDAYS AND CELEBRATIONS
   3. RELAXATION
   4. VALUES OF TIMES AND SPACE

J. MATERIALITY
   1. COMMUNITY LIVING
   2. FASHION
   3. HOMES
   4. MODESTY
   5. PROPERTY/COMMUNITY
   6. PROPERTY/PRIVATE
   7. PROPERTY/UTILITARIAN

K. SYMBOLS
   1. MOURNING
   2. RESPECT
   3. HEALTH

L. HUMOR
   1. NEGATIVE
   2. NEUTRAL
   3. POSITIVE

M. TONES (HIGH VS. LOW CONTEXTS)
   1. IDIOLOGICAL
   2. "PRIMITIVE"
   3. "HUMANISTIC"
   4. "TRADITIONAL"

II. LANGUAGE (representative)

A. VERBAL
   1. SOUNDS (PHONETIC, PHONETIC)
      a. Change
         assimilation
         consonant sandhi
      b. Contraction
         assimilation
         consonance
         rhyme
         rhythm
   2. MEANS OF EXPRESSION
      a. Change of Meaning--Puns
         alliteration
         alliteration
         consonance
         consonance
      b. Change in Word Order
         anaphora
         anaphora
      c. Change in Word Order
         transposition
         transposition
   3. SYNTAX AND DISCOURSE
      a. Change in Meaning
         allegory
         allegory
         comparison by implication
         digression
      b. Change in Word Order
         anaphora
         anaphora
      c. Expansion
         description
         enumeration
         exaggeration
         parenthetical remark
   d. OMISSION
      a. Assumption
      b. Assumption
      c. Assumption
      d. Assumption
      e. Repetition
         chiasma
         correspondence
         parallelism
         redundancy
         refrain
      f. Repetition
         chiasma
         correspondence
         parallelism
      g. Repetition
         chiasma
         correspondence
         parallelism
      h. Repetition
         chiasma
         correspondence
         parallelism
   5. OTHER COMPOSITE PATTERNS
      a. Logic
      b. Rhetoric
      c. Stylistics
      d. Other Thought patterns

B. PARAVERAL
   1. ALLONOMIC VARIATIONS
   2. ARTICULATION
   3. ENVIRONMENT PATTERNS
   4. JUNCTURE
   5. INFLUENCES/GRANTS
   6. RHYTHM
   7. RHYTHM
   8. RHYTHM

C. NONVERBAL
   1. VISUAL
      a. BODY POSTURE
      b. BODY POSTURE
      c. BODY POSTURE
      d. BODY POSTURE
      e. BODY POSTURE
   2. EYES
      a. Looking
      b. Looking
      c. Looking
      d. Looking
      e. Looking
   3. MOUTH AND LIPS
      a. Smiling
      b. Smiling
      c. Smiling
      d. Smiling
      e. Smiling
   4. HANDS
      a. Clapping
      b. Clapping
      c. Clapping
      d. Clapping
      e. Clapping
   5. HEAD
      a. Chin
      b. Chin
      c. Chin
      d. Chin
      e. Chin
   6. SHOULDER AND TORSO
      a. shoulders
      b. shoulders
      c. shoulders
      d. shoulders
      e. shoulders
   7. SIGN LANGUAGE
      a. Sign Language
      b. Sign Language
      c. Sign Language
      d. Sign Language
      e. Sign Language

APPENDIX A:

Languages and Linguistics Symposium 1978
2. AUDITORY
   a. BELCHING
   b. BLOWING THROUGH FLAPPING LIPS
   c. CLEARING ONE'S THROAT
   d. CLICKING
   e. COUGHING
   f. DRUMS
   g. DUCK CALL
   h. GARGLING
   i. GRUNTS
   j. KISSING
   k. TAILORING

1. INTONATION PATTERNS NOT ACCOMPANIED
   - WITH VERBAL M. KISSING
   - MUSIC
   - NOISES
     - 1. Non-Human
     - 2. Vocanic
   - P. RHYTHM
   - Q. SCREAMING
   - R. SMOKE WHISTLE
   - S. SIGHING
   - T. SIRENS
   - U. VOLUME
   - V. WHISPERING
   - W. WHISTLE
   - X. YAWNING

3. Olfactory
   a. BAD SMELLS
   b. BODY ODOR
   c. BREATH ODOR
   d. BURNT ODORS
   e. CHEMICAL ODORS
   f. DISINFECTANT
   g. FLOWER SCENTS
   h. FOOD ODORS
   i. FRUIT SMELLS
   j. PERFUMES
   k. ROOM ODORS

4. Tactile
   a. CARESSING
   b. CLUTCHING TIGHTLY
   c. EMBRACING
   d. HITTING
   e. KINESTHETIC
   f. KISSING
   g. PAIN
   h. PINCHING
   i. PLEASURE
   j. PRESSURE
   k. RUBBING
   l. SQUEEZING
   m. SPANKING
   n. TEMPERATE
   o. TICKLING
   p. TOUCHING

5. Gustatory
   a. AGREEABLE
   b. BITTER
   c. BLAND
   d. DISAGREEABLE
   e. FAMILAR
   f. HOT
   g. SALTY
   h. SOUR
   i. STRANGE

6. Vestibular
   a. BALANCE

7. Spacial
   a. CLOSINESS
   b. SEATING ARRANGEMENTS

8. Temporal
   a. FUTURE ORIENTED
   b. LENGTH OF TASKNESS
   c. MAKING MOST OF PRESENT
   d. PAST ORIENTED
   e. PUNCTUALITY

9. Clothes Texture
   a. COURSE BURLAP
   b. FURRY
   c. HEAVY DENIM
   d. LIGHT CHIFFON
   e. SCRATCHY WOOL
   f. SILKY
   g. SOFT KNIT
   h. THIN NYLON

10. CLOTHES, HAIR
    a. CASUAL
    b. CONSERVATIVE
    c. EXTRAVAGANT
    d. FEMININE
    e. FESTIVE
    f. FORMAL
    g. INFORMAL
    h. IMMORAL
    i. MASCULINE
    j. MOURNING

11. EVENTS, SITUATIONS, ETC.
    a. ASSUMPTIONS
    b. INFERENCES
    c. INTELLIGENCES
    d. INFORMATIONS
    e. INVENTIONS
    f. INTENTIONS
    g. EXPECTATIONS

12. EMOTION AND CHARACTER COMPOSITES
    a. AGREEABLE
    b. PREOCUPPED
    c. POSTOCUPPED
    d. TELEPATHY

13. OTHER PATTERNS AND STYLES
    a. MICRO-MOMENTARY

D. PARANORMAL (see communication modes)
E. VERBAL INDICATORS OF NONVERBAL
   F. CODED (filtered, spliced)

II. INTERACTION
A. STATUS
   1. EQUAL
   2. PERCEIVED TRAITS
   3. UNEQUAL

B. ROLES/RELATIONSHIPS
   1. CANDIDATE/VOTER
   2. CHAIRMAN/MEMBER
   3. CLERGYMAN/LAYMAN
   4. DOCTOR/PATIENT
   5. EMPLOYER/EMPLOYEE
   6. HUSBAND/WIFE
   7. INTERMEDIARIES
   8. MALE/FEMALE
   9. MEMBER/OUTSIDER
   10. OFFICER/ENLISTEE
   11. PARENT/CHILD
   12. PERFORMER/AUDIENCE
   13. RULER/SUBJECT
   14. SELLER/BUYER
   15. TEACHER/PARENT
   16. TEACHER/STUDENT

C. OBLIGATIONS
   1. GREAT
   2. INDEPENDENCE
   3. NON-EXISTENT
   4. SLIGHT

D. ATTITUDES AND EMOTIONS (EGS ONLY)
   1. ANNOYED
   2. COMPROMISING
   3. CONFLATING
   4. CONTROLLING
   5. COOPERATIVE
   6. DISGUSTED
   7. EMPATHY
   8. EXCITED
   9. FALTERING
   10. HOSTILE
   11. INSULTED
   12. LOVING
   13. SHOCK
   14. SYMPATHETIC
   15. THREATENED

E. NOISE (NON-DISTRACTIVE)
F. STATIC (INTERFERENCE)

IV. COMMUNICATION
A. INTRAPERSONAL
   1. DREAMS
   2. FEELINGS
   3. PRAYER
   4. VISIONS

B. INTERPERSONAL
   1. INTIMATE
   2. CONSULTATIVE
   3. SMALL GROUP

C. MASS
   1. CEREMONY—RITUAL
   2. CONCERT
   3. CRUSADE
   4. DEMONSTRATION
   5. RALLY
   6. REVIVAL MEETING
   7. SPEECH

D. MODE OF DELIVERY
   1. COMPUTER
   2. CORRESPONDENCE
   3. DISCUSSION GROUP
   4. DRUMS
   5. FILM, STILLS
   6. FLAGS
   7. LECTURE
   8. LIGHTS
   9. MOTIONS PICTURES
   10. PRINT
   11. RADIO
   12. RECORD
   13. SATELLITE
   14. SMOKE SIGNALS
   15. TAPE
   16. TELEGRAPH
   17. TELEPHONE
   18. TELETYPE
   19. TELEVISION
   20. VIDEO TAPE

E. ART FORMS (AND COMBINATIONS)
   1. ARCHITECTURE
   2. DANCE
   3. DRAMA
   4. INTERIOR DESIGN
   5. LANDSCAPE
   6. LITERATURE
   7. MUSIC—INSTRUMENTAL
   8. MUSIC—VOCAL
   9. PAINTING
   10. PHOTOGRAPHS
   11. PICTURES
   12. SCULPTURE

F. PARANORMAL ELEMENTS
   1. EXTRA-SENSORY PERCEPTION
      a. Clairvoyance
      b. Precognition
      c. Postognition
      d. Telepathy
   2. ILLUSION
   3. INSPIRATION
   4. INTUITION
   5. MEDITATION
   6. PSI-KAPPA (MIND OVER MATTER)
   7. REVELATION

V. CONTEXT "SETTING" (REAL OR ASSUMED)
A. PAST
   1. BACKGROUND
   2. EDUCATION
   3. EXPERIENCE
   4. MEMORIES
   5. TRAINING

B. CURRENT SITUATION
   1. FEELINGS
   2. INSIGHT
   3. INTUITION
   4. PREDISPOSITIONS
   5. TALENTS

C. FUTURE
   1. ANTICIPATIONS
   2. ANXIETIES
   3. ASSUMPTIONS
   4. EXPECTATIONS
   5. INTENTIONS

D. EVENT CHAINS: (Composite of behavioral units of communicative situations.)
E. LANGUAGE CHAINS: (All verbal/non-verbal composites of meaningful interrelated expressions/expressions, essential to a message being understood.)
F. SITUATIONAL DIALECTS: (Manner of speech used for specific circumstances.)

VI. ENVIRONMENT
A. GEOGRAPHY
B. WEATHER–CLIMATE
C. LOCAL
D. ARCHITECTURE
E. ATMOSPHERE
F. PRESENCE OF OTHER PEOPLE
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Languages and Linguistics Symposium 1978
Tyler: Enhancing Intercultural Communication

INTERCULTURAL COMMUNICATIVE INDICATORS MODEL of "LANGUETICS"

KEY:
- ACCEPTABLE
- AMBIGUOUS / UNCLEAR
- OFFENSIVE / UNACCEPTABLE
- NOT AN INFLUENCE IN THIS COMMUNICATION

MESSAGE EXPRESSED: (FEEDBACK) ONGOING...
MESSAGE PERCEIVED:

CULTURE:
- HUMAN RELATIONS AND COMMUNICATIONS
- ORGANIZATIONS
- LIVELIHOOD
- VALUES
- EDUCATION
- KNOWLEDGE
- CUSTOMS AND RITUALS

LANGUAGE:
- VERBAL
- PARAVERAL
- NONVERBAL
- PARANORMAL
- VERBAL INDICATORS OF NONVERBAL
- CODED

INTERACTION:
- STATUS
- ROLES
- OBLIGATIONS
- ATTITUDES AND EMOTIONS
- NOISE
- STATIC

COMMUNICATION:
- INTRAPERSONAL
- INTERPERSONAL
- MASS
- MODE OF DELIVERY
- ART FORMS
- PARANORMAL ELEMENTS

CONTEXT:
- PAST
- CURRENT SITUATION
- FUTURE
- EVENT CHAINS
- LANGUETIC LINKS
- SITUATIONAL DIALECTS

ENVIRONMENT:
- GEOGRAPHY
- WEATHER
- LOCALE
- ARCHITECTURE
- ATMOSPHERE
- PRESENCE OF OTHER PEOPLE

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Languages and Linguistics Symposium 1978
INTERCULTURAL COMMUNICATIVE INDICATORS: LANGUETIC MODEL

CHALLENGES AND POSSIBLE SOLUTIONS

I. Intercultural Communicative Indicators. Devise and use intercultural grammars to:
   A. Consider pertinent differences/similarities (such as expectations, assumptions, values, behavior).
   B. Note both inhibitors (-) and enhancers (+) of culturally-loaded messages.
   C. Mark and take advantage of contexts, environments, participants, to provide communicative results.

II. Intercultural Grammars. Identify cultural communicative "Traps" ("Gaps"): Culturally Hidden (purposeful or not) Units of Meaning (CHUMS)
   A. Inhibitors
      1. Mis-cues
         a. offensive, provocative, intolerable
         b. result in miscommunication
      2. Missed cues
         a. unclear, meaning varied, meaningless, "different"
         b. result in noncommunication
   B. Enhancers
      1. Cues
         a. perceivable CHUMS
         b. explicit
      2. Clues
         a. lead to understanding
         b. implicit

III. Language Indicators. Identify denotative and culturally connotative meaning.
   A. Verbal (spoken, written/printed, implied)
      1. Morphological (arrangement in meaningful word forms)
      2. Syntactic (word arrangement in relations/functions)
      3. Lexical (development and definition of meanings and changes)
      4. Phonological (speech and sound systems)
   B. Para-verbal
      1. Punctuation, spacing, rate, pitch, tone, stress, silence, non-fluencies, etc.
      2. Logic and stylistic patterns, rhetoric
   C. Non-verbal
   D. Para-normal (illusions, ESP-expressed, PSI-kappa, etc.)

IV. Communication Modes (Indicators)
   A. Direct (interpersonal, group, mass)
   B. Mediated--print, broadcast, art, etc.--(interpersonal, group, mass)

V. Interactions and Constraints (Message Modifiers)
   A. Social, political, and other cultural variance
   B. Perspectives and conditions
   C. Experience
   D. Abilities
   E. Outlook and purpose (intention) including assumptions, biases, etc.

VI. Contexts and Environment
   A. Action chains
   B. Scope-status
   C. Languetic links

VII. Unique Encounters (separate instances of cultural communication)
   A. Greetings
   B. Visiting
   C. Talks
   D. Gestures
   E. Personal appearance
   F. Attitude
   G. Language
   H. House
   I. Work
   J. Social
   K. Political
   L. Education
   M. Health
   N. Mass media

Intercultural Grammars: Bridges of PEOPLE CULTURAL GRAMMAR Understanding
Communicative modes Environments Ongoing contexts
MISCOMMUNICATION+ NONCOMMUNICATION= MISMATCHED UNDERSTANDING

I. Required: A readily retrievable system for detecting and efficiently utilizing required data.
   A. Data required for the receptor but not present in a source situation or message.
   B. Data that is absent or ambiguous for either the originator or receptor.
   C. Data that is implied which must be made explicit.
   D. Data which is explicit but which may need distinct treatment.

II. Solutions
   A. PASTEL (Patterns and Styles of Thought, Expressions and Living)
   B. Interculturegrams with summaries and references
   C. Experiential Learning Aids (Communication Learning Aids)
   D. Intercultural grammar (guidelines, how-to's)
   E. Thesaurus of culture specifics (check BYU/LIRC media study for examples)
   F. Individual connotative lexicons
   G. Remkard (Microfiche Retrieval System)
   H. Computer read-outs, expanded texts
WHAT IS TRANSLATION

Larry K. Browning

My attempt here is to collect and try to organize factors which need to be faced as a first step in defining what translation may or may not be. I realized early that I could not give the answers, so decided to bring to you the problems and possibilities which would probably need to be considered in coming to any kind of agreement.

The question is a complex one. Imagine the following situations.

(a) A translator is given material and told, "We want you to translate this." Do both know what the other means by this? From my experience if this happened to me, my first reaction would be to ask, "How do you want me to translate it? I can transform it into my language on several different levels, for various types of audiences, faithfully or freely. What do you mean by 'translate' it?"

(b) Someone announces: "We are engaged in translation work." or "I am a translator." But what does he mean?

(c) A reader, or reviewer, or supervisor says, "This is a good (or, poor) translation." What does he mean? In what way is he evaluating it?

From one point of view, the range of kinds of translation runs from "word-for-word," to what is generally considered "literal" or "faithful", then to what some wish for, called "equivalent", and on to differing degrees of "free" translation. A next level might be "re-authoring." The extremes are not usually what are referred to when we talk about translation. But there is still a large range of interpretations in between.

Following are some of the questions I feel must be faced.

(1) How might meaning be altered if translation is not strictly formal, that is, closely reflecting the original? Changing meaning should be a serious consideration in much of Church translation. What should be considered a mistake? How can we evaluate translation?

(2) How do people really react to different kinds of translations? That is, do we need to try for
literary excellence in order to be read? What is readability?

(3) What is the relationship of the formal content, as the material is written, and the "overall" or "total" meaning, or implied meaning? That is, is there more in a piece of writing than is in the total structure? If so, can translators from other cultures be expected to capture nuances? How would a team effort help? Would team work be worth the cost?

(4) What should be done if material for translation is not written well? Could it be translated as is and require the original author to take some responsibility?

(5) What if the material is ambiguous, or unclear? Should the translator guess? If no, what can he do? If so, he may be wrong. Even if he is correct, what are the implications of the foreign language audience then getting material in better condition than the original audience?

(6) What is poor translation? An oft repeated criticism of translation is that it is non-standard. What is meant by this? Is there a standard? Can we judge more than formal accuracy. Probably no English speaker would say things as Truman Madsen, or Neil Maxwell do. Should we dismiss them as non-standard speakers because they don't say things as another native might? I have heard Taiwan translators judge something as poor because it came from Hong Kong and therefore influenced by a non-standard dialect, Cantonese. But, those judged neither know Cantonese, nor are they aware that the translators they are judging are native Mandarin speakers, who cannot even speak Cantonese. I have heard European translators in Salt Lake judged as poor because they are out of touch with the language back home. How valid or serious is this? I have heard the criticism of work as being non-native missionary-ese, when, the extent of the non-native's involvement has only been to coordinate the schedules of natives doing the work. We put up with foreigners using our language in "non-standard" ways, or our children as they are learning it. Can the Church not be expected to do the same for the translated words of its leaders?

(7) Is there such a thing as "equivalent" translation? Equivalent in what way? Formally equivalent or producing equivalent impact? But we often say that
cultures are different; and the reason we need to
translate is because languages are different. Then
how can different be made equivalent? Another
question about equivalence: "Equivalent for whom?"
Do all source language readers agree about the ori­
ginal and will the target audience uniformly agree?
If we insist on equivalent reaction to material,
wouldn't we need to make different "translations"
for audiences in sub-cultures of the original lan­
guage, because they may all react differently to
the material based on their Highland Scottish or
New Zealand environments?

(8) Where does translation cease and free authoring
begin? What if a translated piece does not really
fit in the literary tradition of the target cul­
tures? Can translation stand as a class of writing
on its own? The Book or Mormon and Pearl of Great
Price are the only models of translation with any
indication of the Lord's seal. Are they perfect in
literary excellence in English? Doesn't the fact
that we know they are translated help make them
acceptable in spite of technical problems? Aren't
they accepted as a separate kind of writing?

(9) What is really the place of transculturization in
translation? If we change something to become clo­
ser to the target culture, are we really translat­
ing the original? Do we need to always adjust
material, or can other people be expected to broa­
den themselves by learning of the culture of the
original, much as we need to do when reading the
Bible or Book of Mormon? I will take the bold step
of even asking: What is wrong with Wasatch Front
culture, as long as we don't preach that others
need to copy it? If there is found the necessity
to explain more than there is in the original or
explain something about the original, can't we con­sider this a job separate from the translation pro­
cess, and supplement it with notes, or even refer­
cence books as we have for the English scriptures?

(10) What kind of factors would affect a decision
regarding the approach necessary for a particular
piece of writing? Can we delineate different types
of material, different purposes, different kinds of
audiences? Who should make these decisions, the
translator or the administrator?

I don't know what can be done to attempt to resolve
these questions. But I feel strongly that we cannot depend
much on outside experts. Articles and books have been writ­
ten by many people, but they are engaged mostly in a parti­
cicular kind of translation. As a result they can speak quite authoritatively about Bible translation for different kinds of audiences, or about translation of creative literature, or about scientific technical material translation. But our translation work has elements of all these, and other factors as well. So we can't be swayed by any particular argument.

What I advocate is a rational study of all these questions, and not all-or-nothing, dogmatic judgments closing off consideration of other ideas and possible improvements.
The prominent psycholinguistic research defines the goals of psycholinguistics thus:

In contrast to linguistics in the narrow sense, which has in the past been mostly concerned only with determining the most economical description of language and its universal characteristics, the goal of psycholinguistics is to explain [1] how a speaker attains this competence in the first place, and [2] how he uses it in actual discourse. (Russell, Quigley, and Power, 1976:230)

Psycholinguistics is, then, concerned with both the connections between and the mutual influences of language and psychological processes. Recent emphasis in psycholinguistics has focused on the actual cognitive nature of linguistic capacity and the mental representations of language. The study of acquisition proceedings (i.e., the attainment or development of language) can provide insight into various components of linguistic capacity and mental representation. Psycholinguistics, then, though concerned generally with mental representations of language and the correlative psychological structures, specifically addresses questions of

(1) the attainment of language ability,
(2) the nature of linguistic capacity,
(3) the function of that capacity in communication, and
(4) the influence that linguistic capacity and linguistic structure in general exert on cognition.

Most investigations in psycholinguistics must necessarily rely upon linguistic theory of one form or another to guide the analyses. The assumption of structure-changing transformations and the distinction between Competence and Performance, prevalent in most existing linguistic theory, constrain psycholinguistic analyses in ways inconsistent with natural data. Investigation of child language is especi-

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1 Conceived to refer to both "Generative Semantics" as well as to "Interpretive Semantics."

Languages and Linguistics Symposium 1978
cially limited by these basic assumptions. These two concepts can be major stumblingblocks in the analysis of child language.

The distinction, based on the notions of Competence and Performance, between grammatical and nongrammatical (or "acceptable" and "nonacceptable") utterances artificially creates the illusion that only the "acceptable" class of utterances represents valid language, that utterances not of the acceptable type are non-language utterances (or else the theory disregards them altogether). The basic problem with using theories built upon only "well-formed" utterances (or "ideal speaker-hearer language") to investigate actual language processes is that normal language users (and most notably children) do not conform to the linguists' "ideal" rules for well-formed speech. Even though people don't use language in the way the "ideal "speaker-hearer" is proposed to do, linguistic theory for the most part is based on only those selected utterances which follow the "acceptable" pattern. This of course presents a great problem in analyzing child language—how is the data collector to know which of the child's utterances are ungrammatical (in the context of the child's primitive grammar) and which are not? A theory based only on "well-formed" sentences must be provided only with "well-formed" input or the resultant analysis will be irrelevant if not inaccurate. By this reasoning, transformational theories do not provide an adequate nor an accurate theoretical foundation for the investigation of child utterances because of the restrictions on the type of data such theories require. Children produce so few "well-formed" (in the usual transformational grammar sense) sentences that analysis can only progress by either (1) assuming much additional deleted underlying structure, or (2) by restricting analysis to very few utterances.

Because it doesn't restrict its analysis to only so-called "grammatical" utterances, Junction Grammar is one theory of language-analysis which does facilitate the investigation of child language. Junction Grammar admits as valid language utterances any in-context fragment or otherwise "ungrammatical" utterance, based on the premise that a language theory should reflect the capacities of the language user as exhibited in his actual use of language. Structure-changing transformations impose constraints undemonstrated in actual language data, demanding the internal construction of each statement in its entirety before vocalization takes place. Junction Grammar is uniquely suited to overcoming this problem: "there are no rules in Junction Grammar which bring about a structural change" (Lytle & Packard, 1974:9). That is, lexical strings are formed by the lexical component, cued by the language-independent junction tree, but the structure of the underlying junction tree remains unchanged. In Junction Grammar, lexical rules
interpret and select underlying structure, but there are no alterations or additions to the junction tree in any way. Children often make statements which would be considered unacceptable examples by current transformational theory. Junction Grammar, by accepting all utterances and avoiding structural transformations, provides a more appropriate outline for analysis of child language forms. Thus Junction Grammar can rightly claim to adequately represent child language as well as the normal adult form of language.

Junction Grammar holds that all languages are analyzable in terms of junction patterns, that junction rules are a set of language universals, and further, that certain languages make a more extensive or more productive use than others do of selected subsets of the universal pool of allowable junction rules. It follows, then, that specific languages will differ in (1) their selection and distribution of junction rule patterns (i.e., in the subsets selected), and in (2) the manner in which junction patterns are realized as surface strings:

While most languages would use the majority of the possibilities [the set of all allowed junction rules], no one language need necessarily use them all. Furthermore, it would not necessarily be the case that any two languages would utilize exactly the same subset, nor would any two persons using the same language, for that matter. (Lytle & Packard, 1974:25)

It also follows that a child's " primitive" grammar might very well be analyzed as an augmented paucity grammar, possessing both (1) rules gleaned from the adult version of the language involved, and (2) ungrammatical rules, incompatible with the adult version, included because of the child's inadequate understanding of the adult grammar.

In this paper, an analysis of a specific stage in the attainment of language is presented to show Junction Grammar to be an appropriate theoretical background for psycholinguistic research. Specifically, an analysis of Bloom's (1973:233-257) Allison-IV data based around Junction Grammar assumptions is presented. This analysis proposes Characteristic and Feature Aspects as distinctive components of Allison's stage-IV grammar, discussing Positive Immature Features, Negative Immature Features, and Characteristic Naming as representative of Aspects of psycholinguistic attainment grammars. This Junction-Grammar-based analysis shows that Junction Grammar does provide a sufficient and reasonable, indeed advantageous, theoretical foundation for psycholinguistic analysis and theory-construction.
A significant problem in language analysis is deciding which utterances to admit as constituting legitimate, meaningful communication. If the stance is taken of assuming the child to intend a full statement in certain contexts when only producing a fragment or a single word, the task of grammatical analysis is greatly affected in that a more complex underlying structure must be assumed than would normally be assumed for that of a single word (thus implying that the child generates the fuller structure, but during lexicalization chooses to leave out parts of the structure, due to context).

In the current analysis, certain short utterances are assumed to represent legitimate underlying structures with some deletion having taken place during lexicalization processes. The grammatical analysis of such structures proceeds much as if the utterance has been a complete sentence-structure until lexicalization processes optionally lexicalize only those nodes actually uttered. Herein is one difference between child and adult language—the optional deletion within child language of sections of structure not so optionally deleted in adult language. Often such deletions are massive, resulting in "naming" phenomena. In some cases, the deleted underlying structures can only be vaguely inferred from context; examples from the Allison-IV data (Bloom, 1973:233-257) are: 9.4 "box", 7.3 "bag", etc. It is unclear in these naming instances what the deleted underlying structures are (or if any even exist). The child could mean "here is the box", or "Mommy has the box", or "I see the box", etc., etc. Consequently, in such cases where no complete underlying structure is readily inferable, such naming utterances are considered as meaningful single fragments; no exact complete meaning can be reasonably inferred—neither can any complete underlying structure be reasonably postulated.

2 Much of child language can be analyzed as originating in one of two processes: 1) as a subset of adult language; i.e., having a selection of the same set of junction rules, but a more liberal use of additional options and these selected rules; 2) based upon a different selection of junction rules (much as the bases for foreign languages' differences). It seems that the first of these two possible processes is more tenable.

3 The numbering reference system employed in this paper follows Bloom's (1973) scheme, with one additional number, the linear order of the utterance, appended; e.g., utterance 9.4 is Allison's fourth utterance in section 9.
However, in most cases, the deletions the child has made are fairly obvious. This is perhaps the biggest contrast between child and adult language—the child seems to delete nearly anything viewed as redundant or obvious. Allison deletes according to context, subjects, objects, prepositions, and verbs. She does show normal adult deletion of the subject in a few instances (e.g., 23.1 "[you] pour Mommy juice"), most of which are normal imperatives; however Allison does sometimes retain the subject in an imperative context (e.g., 63.1 "Mommy eat cookie", 71.1/2 "Mommy comb hair"), an abnormal imperative.

Allison showed adult-like capacity with the quantifier more and the negative no, but did not exhibit competency in regards to other quantifiers or negative constructions (i.e., some, less, etc.; or not, n't, none, etc.).

In all, the various Aspects observed in Allison's speech can be grouped into two main categories: (1) Characteristics of her language, and (2) Immature Features, resembling in either a Positive or Negative way certain features of adult language. The naming phenomena discussed above represents a basic Characteristic in Allison's language; hiatused subject, object, preposition, and verbal elements, as well as missing grammatical markers, represent Negative Immature Features (that is, features of adult speech which are not exhibited in the child's speech); use of the negation no and the quantifier more embody Positive Immature Features in Allison's language.

VERTICAL PROCESSING

An additional Characteristic present in Allison's language which has much bearing for linguistic theory, and for

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4 The typical child language feature of deleting tense markers and possessive markers, etc. does not fall under this category of deletion. Allison did exhibit these typical ellipses, leaving out markers for 3rd person, progressive aspect, tense, and possessives.

5 Characteristics are features of speech present in the child's language which are not usually admitted as constituting valid language features in "ideal grammatical" speech. If such features were admitted as valid examples by conventional linguistic theories—e.g., if these features were part of the normal adult language scheme—such features would in the present schema be classed as Positive Immature Features.
language-generation in general, is the strong implication for a vertically-oriented cycle (Lytle, 1971:97-99); Ellsworth, 1976, Billings, 1973, Billings & Thomson, 1972) in the generation of many of Allison's speech structures. Vertical cyclicity refers to the notion that sentences/structures can be generated by sections—that the entire deep structure need not be completed before lexicalization can occur. This is compared to horizontal cyclicity, which demands that deeper-level structure be completed before any processing on a higher level can occur (as transformational theories must necessarily maintain, due to the requirements of variable reference as concerning the input to the transformational component [see Chomsky, 1965:136]). This Characteristic graphically exemplifies the inadequacy of a theory based upon structure-changing transformations—that of not being able to account for utterances apparently produced via a vertical cycle. Such utterances are common and natural to most native speakers, and are not at all aberrant or non-normal examples.

The Allison-IV data exhibit vertical cycling in several cases. Very often Allison produces a word or words, then waits for a short time (indicated in the Data by a single slash [/]), and then completes an SX by using the previously-uttered word(s) as part of the final structure (sometimes incorporating more than one pause). This type of structure-production strongly implies inner processes which (1) form finished surface structure in sections, not necessarily in complete structure-units, then (2) cycle back to the deep structure to process another section from deep to surface form. This assumes that each intermediate processing component can accept noncomplete SX structures as input. Allison's pauses indicate a vertical, not a horizontal, process is likely operating. Examples are many, a good representative is 4.1/2/3 "wiping/baby Allison/chair." This example shows hiatused self-subject and several hiatused markers (be-aspect marker and possessive-marker); its relevance to vertical cycling is in the pauses which appear after "wiping" and after "baby Allison." In each case, the child produced a significant portion of the utterance, then paused; after pausing, she then produced another meaningful portion, and so forth. This structure appears to be a complete structure (SV) as far as the child is concerned: she was, during the production of these portions and pauses, in the act of wiping off her chair. Because of context, there can be little doubt what the child intended the comment to be; the pauses are not significant to the communication, only to the construction—she quite obviously intended the three utterances to form a single complete unit. Consequently, these utterances would be diagrammed as one complete structure in Junction representation: (N+(V+(N$((A*(N*N)))+E)))

4.1/2/3 

"[self] wiping baby Allison['s] chair"
It should be pointed out that only utterances separated by a short pause (indicated by a single slash [/]) are considered in this analysis as indications of vertical-like processing.

THE CHARACTERISTIC AND FEATURE ASPECTS IN THE ALLISON-IV DATA

Within the Junction Grammar framework, several uniquely identifying Aspects are apparent in the Allison-IV data. These Aspects specifically define Allison's stage-IV dialect/language-form in a way not possible under the constraints of conventional theory. The following is a discussion of Characteristic Naming and Immature Feature (both Positive and Negative) Aspects found in the Allison-IV data. Complete listings of all utterances and structural representation, showing the various Characteristics and Immature Features discussed hereafter, are available from the author.

CHARACTERISTIC NAMING

"Naming" phenomena can be conceived of as originating from one of two probable processes: (1) massive deletion, wherein much of the underlying structure is optionally left out during lexicalization, so that only one word or phrase survives to the surface level, or (2) completed one section at a time are never completed, thus leaving the previously-processed section standing alone). In either case, the junction tree appears the same, because it is impossible to determine just exactly what the child has either deleted or was planning to add. Thus most Characteristic naming utterances are analyzed as fragments, part of a larger (yet undetermined) structure. Some representative examples are:

14.1 "apple juice"
40.2 "tiny cow"

IMMATURE FEATURES

Positive Immature Features. Allison showed facility (and seeming understanding) with both the quantifier more and the negation no. The quantifier more seems to be the only quantifier in Allison's vocabulary at this stage (22 months). Although she apparently handles more competently, she uses

6 See Bloom (1973:149) for criteria of divisions.
no other such restricting word in this corpus. Typical use is in requesting additional food or play, as in:

24.2 "more juice"
75.1 "more [of doing it] again"

The negation no appears in two contexts, as a predicate-level adverb, and as an S-level modifier. Allison apparently could not use any other negation marker; she uses no in contexts which would more normally call for not (i.e., in the case of predicate modification, as in 41.5/6). When produced in conjunction with the typical child language feature of leaving out markers and (in this case) the subject, it might be easy to misconstrue the child's underlying intent in a statement as abbreviated as 22.2 ("no eat krak" [krak appears to be Allison's term here for crumbs]), or 41.5/6 ("no oink"), especially when taken out of context. In context (Bloom, 1973:239, 245), these two utterances appear to approximately mean: Allison will not eat these krak," and "this pig does not oink." Allison was holding dirty crumbs in the context of 22.2, and squeezing a rubber pig whose squeekie-whistle was gone while uttering 41.5/6. Thus it is apparent that no is the only negation-operator in her grammar, since both of these examples would normally require a different negation-marker for such predicate-level modification (i.e., not).

As a sentence-level modifier, no was used in the normal way; e.g., Mommy would ask Allison a question, and the child would respond with, "no," then the corrected part of Mommy's question. It is interesting to note that she did not respond with a full sentence, only with the corrected part of Mommy's question. For example, in 49.1/2, Mommy asks,"is this the big cow?"; Allison responds with "no/tiny" (49.1/2). It is obvious to the child what "tiny" refers to, whereas an adult would be much more likely to respond with "it is the tiny one" rather than just "tiny."

Negative Immature Features. Child speech which does not follow the regular patterning of hiatus in adult speech. Typical is the lack of minor markers, such as possessive 's, but larger deletions also occur. The subject, object, verb, or preposition is often hiataused by the child. Usually the hiatused element is readily inferred from context; to the child, the missing element is obvious and therefore need not be verbalized.
Hiatused subjects. The subject in Allison's sentence could receive several treatments. At times the subject was properly deleted, as in the normal imperative 23.1 "[you-Mommy] pour [for] Mommy juice," wherein the subject is understood-you. However, Allison didn't seem to have a firm grasp on the normal rules of the imperative—sometimes she expressed command-like SX structures, verbalizing the subject (abnormal imperatives): 63.1 "Mommy eat cookies." Very often, Allison would hiatus the subject when she herself was specifically the subject. In this case, the subject would seem to be extremely apparent to the child:

35.3 "[self] open box."
76.2 "[self] drink apple juice again."

Allison often hiatused the subject even when it did not refer to herself. It would seem that the subject of very many of Allison's utterances appeared quite obvious to her. This type of subject-hiatusing appeared in SA, SP, and SV structures:

**SA:** 49.2 "tiny [cow]"
**SP:** 5.5 "[cookies] in bag"
**SV:** 58.1/2 "[truck's sharp edge] bang[ed] baby['s] back"

Hiatused Objects were also common in Allison's speech, both in SP structures and SV structures (that is, in those structures which allow objects). When spoken in conjunction with hiatused subjects, these utterances appear quite abbreviated; in-context description becomes necessary for correct interpretation. For example, 68.1 "squeezing" occurred as Allison was squeezing her cup; thus, 68.1 can be reasonably interpreted to mean "[self] [be] squeezing [this cup]." Example 57.2 is particularly relevant in this context, as it shows both a hiatused verbal object ("pig") and a hiatused prepositional object ("truck"). Again, it should be stressed that without the explicitly-described specific con-

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7 In relation to imperatives, Allison spoke a few seeming imperatives, 59.11 "be careful" and 35.11 "giddy up horse," which appear to be respectively normal subject-deletion (59.11) and abnormal subject expression (35.11). However, it would seem more reasonable that these two structures are functioning as idioms in Allison's language. They are representative of oft-repeated phrases ("be careful" and in-specific-context phrases ("giddy up horse"), both situations which most often evolve idiomatic expression. Consequently, these two utterances should be classed as idioms, rather than the more seemingly obvious variant imperatives.
texts (Bloom, 1973), such interpretations would likely be erroneous. In the case of 57.2, Allison was in the act of placing the toy pig onto the toy truck as she spoke the words "put on":

9.3 "Mommy open [box]"
57.2 "[self] put [pig] on [truck]"

**Hiatused Verbal element.** Allison saw fit to leave out verbs when that seemed obvious to her. (This type of hiatus invariably causes such utterances to be disregarded as valid data by most linguistic theory.) For example: 7.4 "[self] [take] diaper out" -- in context, Allison was in the process of pulling a diaper out of a bag while speaking 7.4.

**Hiatused Preposition.** Prepositional hiatus was exhibited often in this data. Specific prepositions are often fairly obvious from the situation, and thus don't really need expression. Many language's prepositional concepts are as non-specific in the surface structure as Allison's system apparently is. The prepositions under, from, on, at, for, in, and by all were hiatused by Allison in obvious situations:

31.1 "cookies [in] bag"
28.4/5 "[self] peek [at] Mommy"
24.4/5 "[self] dump [cookies] [onto] baby['s] diaper"

**Hiatused Markers were of four basic types:** (1) tense not expressed (on the verb), (2) progressive aspect be-marker not expressed, (3) third-person verbal marker [s] not present, and (4) possessive marker ['s] lacking. Allison used mostly simple verbs, although she occasionally did use an -ing form of the verb, but she never included the corresponding be-marker in conjunction with it.

(1) **Hiatused tense** was, of course, only detectable in utterances requiring past tense. This ellipsis was shown in such examples as:

25.1 "[Mommy] spill[ed] it"
48.1 "horse tumble[d]"

(2) **Hiatused prepositional be-marker.** Every time Allison used an -ing form of the verb, she invariably left out the appropriate be-marker for the progressive aspect. Apparently, Allison's grammar operates under the assumption that -ing is sufficient to express the progressive aspect. Allison never used her abbreviated form of the progressive in conjunction with an expressed (i.e., surface-structure-expressed) subject, it always appears in hiatused-subject contexts; perhaps this is a (artificial) constraint in her grammar of progressives.
43.4 "[cow] standing up"
76.1 "[self] squeezing cup"

(3) Third-person marker lacking. Invariably, Allison did not produce a 3rd-person marked verb with a 3rd-person subject. She always used the simple verbal form; e.g., 48.7 "cow moo[s]". Consequently, it sometimes is hard to distinguish hiatused progressive forms from the unmarked 3rd-person forms:

2.2 "baby Allison comb[s] hair" or
   "baby Allison [is] comb[ing] hair"
8.5 "baby eat[s] cookies" or
   "baby [is] eat[ing] cookies"

(4) Lack of the Possessive['s] marker is universal in Allison's grammar. Never does it appear, even when she repeats a normally-formed structure given by Mommy. This would indicate that the overt possessive is is merely an indication of deeper underlying structure which binds the constituent structures together, regardless of surface structure indicationing. Examples are:

15.4 "[self] eat Mommy['s] cookie"
32.3 "[self] put away Allison['s] bag"

CONCLUSION

Work is still continuing in this direction, but this analysis and these examples do show Junction Grammar to provide a sufficient, reasonable, and indeed superior theoretical basis for psycholinguistic analysis and theory-construction.
REFERENCES


SOME PROPOSALS FOR JUNCTION GRAMMAR

Mike McOmber

There are two methods available in processing JG operators. The first we will call Dominant processing (See figure 1). This is used in the case of mathematical subtypes of conjunction,1 for example, \(5 + 3\). 8 is the result, and this value is assigned to the dominant node. This follows the standard procedure of algebraic structures.2 This resultant value 8 can then in turn be divided by two. The top-most node, or root of the tree is then assigned the value 4. 5, 3, and 2 are terms in the statement, and terminal nodes in the tree.

A second method of processing involves assignment to a terminal node, as in the case of interjunction in figure 2. First we take boy "and test . . . for cross-reference to an adjunctive environment . . . which matches that of who in the junction tree (who is wearing a hat). Assuming [an index of boy] does match the prescribed environment, it . . . become[s] in effect the assigned value of who."3 This process of environment matching, or cross-referencing, is none other than intersection in set theory. It is just one operation or matching process that JG describes, but that fact is only indirectly reflected by the tree, which has five nodes and two operators. The resultant value is being assigned to a terminal node.

Were we to represent the math example in this way, we would have the following in figure 3, where again a terminal node is assigned the result of our 5 "in the [additive] environment of" 3. And what are the values for nodes A and D? \(8 + 3 = 11\) has nothing to do with the original problem, \((5 + 3) \div 2 = 4\). Node D is extraneous to the wffs. In order to continue as before and divide 8 by 2, it becomes obvious that we must assign 8 to node A anyway. This makes the terminal assignment redundant. Following further instructions for the relative, we pick up another redundant terminal assignment (figure 4). The can be treated as a constant4 rather than a redundant variable.

1M 125.
2D 438.
3M 65.
4P 227.
Reversing this situation, let us place the relative clause in the more economical math format, where the dominant node is the sememe, sick boy. Note that this diagram uses half as many nodes and operators (figure 5).

It is inconsistent to use two methods in the same system. One will do, and can handle both situations more clearly, simply, and economically.

"The schematic expression for interjunction is \( Z \rightarrow X \ast Y/D \). The elements of the formula correspond to the following tree fragment: [figure 6] \( Z \rightarrow XY \), and \( ZD \rightarrow Y \) are the corresponding production rules."\(^5\) Now, it is clear that \( Z \rightarrow XY \) corresponds to the JG rule \( X \ast Y \Rightarrow Z \) where the juxtaposition of XY corresponds to the operation \( \ast \). But what does the second rule correspond to? There is no such rule in the JG schemata, and no operation in the tree for \( ZD \). Leaving the operation out of the production rule in the JG discussion, and replacing it with juxtapositions obscures this fact. Calling the production rules "node-admissability conditions"\(^6\) doesn't alter the fact, or provide the missing operation.

Though we are told that JG trees may be generated top-to-bottom, or bottom-to-top,\(^7\) it has not been made clear whether we are to consider such generations as two distinctly directed graphs, or both of them as being one undirected graph.

Since directed graphs (diagraphs) allow any relation \( E \) for a graph \( G(V,E) \) we are concerned that in the formalism, a separate treatment is needed with a partial ordering \( R \) to produce trees. The subsequently required transform function is given, as the labelling function \( f \) "from the field of \( R \)."\(^8\) But we are not told specifically what this function is--its equations or mappings are missing. It cannot be the standard \( 1: V \rightarrow Av \) since, as we have seen, the production rules do not strictly correspond to the underlying algebra of JG. This function, however, becomes the crux of the for-

\(^{5}\) B 9, 10.


\(^{7}\) C 9.

\(^{8}\) D 292.

\(^{9}\) D 192.
malization because it is the one part that would guarantee that our trees produced by $R$ truly reflect and adequately represent derivations in JG. The formalization glosses over this in one line (figure 10).

The heart of the difficulty rests with the interpretation of the "link" node $C$ of figure 9. For example, if * and + are to remain binary operators, we need two nodes for $C$ at some point in the derivation. Each operator selects an appropriate $n$-tuple and assigns to it an image.\footnote{A} This would give us 6 nodes rather than just 5, and two unchained trees.\footnote{B} Two elements selected may have one and the same value, but that fact does not make them one and the same element, any more than two people with the same age are only one person. Preserving the laws for $n$-ary operators requires two $C$'s, one node for each selection, and so far, two trees.

What do link numbers, or the slash symbol represent? We have two alternatives (see figure 11).

Alternative 1: The slash is a syntacto-semantic operator. Then, as with other such operators in JG it is to be represented by a triad in our graph, giving us a third dominant node. This violates the laws for operators since three operations require three distinct tuples (we are missing two nodes) and because it doesn't follow the partial order $R$ of the formalism. It doesn't really resolve the identity problem of the two $C$'s. Also note that the JG application of such a rule leads to an infinite recursion of intersect nodes and slashes (at exponential proportions) since each interjunction thus represented produces two more such interjunctions.

Alternative 2: The slash is not a syntacto-semantic operator but merely manipulates subtrees (see figure 12). This makes subtrees $A$ and $D$ separate bases which the slash post-operatively\footnote{C} connects into one tree, making a double-

\footnote{A}{\text{A} 22.}

\footnote{B}{(2 operations x 2 pairs) + 2 images.}

\footnote{C}{The trees are unchained until the slash performs; i.e., after the other operators (*) and (+) that the $C$'s participate in, have performed. If the slash is taken pre-operatively, then we are back to the first alternative, where the distinctness property of the tuples is violated.}

\footnote{K}{231. Even the TGians have abandoned this transformation.}
Some Proposals for Junction Grammar -113-

base transformation. Nominalizations with repositioning of elements ("puppy" effect) as well as much of the various lexical rule components are further examples of transformationality in JG.

Either alternative 1 or 2 leads to a contradiction in JG.

OBJECTIONS

So far, objections to a diagram like boy * sick (figure 13) fall into the following categories:

Objection 1: The Nominalization

"The configuration [N * Adj = N] implies that the adjective is nominalized (note the dominant node), while sick in the sick boy is clearly not nominalized. The simplified structure, as it turns out, corresponds to a valid possibility, namely a nominalized adjective, sickness." Following this reasoning, however, boy who would have to be nominalized also, according to the JG diagram for tree-ness. Although boy who has a different subtype than tree-ness on a higher order of specificity, the same is true of boy * sick. Objection 1 is inconsistent; counterexamples are available.

Objection 2: Individual versus Class Reference (fig. 14).

The single triad diagram "fails to express the important semantic fact that the sick boy makes reference to both a class of humans (boys) and an individual human. Only the class reference is shown." This is not true. The dominant node is individual reference. Compare the examples adapted

---

16 M 12, 13. We are told on the same page that "this list does not cover all the possibilities."
17 M 190.
18 M 12.
19 If A has more than one member, then the additional implicit modification required to make the quantifier true reduces A by further intersection down to a unique singleton.
20 E 252, 257a.
McOmber: Some Proposals for Junction Grammar

from Packard's \textsuperscript{20} and Reichenbach's \textsuperscript{21} systems. The confusion over dominant versus terminal assignment is what led to objection 2.

Objection 3: Adjunctive "levels" of modification.

"Statement and Predicate nodes [in figure 14] are not available to accommodate adverbs . . . [without] making sentence adverbs and manner adverbs appear to be a single class."\textsuperscript{22} But definitions for placement of sentence versus manner adverbs are ad hoc and circular in reasoning: a modifier comes off the PV because it means manner . . . and it means manner because it comes off the PV. The semantics that determine SX versus PX (or X) level must be handled in the operators themselves or the categories in order to fit the rest of the JG system consistently. PV level, for example, means that the left operand is a PV. How can one operand affect another outside of the junction operation? There are at least two types for each level to choose from, and five for PX alone.\textsuperscript{23} Either the modifier at B (and its associated delta structure) includes the information for <manner> or it does not. (See figure 15.)

Alternative 1: B includes <manner>

Then its left operand, or "level", associates a matching process which is redundant to the system. If a match can take place, then the required information is in the modifier already, making it redundant to place it elsewhere and then require such a match. If on the other hand, as in

Alternative 2: B does not include <manner>

then we wonder what a manner adverb such as deliberately is supposed to mean without the <manner> part. If, as we are told, "junction rules can be used to diagram fragments of discourse as well as . . . [complete] sentences"\textsuperscript{24} the fragments unfortunately and deliberately should also be diagramable with or without their respective sentence or manner meaning. As it stands, however, those meanings are lost from the adverbs, unless these adverbs are joined to something at a correct "level." A second question is, how is it

\begin{itemize}
  \item \textsuperscript{20}R footnote on 192 incorporated into Packard's model.
  \item \textsuperscript{21}M 12.
  \item \textsuperscript{22}F 85.
  \item \textsuperscript{23}C 2 on 9.
\end{itemize}

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determined which of the various PX level meanings to assign to the adverbs as we join them? This has not been explained, but is crucial to the issue. Also, if the modifiers are only "suited" to one particular PX sememe choice, the mechanism of signaling or flagging such suitability is comparable to the sememe matching process itself. Either alternative results in an ad hoc process.

Objection 4: Referential Overlap.

JG uses a "proximity principle" (figure 16) to distinguish a relative construction from a complement, as in the ambiguous example the fact that John learned... Focusing on the subjunction triads themselves, we notice that the right operands are already distinctive in category. The structures, then, are sufficiently distinct without a proximity feature. Also, there are constructions for numerous counterexamples for distant topics and antecedents:

See that each neighbor puts a smoke alarm in his house and that he warns his neighbor to do likewise. In case he fails he is not only putting his life in jeopardy... etc.

Also, English passive constructions use a form of distant "overlap" or co-reference (see figure 17).

---

Another difference not shown in the abbreviated subtree (designated by the node label plus delta) exists between the two that's. That (relative) is one pro-form, while that (complement) is a sentence article, i.e., Reichenbach's iota-operator. See R 272 and 258. Junction Grammar adopts much the same idea, but is forced to assign entry or recovery to every modifier. Counterexamples such as "the house which I have decided to build" show that the hearer need not have been given identifying information (which I have decided to build) before the operation. To say that the hearer waited for the relative clause nullifies the difference between that example, and "a house which I have decided to build" (the speaker has not pre-announced his plans). The only difference in the two is that a means there may be more than one, and the means there is not. The clause after the a + house is just as "enterable" or "recoverable" as the same clause is in the example for the.

At least those used in JG, and probably nowhere else. It is remarkable that the redundancy of the JG passives are the very counterexample--two inconsistencies in one.

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The traditional treatment of relative clauses is to subtype them further as adjectival or adverbial. This would also give sufficient distinction between relative and complement. 27

**Objection 5: Order of Operation Processing.**

Here the famous examples 28 are (figure 18):

1. The boys **who** are poor need money, but the others1 don't.
2. The boys **who** are poor need money, but the others2 don't.

In sentence 1, because of the emphasis on **who** are poor others1 means boys other than those who are poor (e.g.: rich boys) or B-W (notice that B is on the left). In sentence 2, because of the emphasis on boys, the others2 means those who are poor but not boys, (e.g.: poor girls) or W-B. JG tells us that "[intersection] actually won't do, because the order [W-B versus B-W] makes a difference." 29 In other words, subtraction is not commutative. But what do the two remainders B-W and W-B have to do with the intersection? All three are distinct subsets. The JG argument is saying that because subtraction doesn't work, intersection doesn't. That's a non sequitur. 30 Intersection works just fine. Suitable equations are shown in figure 19. B-W = B \( \cap \) W and W-B = B' W. Notice in figure 20 that the correct order of the operands is maintained, with B always on the left. The reference of boys who are poor remains the same throughout,

--------

27 Other problems for sentential embedding are the antinomies which result from failure to distinguish between levels of language, as the logicians use the term. In JG, examples like "This sentence is false" come out as meaningful wffses. See Reichenbach, 40.

28 B 22.

29 The actual version of this argument presented in B 21, 22 has additional contradictions which have been removed here for clarity. His discussion of super/subsets contradicts his reference to the commutivity problem in set subtraction. Since it is specifically the subtraction argument that he uses against intersection, we kept that portion in our discussion and corrected the super/subset concept.

30 A logical term for an error in reasoning where a consequent does not follow [Latin], from its unrelated (but often true) antecedent.
always B W. In calculating this phrase only the intersect operator is taken. In computing the value for others however, the result is determined with the not operators taking the complement of any emphasized node/set.

Then there is the possibility that both parts are emphatic, as in 3. Here others3 means rich girls, etc. The current JG method fails here, and the example is missing from their discussion. Another missing example is 4: here others4 means anyone else but boys. Then how can the who node be considered when it does not exist? There is another generalization: Notice that in every case, not operations coincide with emphasis. The inconsistencies associated with the reasoning supporting interjunction hid this fact.

Axiomatic contradictions [transformationality], circular reasoning, and redundancy need to be checked for throughout all of JG. The formalism needs to be completed, definitions made, and most of all, interjunction should be eliminated in favor of intersection. Eliminating the redundancies and extraneous parts means less confusion for the student or translator learning the system, and lower computer bills for the company paying for it.
Fig. 1

DOMINANT NODE ASSIGNMENT

\[(5 + 3) \div 2\]

taken from 
Linguistics 501 Materials 
page 125 with:

+ for &+

* for &*

Fig. 2

TERMINAL NODE ASSIGNMENT

boy

ADJUNCTIVE

ENVIRONMENT

is wearing a hat

TO

TERMINAL

NODE
3 Math Example in format for Relative Clause Example:

```
+ 2
A  D
8  127
-
5  8  + 3
```

Redundant
Extraneous

4 Additional Processing

```
SV
+ PVA
W
= The
W
boy
SV
W
who
PVA
is wearing a hat
```

5 Relative Clause Example in format for Math Example:

```
sick boy
A
B n C
boy sick
```

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Figure 6

INTERJUNCTION:

\[ Z \rightarrow X \ast Y/D \]  
\[ \text{MISSING OPERATION} \]
\[ Z \circ D \]
\[ X \ast Y \]

Figure 7

PRODUCTION RULES:

\[ Z \rightarrow XY \]
\[ Z \ast X \ast Y \]
\[ Z \circ D \rightarrow Y \]
\[ Z \circ D \ast Y \]
\[ \text{NOT IN JG} \]

\[ Z \]
\[ X \ast Y \]
\[ Z \circ D \]
\[ Y \]

Figure 8

\[ G = (V,E) \]
\[ I: V \rightarrow A \]

Figure 9

\[ A \]
\[ D \]
\[ B \ast C \ast E \]
\[ \equiv \]
\[ A \]
\[ B \ast C \ast E \]

**INTERJUNCTION SCHEMATA ARE EQUIVALENT TO INTERSECTION**

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fig. 10

x is R-quasi-terminal iff x is R-terminal or for some unique z, z is R-terminal and x is an R-immediate predecessor of z and z is not an R-junction node. (Thus 6, 8, 2, and 1 are R-quasi terminal, but 3 and 5 are not.)

x is R-maximal iff for every z, if zRx then xRz. (Thus 3, 7, and 15 are R-maximal.)

xR-commands y with respect to z, iff for some n, for distinct $x_1, \ldots, x_n$
1. $z=x_1$ and $y=x_n$ and for some $i \leq n$, $x=x_i$
2. for every $i \leq n-1$, $x_iRx_{i+1}$ or $x_{i+1}Rx_i$, and if $x_{i+1}Rx_i$, then $x_{i+1}$ is R-maximal and $x_i$ is R-terminal.
(Thus, 5 R-commands 13 with respect to 3 via the chain 3, 5, 6, 12, 13.)

Junction Trees

A system $F=(R, f, s, L)$ is a left-right ordered labelled junction tree iff

1. R is a finite partial ordering that is interconnected, loopless, has only quasi-terminal junction nodes, and only branching non-quasi-terminal nodes. (R is a junction tree.)
2. f is a function from the field of R. (f is the labelling function.)
3. s is R-maximal and L is a strict partial order on the field of R and for every $w, x, y, z, x, y', y''$ (L is the order relation on R, s is the start node.)
   a. if $w \neq x$, and $y$ is an R-immediate predecessor of $w$, and of $x$, then $wLx$ or $xLw$ (Thus, 2L5 or 5L2.)
   b. if $w \neq x$, and w and x are R-immediate predecessors of y, then $wLx$ or $xLw$ (Thus 12L7 or 7L12.)
   c. if w R-commands x, y, and z with respect to s and wRx, y, and z then if $xLy$ and $yRz$, then $xLz$ and if $xLy$ and $xRz$, then $zLy$ (Thus if 2L5 then 2L4 and 1L5.)
   d. if w is R-terminal and w R-commands x with respect to s, then $wLx$ and if $wLy$ and $zRw$, and y then $xLy$. (Thus, if s=3 then 6L13 and 6L11 and if 6L4, then 1L5L4 and 1L14.)
   e. if w is R-terminal and w R-commands x and y with respect to s, and $x \neq y$ and $x, y$ are R-maximal and x R-commands $x', y'$, and $x''$ with respect to s, and y R-commands $y', y''$ with respect to s, and $x'Ly'$, then $x''Ly''$. (Thus, if 12L7 then 16L9 and 13L9.)

Def. 2. Let $F=(R, f, s, L)$ be a left-right ordered labelled junction tree.

x is the terminal string of F iff for some n, for some $x_1, \ldots, x_n$,
1. for every $i \leq n-1$, $x_iLx_{i+1}$
2. $x_1, \ldots, x_n$ are the R-terminal nodes
3. $x=(f(x_1), \ldots, f(x_n))$.

Junction Grammars

Def. 3. A structure $G=(L, T, J, M, S, P)$ is a junction grammar iff

1. L is finite (the set of labels)
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Figure 11

ALTERNATIVE #1

THE SLASH IS A (SYNTACTO-SEMANTIC) OPERATION

\[
\begin{align*}
A & \quad F \\
B \star C / C + E
\end{align*}
\]

*: \((B,C) \rightarrow A\)  /: \((C,C) \rightarrow F\)  +: \((C,E) \rightarrow D\)

Figure 12

ALTERNATIVE #2

THE SLASH IS NOT A (SYNTACTO-SEMANTIC) OPERATION

\[
\begin{align*}
A & \quad I \\
B \star C && D
\end{align*}
\]

TWO TREES

BECOME

\[
\begin{align*}
A & \quad D \\
B \star C + E
\end{align*}
\]

ONE TREE

TG's DOUBLE-BASE TRANSFORMATION (SEE KOUTSOUDAS, P. 231)

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Figure 13

**OBJECTION #1 NOMINALIZATION**

- sickness
  - N
    - N: ness
    - Adj: sick

- sick boy
  - N
    - N: boy
    - Adj: sick

- treeness*
  - N
    - N: ness
    - N: tree

- boy who
  - N
    - N: boy
    - N: who

*from Linguistics 501 Materials page 190
Figure 14

**OBJECTION #2: INDIVIDUAL REFERENCE**

![Diagram](image)

[Figure 4 on page 12 of Linguistics 501 Materials]

**SOLUTION:**

![Diagram](image)

Syntax: $N + AN$

Semantics: $N = A \cap N$

---

**PACKARD**

**REICHENBACH**

$F = Df \{x | f(x)\}$

$\circ: f \rightarrow F$

$f \cap N \equiv F \cap N$
OBJECTION #3:  ADJUNCTIVE LEVELS

<table>
<thead>
<tr>
<th>X</th>
<th>PX</th>
<th>SX</th>
</tr>
</thead>
<tbody>
<tr>
<td>-motion, destination</td>
<td>-time, when</td>
<td>-speaker's, attitude, opinion</td>
</tr>
<tr>
<td>-to where, from whence</td>
<td>-manner, how</td>
<td>-vocatives, nouns</td>
</tr>
<tr>
<td>indirect objects</td>
<td>-static location, at where</td>
<td></td>
</tr>
<tr>
<td>-indirect objects</td>
<td>-reason, why</td>
<td></td>
</tr>
<tr>
<td>to whom, to what</td>
<td>-degree, how much</td>
<td></td>
</tr>
<tr>
<td>-adverb particles</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PV-level operation means that the left operand is a \[\ldots\ldots\] PV \[\ldots\ldots\] B <manner> (or flag for it)

How
1. <time>
2. <manner>
3. <location>
4. <reason>
5. <degree>

Do we choose?

REDUNDANT MATCHING PROCESS

1. B includes <manner> Then we have a redundant matching process with the "PV level"
   "Level system" is then \textit{ad hoc}.

2. B does not include <manner> \textit{deliberately} - <manner> = ? How do we diagram these fragments?
   How is a selection made from the list of five possibilities?
   Any signal or flag at B is homomorphic to the process in alternative #1.
Figure 16

OBJECTION #4 REFERENTIAL OVERLAP: THE PROXIMITY PRINCIPLE

The fact that John learned... Ambiguity

RELATIVE

COMPLEMENT

Different right operands already distinctive

COUNTEREXAMPLE

See that each neighbor puts a smoke alarm in his house and that he warns his neighbor to do likewise. In case he fails he is not only putting his life in jeopardy...

TRADITIONAL GRAMMAR:

ADJECTIVE CLAUSE (RELATIVE)

NOUN CLAUSE (COMPLEMENT)
It is believed by many people that colds have been discovered to be cured by Vitamin C.

DISTANT "OVERLAP"
(co-reference)
OBJECTION #5 \hspace{1cm} ORDER OF PROCESSING INTERJUNCTION

1. The boys who are poor need money, but the others don't.
2. The boys who are poor need money, but the others don't.

1. boys who are poor

\[ B - \ast W \]

2. boys who are poor

\[ B \ast - W \]

\[ \text{OTHERS}_1 = B - W \hspace{1cm} \text{OTHERS}_2 = W - B \]

(e.g.: rich boys)

(e.g.: poor girls)

\[ B: \text{all Boys} \]
\[ W: \text{all Who are poor} \]
\[ B-W: \text{all Boys minus all Who are poor} \]
\[ W-B: \text{all Who are poor minus all Boys} \]
\[ B \cap W: \text{all Boys Who are poor (regardless of emphasis)} \]

3 DISTINCT SUBSETS

\[ B-W \neq W-B \]

Set subtraction is NOT commutative

Intersection set is distinct from either subtraction set

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1. \( B - W = B \cap W' \)

2. \( W - B = B' \cap W \)
Figure 20

**OPERATION (') CORRESPONDS WITH EMPHASIS (')**

1. The boys who are poor need money, but the others_1 don't.
   
   \[ \text{B, W'} \quad \text{OTHERS}_1 \subseteq \text{B} \cap \text{W'} \]
   
   (rich boys)

2. The boys who are poor need money, but the others_2 don't.
   
   \[ \text{B', W} \quad \text{OTHERS}_2 \subseteq \text{B'} \cap \text{W} \]
   
   (poor girls, poor men)

3. The boys who are poor need money, but the others_3 don't.
   
   \[ \text{B', W'} \quad \text{OTHERS}_3 \subseteq \text{B'} \cap \text{W'} \]
   
   (rich men, poor girls)

4. The boys need money, but the others_4 don't.
   
   \[ \text{B'} \quad \text{OTHERS}_4 \subseteq \text{B'} \]
   
   (men, girls, women)

Reference (dominant node) for boys who are poor is always B \cap W

Reference for others \_n includes the not operator (')
"Sick boy"  Comparison
(Each tree is reversed for effect)

PROPOSAL:

THROUGHOUT JG, EXCHANGE

Current JG interjunction:

6 nodes

\[
\begin{array}{c}
SA \\
\downarrow \\
PA + N * N \\
+ A \\
sick + A \\
\end{array}
\]

3 operators

boy

FOR

Same structure with errors removed:

3 nodes

\[
\begin{array}{c}
N \\
\downarrow \\
A n N \\
sick boy \end{array}
\]

1 operator

PLUS:

Check all junctions for similar errors in formulation
Check entire grammar for contradiction and inconsistency

Languages and Linguistics Society 1978
McOmber: Some Proposals for Junction Grammar

REFERENCES

<table>
<thead>
<tr>
<th>Reference</th>
<th>Source in Footnotes</th>
</tr>
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TEACHING LITERACY IN THE BOOK OF MORMON

Dorothy M. Hansen

This is a report of and observations on experiences gained while conducting a pilot advanced literacy project for the Church Education System in Mexico City during the summer of 1977.

A beginning literacy program has been used by the Church Education System throughout Central and South America. This program teaches basic phonics skills and teaches the students to read any words within their speaking vocabulary. The standard of the Church literacy program is for every member to be able to read and understand the scriptures. Students coming out of the basic literacy program are sometimes able to go directly into the scriptures but often are not. This project was an attempt to teach members of the Church with marginal literacy skills how to read and understand the scriptures. The project was based on the following assumptions: 1) that phonics and vocabulary skills are not adequate to insure the higher levels of comprehension required by the scriptures; 2) that it is unnecessary to use a graded approach to produce literacy in the scriptures, and 3) that the scriptures are a content specific area which require specific reading skills; in other words, a general competency in literacy can not be assumed to be adequate to enable a person to fully understand the scriptures, but other techniques above and beyond general literacy skills have to be brought to bear for effective comprehension in the scriptures.

An advisory committee, chaired by Arthur H. King, and including Don Norton, Frank Otto, Frank Santiago, C. Victor Bunderson, and Olivia Rojas contributed to the project. A pilot group in Mexico City was begun by Sandi Amend, a graduate student in the BYU Spanish department, during Spring term of 1977. This group was comprised of marginally literate women who had some basic phonics skills but who complained that they could not understand or remember anything they read (a common problem in a phonetic language). Sandi was successful in teaching this pilot group, and teachers were called and set apart by the Stake President to teach the course to members of the stake in each ward and branch in the Arbolillo Stake. Sandi then taught the lessons to these teachers who in turn taught them to their students. It is the experiences of the native teachers and their students that will be reported here.
A Description of the Lessons

The lessons were designed to mix strategy with content. That is, the principles of scriptural comprehension were taught using the first principles of the gospel as the content. Our belief was that the insight that would come from applying these comprehension principles to meaningful content would provide the greatest motivation for the students to continue reading. The lessons began by encouraging the students to apply the pattern of learning found in the scriptures: faith, study, and prayer in an atmosphere of love. The purpose and origin of the Book of Mormon were discussed, with particular stress on the beginning and ending parts of the book. The title page was examined in detail, as was Moroni 10, Moroni's parting message to those who hundreds of years later would read the book he sealed up. Particular emphasis was put on the Isaiah passage which is found at the end of the tenth chapter of Moroni: "And awake, and arise from the dust O Jerusalem, and put on thy beautiful garments O daughter of Zion, and strengthen thy stakes and enlarge thy borders forever, that thou mayest no more be confounded, that the covenants of the Eternal Father which he hath made unto thee, O House of Israel, may be fulfilled."  

We asked: What would it feel like to awake and arise from the dust? What does it feel like to put on beautiful garments? By getting at the feelings which figurative language is designed to elicit, we were able to get to a level of comprehension with these people that surprised us. The second lesson was designed to introduce them to the writers of the Book of Mormon. In keeping with the philosophy of the course of intermingling content and strategy, we taught them how to find references by showing them what the records meant to each one of the writers who kept them. We talked about how Nephi mined the ore, and smelted the ore, and formed the plates with his own hands. Nephi looked forward to the time when these plates would come forth and be a great blessing to those who read them. We read Jacob's words about the contents of these special plates and his poignant statement that they had been a lonesome and sorrowful people, that their days had passed as if it were a dream.

Enos, the son of Jacob, had taken the records and been concerned for their preservation. He pleaded with the Lord that the records would not fall into the hands of the Lamanites, but would be preserved and come forth at a later time to convert the seed of the Lamanites who were then trying to destroy the records. The lesson ends with the special meaning of the plates to the prophet Mormon. At age 10, he was told where to find the records. When he was age 14 he went to the hill Shim and took charge of them. At 15 Mormon saw the Lord and at 16 he lead the Nephite armies even though he knew the people were headed for sure destruction. As we
read Chapters 6 and 7 of Mormon, we felt the anguish that Mormon felt as he watched the people he loved being destroyed. He left an eloquent message to those who would read the records hundreds of years from that time. And then Mormon left the records to his son Moroni. Moroni wandered the earth alone, carrying the records, keeping charge of them, protecting them, adding to them, continuing his father's work until he sealed up the records in the Hill Cumorah. We read Moroni's final testimony and his plea for the House of Israel and all people to lay hold upon the spiritual gifts that always accompany the gospel of Jesus Christ on the earth. We talked about the feelings that Moroni must have had when some fourteen hundred years later he was permitted to show the young prophet Joseph Smith where the records had been hidden in the Hill Cumorah.

Having introduced the book and the writers, we next turned to the principles of comprehension. First we discussed the principle of repetition. Important ideas can be identified by what is repeated within a passage. Using the doctrinal principle of faith, we showed how repetition occurs in at least three forms in the scriptures: the repetition of exact words, the repetition of synonymous words and ideas, and repetition by example. We also taught the principle of asking questions to elicit comprehension, showing that comprehension is determined by the types of questions that are asked as one reads. Asking the questions, what is it? why is it important? what are its results? how do we obtain it? and what is an example? we discussed the principle of faith as it was defined in different parts of the Book or Mormon. We also made the point that in the scriptures no concept is ever explained in its entirety in any one place. It is as we find the different points of repetition throughout the scriptures that we come to understand the concept fully and completely. We learned that faith produced miracles, the visitation of angels, the way to hold on every good thing, and the way to become a son of God; that it comes by obedience, by repentance, by asking, and by working as hard as one can work. We examined the example of Nephi going back to obtain the plates from Laban and the example of the Brother of Jared, and asked what those two examples had in common. We asked what symbols were associated with the principle of faith and discovered that in Alma 32 the superlatives, purest, whitest, and sweetest were found and that these would take on an added meaning in another lesson.

The lesson on symbols explored Lehi's vision and Nephi's interpretation of that vision. We also taught students to look for associated words through the scriptures. We traced some of the major symbols through the scriptures. In particular, the fruit of the tree of life and the fountain of living waters represent the love of God and his mercy is commonly couched in these symbols.
We used the comprehension principle of contrast embedded in the doctrinal principle of repentance and drawing on repetition and question, explored Alma 36 and discovered the beautiful chiasmic structure of that chapter. We showed how an awareness of both structure and content gives the classic gestalt comprehension wherein the meaning of the whole is greater than the sum of the parts.

We showed how ideas relate to each other by exploring the concept of the atonement using the cross-referencing system and showing how the cross-referencing system operates upon the principles of repetition. We taught inference by the accumulation of imagery and using this principle showed how Isaiah passages could be understood. Throughout the lessons we stressed the need to put oneself in the lessons, that the scriptures contained patterns that answer personal problems. We used recall patterns to improve both comprehension and retention of what had been read. Recall patterns, instead of outlines, allowed us to capitalize on a type of thinking we called non-linear logic—an indefinable term that is best understood by contrasting it with our flow-chart logic.

Results

The results were measured by pre- and post-objective tests and pre- and post-questionnaires. We found that the results very much depended upon the teachers. One teacher started with twenty students and ended up with two. All of the other teachers kept between two-thirds and three-fourths of their students. Of 63 who took the pre-test, thirty-three students finished the lessons. In analyzing the results this group was divided into those who had a 6th grade or below education and those who had an 8th grade or above education. We had no one who had had a 7th grade education, so we simply eliminated that grade in classifying the educational levels. The students were given an objective pre- and post-test taken from Alma 5, each test covering 20 verses. Ten questions were asked on those 20 verses, giving a fairly comprehensive test of comprehension. The pre-to-post gain for the 6th and below group was 34 points. The gain for the 8th and above was 8 points, for an average of 24 points. However, it should be noted that when the tests were given to a Book of Mormon class at Brigham Young University the average score on the post-test was approximately 11 points lower than the average score on the pre-test and that the post-test results for the Mexican group would have been higher had the tests been comparable. The questionnaire results were positive. Out of several hundred total responses, fewer than ten were negative at all. A large number of students wanted to go through the course again. Many of them requested more lessons and said that they finally understood the scriptures for the first time.

Languages and Linguistics Symposium
While the objective test data and the questionnaire results were favorable, the insightful results were reflected in the anecdotal data. We were struck in the first lesson we taught with the reaction of those people to passages that we classically consider difficult, in particular the Isaiah passages. We also tend to struggle with some of the symbolic elements in the scriptures, and again we found that those people resonated to these concepts in a way that I personally have not seen in our Wasatch front culture. Let me first of all present several incidents we witnessed, and then attempt to analyze our experiences. When we taught the Isaiah lesson we were surprised that two of the women in our teacher's group wept uncontrollably. They were overcome with the power of those passages. I marveled at this because I had never seen it before and it was exactly contrary to what I would have predicted. When we observed the teachers teach, we saw the same thing. One student had difficulty reading because her voice was choked with emotion as she understood the scriptures for the first time; and again she was reading Isaiah passages. We sat in on another class where the teacher and the students wept openly and unashamedly. One mother told us that she had taught the Isaiah lesson to her children who were seven and nine years old, and that they had the same emotional reaction.

We saw similar reactions with the lesson on symbols. Before I went down to join Sandi in Mexico City, I met with everyone I felt could give me help in putting these lessons together. A colleague in the English Department had spent a considerable amount of time working out the idea that the Book of Mormon should be read as a figural narrative and that everything in the Book of Mormon could be tied back to Lehi's vision. I was excited by the power of this idea and decided to teach it in Mexico. Almost as soon as I got off the plane I tried to tell Sandi about the exciting new lesson I had brought with me. She interrupted and said, "Let me tell you what's happening first." She talked about a humble peasant woman who had been assigned by her bishop to read Lehi's vision and study it carefully. She had done this; it was the only part of the Book of Mormon that she had read with any comprehension. In every lesson that Sandi had given, this woman commented, "Why that ties back to Lehi's vision. That's just like ...." and she would go on and explain. I marveled again that something that a professor at Brigham Young University had struggled with had come so easily and naturally to a marginally educated woman.

The lesson on Isaiah and the lesson on symbols were two lessons that were accepted with greater ease of understanding than we could possibly have anticipated. I have pondered this since I have been back and in discussions with some of my friends and colleagues have posited the following explanations. The symbols and the figurative language used...
in the scriptures have an eternal verity that has not been dulled in the minds of those people by acquaintance with more superficial symbols; by humanistic approaches to ethics, literature, and religion; and by the habit of conceptualizing instead of experiencing gospel truths. These assertions are compatible with observations made there and here. The more educated the women there, the less their emotional responses to the lessons. These same lessons were taught to a BYU Book of Mormon class, and the responses were consistently more abstract and less precise than the post-test responses from the Mexican group. Of course, there are many possible explanations for these differences, and a more thorough analysis could be a major research effort.

Whatever the reason, it is apparent that in a culture where people are trying constantly to lose weight, and often drink Fresca and Coke instead of clear water, the filling and satisfying images of the bread and the fountain of living waters do not seem to carry the impact they carry with people who do not know from one day to the next whether or not they will have enough to eat. To people who have to send their children with donkeys to the water tank every morning for the water that will be used by the household that day, the image of cool, refreshing water gushing forth in a barren desert struck home. When Isaiah talks about feeding in high places, and mountains being exalted, and the Savior leading his children by fountains of clear, living water, the response is not intellectual, it is real and heartfelt. When they read the passage "Awake and arise from the dust, oh, Jerusalem, and put on thy beautiful garments, oh daughter of Zion," women who do not own beautiful clothes recalled vividly what it was like to put on a beautiful garment, an experience they had perhaps only once or twice in a lifetime. Again, the message struck home.

It did not take a very perceptive observer to see the scales of darkness literally fall from their minds, to see their eyes light up with a depth of understanding not witnessed by this observer before in an American culture and to sense their hunger for these life-giving, meaningful insights. This hunger was exemplified by one woman who had been in the church for eleven years but had never been able to understand the Book of Mormon. After the lessons she carried her Book of Mormon with her everywhere, even on the bus, looking up every cross reference she could find on the Holy Ghost.

These people experienced what they read. Their reading skills were deficient but their sensitivities and their experiences with life were not. Given meaningful content which spoke directly to such sensitivities and experiences these people were rather quickly moved to what we consider high levels of comprehension.
CLARITY VS. CHARACTER: ABAHAI'S ANTIDOTE
FOR THE COMPLEXITIES OF CHINESE

Stephen Durrant

Just as comic relief provides a needed counterpoint in serious drama, so should heavy and, dare I say it, ponderous conferences be supplied with some lighter moments. Lest I be accused of frivolity, let me say at the outset that this paper deals at least tangentially with that most serious reality at the modern American university—enrollment statistics. Contemplating our low enrollments in beginning Chinese, and, unwilling to admit that we teachers might be lackluster and unattractive, we have concluded that the reluctance of many students to enroll in our classes is largely based upon the widespread notion that Chinese is absurdly difficult. Although this notion marks some advance over the 19th Century idea that Chinese is not just absurdly difficult but absurd as well, it still casts a shadow over Chinese language programs and, more importantly of course, the economic security of modest Chinese language teachers. With this painful reality in mind, let us turn to an interesting and somewhat bizarre page in the history of Chinese language study.

Few Westerners have ever mastered Chinese as completely as some of the Catholic fathers who worked as missionaries in China throughout the 17th and 18th Centuries. While their descriptions of the Chinese language were usually in harmony with the generally romantic vision of China which they conveyed to the West, there were occasional complaints about the great difficulty of the language. For example, the Dominican Father Domingo Navarette proclaimed the Chinese language "doubtless the most difficult in the world." Elsewhere, he described his own study of this "most difficult" language as follows:

I came to the Church the 3d of November (1659), as I said above, and presently apply'd myself to the study of that dreadful and stupendious language; there are few but find great discouragement in it, I labour'd all I could. Mattins were always said at Midnight; and it was usual with me to sit in my Chair after them till Morning at my Study. Continual application overcame the difficulty in great measure.¹

While early statements about the difficulty of Chinese were balanced by positive appraisals such as John Webb's famous suggestion that Chinese was the original language of Adam, the descriptions that began to appear in the 19th Century were almost all negative. Let us begin our consideration of these descriptions of Chinese with two statements from the first years of the 19th Century. The first is from Lord Francis Jeffrey, a man who did not know Chinese but was one of the prominent British literary critics of his day, and the second is from Reverend William Milne, an early Protestant missionary in China who thoroughly learned the language.

First Lord Jeffrey:

There is no instance, we believe, on the face of the earth, of a language so extremely imperfect and inartificial; and it is difficult to conceive how any race of people could be so stupid, or so destitute of invention, as to leave it in such a state of poverty. . . . The structure of their written language shews that they are fully aware of the effects of combination; and yet they have in no instance introduced a compound word into their spoken language, or ventured to combine two syllables into the symbol of a complex idea. By what particular infatuation they have been withheld from so obvious an improvement—by what bar they have been obstructed from compounding their words as well as their written characters, we are utterly unable to comprehend, and no writer, we think, has attempted to explain. The fact, however, appears to be quite undeniable, that they have gone on for many thousand years pittering to each other in a jargon which resembles the chuckling of poultry more than the language of men, and have never yet had the sense to put their monosyllables together into articulate words.²

And now Reverend Milne:

To acquire the Chinese is a work for men with bodies of brass, lungs of steel, heads of oak, hands of spring-steel, eyes of eagles, hearts of apostles, memories of angels, and lives of Methuselahs! Still I make a little progress. I hope, if not to be master, yet to gain as much as will suit the purposes of a missionary. Every sentence gained I value at the rate of a dollar; so that should I gain 10,000, I shall not consider myself poor.³

²The Edinburgh Review, No. 10 (January, 1805), 280.
Just what were the unnatural features of Chinese which made it so ridiculous and unlearnable? There were three that 19th Century writers mentioned repeatedly. First, Chinese had no grammar and hence could not be rationally analyzed by the Western mind. Second, it was not only monosyllabic in structure but possessed such an impoverished sound system that communication even between native speakers was virtually impossible. And third, it had no alphabet but was written with a cumbrous script of enormous complexity and difficulty. Let us consider each of these flaws, giving ample credit to those who were able to expose them.

The study of Indo-European languages had ill-prepared early students of Chinese for a grammar lacking conjugations, declension and other such acoutrements of "civilized speech." Thus, Reverend William Medhurst, writing in 1838, noted that:

In the science of grammar, the Chinese have made no progress; and among the host of their literati, no one seems to have turned his attention to this subject. They have not learned to distinguish the parts of speech, or to define and designate case, gender, number, person, mood or tense; they neither decline their nouns, nor conjugate their verbs, while regimen and concord are with them based on no written rules... As for the distinction between noun, pronoun, verb, and participle, they have never thought of it; and use words occasionally in each of these forms, without any other change than that of position or intonation.4

It is indeed strange to accuse Chinese linguists of not discovering features in their language which it did not possess. But it was much worse than this, the perverse Chinese compounded the problem of an ambiguous grammar by writing without punctuation. Several years after Medhurst, Caleb Cushing wrote in the prominent journal Chinese Repository as follows:

Moreover, it is one consequence of the peculiar formation of the Chinese language that its words have no inflections, and that accordingly it has little or no


grammar. Inflection of number, time, and so forth, are designated by phrases. To denote the plural it is necessary to subjoin some word of plurality. And so, whether a word is to be understood as a noun-substantive, as a noun-adjective, as a verb, as an adverb, as a preposition, or as a conjunction, must in general be inferred or conjectured from the context or the order of the words; all which is the occasion of extreme obscurity and uncertainty in the spoken and written speech. The Chinese augment this obscurity by their own perverse rules of rhetoric and taste. With them, it is bad taste to divide a composition into paragraphs according to the sense and the argument; it is bad taste to employ conjunctive particles; nay, it is bad taste to employ punctuation. A page of paper is covered with words, none of which are invariable distinct parts of speech, but each of which may represent any or all the parts of speech. There is no punctuation. And the divisions of the words are not made to distinguish the sense by paragraphs, but in order to place a particular word of dignity at the top of the column, or for some other such puerile or fanciful purpose. And from this mass of words, thus intrinsically devoid of clearness and precision, and made thus studiously obscure, the meaning is to be extracted, by conjecturally supplying inflections, parts of speech, connective particles, points, paragraphs, and all the other ordinary means of precision and perspicuity.5

Truly, as Reverend John L. Nevins was to say later, "The Chinese seem to be our antipodes in almost everything."6

The second grave flaw of the Chinese language is alluded to in the statement of Lord Jeffrey quoted earlier: Chinese is composed exclusively of a limited number of monosyllables. John Barrow, a famous adventurer who accompanied the MacCartney mission to Peking in 1793, gives much space to this problem in his Travels in China, a book which enjoyed great popularity in the 19th Century:

The construction of the colloquial, or spoken language, is extremely simple. It admits of no inflexions of


termination, either in the verb, or in the noun, each word being the same invariable monosyllable in number, in gender, in case, in mood and in tense; and, as most of these monosyllables begin with a consonant and end with a vowel, except a few that terminate in l, n, or ng, the number of such sounds, or simple syllables, is very limited. To an European they do not exceed three hundred and fifty. But a Chinese, by early habit, has acquired greater power over the organs of speech, and so can modulate his voice as to give to the same monosyllable five or six distinct tones of sound; so that he can utter at least twelve or thirteen hundred radical words, which, with the compounds, are found fully sufficient for expressing all his wants.7

The miraculous ability of the Chinese to modulate his voice so as to produce tones could hardly be duplicated by a European, and hence embarrassment awaited the non-native speaker as Barrow clearly demonstrates:

This recurrence of the same words must necessarily cause great ambiguity in conversation, and it frequently indeed leads to ridiculous mistakes, especially by foreigners. Thus, a sober missionary, intending to pass the night at a peasant's house, asked, as he thought, for a mat, but was very much surprised on seeing his host presenting him with a young girl; these two objects, so very different from one another, being signified by two words whose pronunciations are not distinguishable, and consequently one or the other requires to be used with an adjunct.8

In his learned discourse cited earlier, Lord Jeffrey speaks of the problem of monosyllables:

This language consists of no more than 341 indeclinable monosyllables, which, by aspirations, accentuations, and other precarious devices, may be increased by a native Chinese to about 1300. This pitiful number of words constitutes the whole vocabulary of this enlightened empire! and such is the wretched penury of significant sounds, that every one of these monosyllables is computed to have about fifty different significations, insomuch, that their discourses are always full of ambiguity, and they are reduced to the most awkward contrivances to avoid the equivocations.9

8Ibid., 179, 180.
It is not the main purpose of this paper to refute these early misconceptions of the Chinese language. But it should be noted that the monosyllabic myth is still alive and well despite the brilliant attack on this position by George A. Kennedy.10 There remain those who attribute the non-development of science, logic, systematic philosophy and all those other civilized things the Chinese allegedly lack, to the idea that their language is so ambiguous as to block precise thought and clear communication.

What of the third flaw—the script? If one surmounts the grammarless ambiguity of the language, he must confront the nightmare described by another early traveller, Mrs. C. F. Gordon Cumming:

... though my ear for music is keen, I cannot distinguish Chinese sounds any more than those of Gaelic; nor can I conceive how any human eye and memory can recollect the thousands of combinations of little strokes, dots, and curves which must be mastered as the equivalent of our alphabet... There are said to be upwards of fifty thousand of these written characters, and a very learned man must know most of these—a task alike terrible to the sight and memory.11

According to Lord Jeffrey, who at least noted the presence of recurring character constituents, Mrs. Cumming's reference to fifty thousand characters was far too modest, He wrote that:

The eye soon becomes accustomed to fix upon the particular key or root, of the most complicated characters, in some of which are not fewer than sixty or seventy different lines and points. The right line, the curved line, and a point, are the rudiments of all the characters. These, variously combined with one another, have been extended from time to time, as occasion might require, to nearly eighty thousand different characters.12

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To set the record straight, the recently published Encyclopedic Dictionary of the Chinese Language (Chung-wen ta tz'u-tien), the most complete dictionary of Chinese yet published, contains 49,905 characters. Of these, there are none with seventy or more strokes. There are just one-hundred fifty-seven characters, less than one-quarter of one percent of the total, with more than thirty strokes, and there are more characters listed with twelve strokes than with any other number.

I would not want to underestimate the difficulty of learning written Chinese, but the early descriptions often did not make it sufficiently clear that the majority of the characters listed in a Chinese dictionary are no more frequent in that language than most words listed in Webster's Unabridged Dictionary would be in English. Reverend John Nevins was correct in noting that to read highly literary documents one needed from 5,000 to 7,000 characters.

Despite the enormous flaws of the poultrylike language of China, many writers perceived an antidote. This, of course, brings us to Abahai. It will be remembered that the last Chinese imperial dynasty, the Ch'ing dynasty (1664-1911), had been established and ruled by the Manchus, a non-Chinese people that had swept into China from the northeast during the mid-17th Century. Abahai (1592-1643) was the great military leader who brought the Manchus to the gates of Peking; he, more than any other man, was responsible for the foundation of the new dynasty. And during that new dynasty, the language of the conquerers was counted as one of the five official languages. 13

The Manchu language was radically different from that of China. It was an Altaic language with an alphabetic script adapted from Mongolian. As early as 1647, just three years after the fall of Peking, Father Gabriel de Magalhaes, a missionary in Szechwan Province, wrote that Manchu "letters and much more their language are easy to learn . . ." 14

Quickly Westerners in China developed an infatuation with Manchu, for they discovered that it had many of those admirable features perplexingly absent in Chinese. Father

13 Along with Chinese, Tibetan, Mongolian and Uighur.

Amiot noted that "the Manchu language is after the style of European languages; it has its methods and its rules; briefly speaking, one sees one's way clearly,"\textsuperscript{15} One 19th Century writer urged Western nations to adopt Manchu as the official language of communication with China, and he listed its advantages over Chinese as follows:

1. It is an alphabetic language . . .

2. The alphabet is remarkable for its beauty and simplicity; and it is more easily written, as well as read, than any of the alphabets employed in Europe.

3. Manchu has all the regular parts of speech; noun-substantive; noun-adjective; pronouns, personal, possessive, demonstrative; verbs, with conjugations, modes, tenses and participles; adverbs; prepositions; conjunctions, and interjections.

4. In acquiring the Manchu language, one finds, with pleasure, that the adjectives, as in English, are indeclinable, and that only gender is the natural one . . .

5. The conjugations of the verbs are for the most part regular . . .\textsuperscript{16}

John Barrow cited some of the same advantages of Manchu and added one other. "In the enunciation it is full, sonorous, and far from being disagreeable; more like the Greek than any of the oriental languages; and it abounds with all those letters which the Chinese have rejected, particularly with the letters B and R."\textsuperscript{17}

What greater compliment could be paid any language--almost like Greek! Plainly this was a language onto which the West could pin its hopes. Thus, Barrow predicted that if the Manchus stayed "on the throne a century longer," their language would "in all probability, supplant the Chinese."\textsuperscript{18}

To be exact, the Manchus remained on the throne for 106 years after the publication of this remark, and by that

\textsuperscript{15} Eloge de la Ville de Moukden, (Paris, 1770), VI.


\textsuperscript{17} \textit{Op. cit.}, 182.

\textsuperscript{18} \textit{Ibid.}
time, thoroughly sinicized, very few of them could speak their native tongue. The unhappy trend away from Manchu had been seen and sternly condemned several decades before the fall by H. E. M. James:

The successive emperors of the Manchu dynasty have taken care to have every Chinese book of value translated into Manchu, and valuable dictionaries and other elementary works have been compiled in Manchu and Chinese. Yet, so wonderful are the ways of men, the Court and the people alike are now abandoning Manchu for the cumbrous and barbarous Chinese. If they had imposed their language rather than their pigtails on their conquered foes, how much better it would have been.19

Yes, how much better it would have been for all of us! Reassured by grammar, an alphabet, polysyllabic words and B and R to boot, students would have been flocking to Manchu 101. Unfortunately, Abahai's antidote did not take, and we are left, if we wish to communicate with 800,000,000 of our fellowpersons, approximately one in four of the earth's inhabitants, with the wrenching job of mastering the monosyllabic grammarless Chinese chuckle while Father Navarette's words still echo in our brains, "that dreadful stupendious language; there are few but find great discouragement in it."

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WH- WORDS FROM A JAKOBSONIAN POINT OF VIEW

Robert Fugal

Scientific analysis has led the way to the discovery of many important abstractions. Starlight analysis has led to the discovery of quasars and galaxies. Physics analysis has led to the discovery of the theory of relativity. Biochemical analysis has led to the discovery of DNA. The list could go on, but the point here is that analysis is a proven method of learning truth, a practical means of discovering intangible realities.

For a long time biochemists tried to figure out what made chromosomes. By analysis, they discovered that chromosomes were made of genes and genes of proteins. By noticing the similar way each protein reacted in identical chemical environments they discovered a common invariant atomic structure possessed by each of the proteins. Because each protein had the common structure, each was classified as an amino acid. You can see the structural diagram of six of these amino acids in figure one. Each structural diagram represents the invariant structure of each of the proteins shown, and the circled part is the common invariant structure. The common invariant causes the acids to react in similar ways in different chemical environments. However, by noticing the slightly different way the different proteins react in identical chemical environments, the chemists discovered marked differences among the various acids. They also found that the marked difference or the unique part of each acid caused the acid to respond in some unique and predictable ways in different chemical environments. This predictability then helped them discover the structure of the highly complex molecule, DNA, (See figure two) and thereby explain many heretofore mysteries of genetic inheritance. The work is not complete, and much money and manpower are still spent on biochemical analysis.

One success story breeds hope of another. Roman Jakobson, famous for his work in phonology, successfully analyzed the Russian case system. As he did so, he discovered some very abstract semantic distinctive features that defined the invariant meaning of the Russian cases. These features, comparable to the organic elements that make up amino acids, seem to be universal building blocks of meaning; by combining in different ways, they define the essential, abstract and invariant meaning of each lexical and grammatical unit of a language. As much as biochemical analysis, Jakobsonian semantic analysis merits the attention of researchers and scholars. Jakobson has provided many keen insights into language which, if researched and developed, could lead to discoveries as important to linguistics as DNA is to genetics.

Languages and Linguistics Symposium 1978
Amino Acids

Phenylalanine (Phe)

Tyrosine (Tyr)

Tryptophan (Trp)

Lysine (Lys)

Arginine (Arg)

Histidine (His)

Common Invariant

Figure 1.

Sketch of DNA

Figure 2.

1978 Languages and Linguistics Symposium
Jakobson has said "... the most difficult part in the study of words is the lexicon. Linguistics is now trying, step by step, to classify lexical units."¹ This paper attempts to take one small, exploratory step toward classifying lexical units according to Jakobson's theory of language. Two major goals of the paper are, first, to show the common invariant meaning of the words what, which, who, when, where, and why and, second, to demonstrate the invariant meaning of each of them. Before doing so, however, it is necessary to explain a few important concepts from the Jakobsonian point of view.

According to Jakobson, "language is not a set of ready made sentences, but rather a system of signs."² (Figure three.) Unlike many linguists, Jakobson believes that the linguistic sign is a "necessary, dependent, indissoluble duality, a combination of a signans and a signatum."³ The signans, or form, is the physical speech sound that carries the signatum (meaning) or translatable, intelligible essence of speech. In other words, form is the embodiment of the knowable but intangible meaning, which cannot be separated from the form. Jakobson is amused by American linguists who try to study form without meaning. He compares such studies to physiologists studying the behavior of a chicken without a head. He feels that it would be as great a mistake to assume that it is normal for form to be without meaning as it would be to assume that a chicken is normal without its head.⁴ He maintains that "no form exists without some meaningful function to fulfill ... and that] formal differences are always meaningful."⁵

A major consequence of this conception of language and more particularly the notion of the linguistic sign is the principle of invariance. Jakobson says, "The question of the variants leads to the greatest problem in linguistics: the problem of invariants. There always has to be a common denominator ..."⁶ He also says,

³Waugh, Roman, p. 36.
⁴Van Ballaer, p. 46.
⁵Waugh, Roman, p. 43.
"Language is a system of signs."

\[
s = \text{sign} \\
ss = \text{sub system}
\]
One the level of words there is always meaning. But has a word one meaning or a number of meanings? The distinction has to be made between homonyms, words with really different meanings, and families of words where it is clear that there is one basic meaning with, furthermore, a high number of partial, contextual, meanings. The important question in such a case is, 'what is the invariant?'

In short, the principle of invariance means that for every linguistic form, there is only one real and invariant meaning, regardless of how many different referents or contextual variants the form may have.

Linguistic forms may have many contextual variants because "meaning is a classification, a categorization imposed by language or extralinguistic reality." Because meaning classifies extralinguistic reality, it is natural for some meaningful forms to be able to classify, or include in their categorization, many different items from the world of experience. Each different item categorized or referred to by a linguistic sign is only a contextual variant, not a different meaning. Thus, a distinction must be made between meaning and reference. "Jakobson has always contended . . . that meaning is to be constantly and rigorously separated from its support—reference (denotatum) or ontological reality." Jakobson supports his argument by citing examples of meaning that does exist without reference. For example, "ambrosia" and "unicorn" and "quarks," while they may not have a real referent are translatable and meaningful. He summarizes "in general, the symbol cannot indicate any particular thing; it denotes a kind of thing." Therefore, the linguistic sign has a form inseparably linked to one invariant meaning which classifies a "kind of thing" rather than any "particular thing." Many particular things classified under one sign give rise to the contextual variants of that sign. Poets, scientists, inventors, advertizers, college students, slang users, etc. constantly use established linguistic signs to categorize new feelings, discoveries, gadg-

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7 Van Ballaer, p. 31.
ets, products, complaints, people, etc. Consequently, contextual variants become infinite. Amazingly, some linguists take on the impossible task of listing all the contextual variants of a sign. A more productive goal is to find the invariant meaning of the sign, the linguistic basis of classification that permits poets and others to use signs in novel contexts and still communicate. (The author feels that a poet's genius is an intuitive knowledge of what a sign can and cannot categorize and which sign best categorizes the subject at hand. Consequently, poetic language, especially metaphor, often demonstrates most vividly the real invariant meaning of a sign.)

Another important Jakobsonian concept is that of the "code." Linda Waugh characterizes the "code" as follows:

In terms of the semiotic non-material nature of the whole, we have the antinomy and means-end relation between code and message, where message is defined by Jakobson as the unique, semelfactive, single act of speech, while the code is the system . . . which underlies and makes possible that and every other message. Code then, is not a material entity but rather a semiotic one.

The code is made up of many different sub-codes. At one level of sub-codes, the linguistic sign is the main constituent. (Figure three is a graphic representation of a very small portion of the code.) At this level, the meaning of the sign is given in relation to the meanings of the other signs of that particular sub-code, similar to the way an amino acid is analyzed and characterized by its relationship to other amino acids. For example, the meanings of the different tense forms can be known only in relation to each other. One cannot know the meaning of past tense forms without knowing the meaning of present tense forms and future tense forms. Similarly, one cannot know the complete meaning of what without knowing the meaning of which, who, when, where, and why.

The difference between code and message creates a "dialectic tension" known as deixis.

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11 Van Baller, p. 33.
12 Waugh, Roman, p. 18.
13 Waugh, Roman, p. 20.
In deictic categories or deictic features, the extralinguistic reality embraces the speech situation, and so the classification or categorization necessarily includes the speech situation itself. Thus, in the definition of deictic units or features or processes, the speech situation must be taken into account. By this definition, I, you, today, now, here, this, come, etc. are all deictic. Any category which presupposes a given linguistic context is necessarily deictic, for the speech situation is a necessary part of its definition.14

The wh- words are deictic because they presuppose or depend upon a given linguistic context. They derive their meaning by pointing to antecedents in the message and to referents in extralinguistic reality.

The last important definition is that of the distinction between the terms "marked" and "unmarked."

In semantics, MARKED [+ feature X] refers to the necessary presence of the information given by the feature in all the contexts in all the uses of the particular item. In other words, the item must invariantly carry whatever unit of information is given by the feature. UNMARKED [Ø feature X] means that the information given by feature X is not necessarily present in all the contexts where the unmarked form occurs. It means either presence or absence of that particular piece of information given by X.15

The following analysis attempts to describe the common semantic features of what, which, who, when, where, and why and each of their correlations in the linguistic code, thereby contributing to the knowledge of lexical units in English.

As suggested by their name, wh- words are somewhat related in form. Their phonemic representations, /hwət/, /hwɪʃ/, /hu/, /hwen/, /hwer/, hwi/, show that each form starts with the sound /h/ followed by a rounded semi-vowel or vowel. This similarity in form is likely to indicate some similarity in meaning.

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In fact, they are very similar in meaning. As mentioned above, the wh- words are all deictic: they all point to some referent in their context. When a speaker says, "What are you doing?" the hearer cannot know the meaning of "what" without knowing the linguistic context "are you doing." The referent of "what" includes some sign of group of signs in the message of which it is a part, i.e. "wayt" refers to its answer (the sign /swimin/ or whatever) and indirectly to the referent of the answer (the real act of swimming). "What" and the other wh- words are deictic because they presuppose their own linguistic context and thus the speech situation is a necessary part of their definition. Transformationalists show that wh- words refer to other parts of the context by showing the referent in the deep structure when the wh- word is a relative, e.g. the boy (the boy broke his shin) cried loudly and by showing "something" as the referent when the wh- word is an interrogative or indefinite.

Another meaning that seems to be common to all these words is that they are marked for one of Jakobson's semantic distinctive features, dimensionality. In other words, each of them categorizes a referent that has limits, bounds, or dimensions, or each imposes limits, bounds, or dimensions on its referent. When a speaker says, "What are you doing?" the hearer knows that he is requested to describe the limits of or type of activity. He may answer "Just eating" and thereby define the limits of his activity. His activity does not extend across the boundary into other activities such as running, jumping, etc.

Wh- words also are marked for objectiveness: in the mind of the speaker/hearer they bring their referents into an existence independent from all other parts of ontological reality. When a speaker says "What have you done?" the word "what" refers to the hearer's past action and singles it out or gives it an independent existence in the mind of the hearer. Objectiveness makes wh- words especially appropriate for interrogatives because the wh- words tell the hearer to bring the referent (answer) into an independent existence so that it may be examined.

Sentences A through R show that what, which, who, when, where, and why all are marked at least for deixis, dimensionality and objectiveness.

A. What did you say?* Nothing.
B. What do you think of my new dress?
C. Joe wanted to know what was the matter.

*Taken from the Oxford English Dictionary.
D. Which way shall I go? To the left.
E. They conformed to the rules, observing the spirit rather than the letter of the law. Which was just as well.*
F. Can you remember the store which was by Joe's house?
G. Who said that? The Democrats.
H. The boy who broke his shin cried and cried.
I. Sally told who her boyfriend was.
J. When did you get there? At 5:00.
K. I can't remember when I last saw a movie.
L. At 5:00 when I get off work I'm going to the bakery.
M. Where did you come from? Heaven.
N. He didn't say where he was going.
O. I'm going back to the place where I came from.
P. Why do you keep poking me? Because I like to.
Q. I don't know why she swallowed that fly.
R. She refused to tell me the reason why she couldn't come.

"What" in sentence A refers to the sign "Nothing" and is, therefore, deictic. "What" requests an independent answer limited in number of signs whose referent is also limited and independent. An endless string of signs with an infinite meaning would be an inappropriate answer. The referent of "nothing" is limited: it is bounded on all sides by something, and furthermore, the referent of "nothing" exists all by itself, independent of all things. If the answer were "You're up a creek without a paddle" it also would be limited in number of signs and in referent, and the limited number of signs, like the limited referent, would have an independent existence. Because "what" limits or bounds its referent, it has dimensionality. Because "what" requests that its referent be brought into an independent existence, it has objectiveness. Item B is so similar to A that it need not be discussed at length, but it is interesting to that the questioner obviously is not asking for an infinite listing of everything the responder thinks about the dress, only a limited, independent reply. In item C Joe wanted to know the limited problem which existed independently outside of his knowledge, the limited knowledge of a problem that existed independent of other problems in someone else's mind. Item D, like A and B, uses "which" to refer to the limited answer with an independent existence. In item E deixis, dimensionality, and objectiveness become quite apparent. The referent of "which" is the entire preceding sentence, which in turn refers to the limited reality "they conform to the rules, observing the spirit rather than the letter of the law." The "which" separates the conformity from all other reality in the mind of both the speaker and hearer. The "which" in item F refers to "store," which obviously is limited and exists independently.
"Who" in item G, "when" in J, "where" in M and "why" in P are like A, B and D in that they presuppose an answer in their linguistic context--they are deictic. They also enforce dimensionality and objectiveness upon both their answers and the referents of their answers. Each answer is made of a finite number of signs. The referent of "the democrats" is a limited number of people that as democrats are distinct, separate or independent of all other reality. The referent of "at 5:00" is a limited portion of time separate from all other reality. "Heaven" is a place that exists separate from the world and is bounded in that it does not cross the border into earthly things. "because I like to" is an independent and limited reason for "poking me."

The "who" in item H refers to the boy, who obviously has bounds and limits and is singled out from the rest of reality. "When" in L refers to the limited and independent time "5:00 p.m." In O "where" refers to "the place" which is limited and set apart from the rest of reality by the phrase "where I came from." "Why" in item R refers to a limited and independent reason for the girl not to come. "Who" in item I refers to the name or description of Sally's boyfriend. Sally would be the first to admit that he is limited in form and exists in her mind completely independent of all else. "When" in sentence K refers to the single independent time that "I last saw a movie." Item N shows that "where" refers to a limited and independent place that "he" was going. The "why" in Q refers to the unique and limited reason that made her "swallow that fly."

Further examination of the contextual variants of each of the wh- words supports the existence of the common invariant described above and also illustrates the unique invariant structure of each word thereby showing the relationships that exist among them.

The major contextual variants of "what" are its use as an interrogative, an indefinite, an exclamatory, and other uses. Following are several contextual variants of "what" used in these categories.

Interrogative 1. What are these wounds in thine hands?*
Then shall he answer them, Those with which I was wounded in the house of my friends.
2. What are the technical words . . . ?*
3. You noticed that young man, sir, in at Darby's. Yes. What is he. Deserter, sir.*
4. What on earth is that?
5. What did you do that for?
6. What time is it?
7. If Tom dies, what then?
8. What child is this?
9. What did you say?*

Indefinite
10. Milton means what he says.*
11. You may have half a dozen legs for what I know, as it is difficult to discover any under the petticoats you wear.*
12. They changed what they could*
14. There are few madmen but what are observed to be afraid of the strait waistcoat.*
15. I will take what indulgence the ... reader will give me.*

Exclamatory and Other
16. What a lovely day
17. Daddy, I've decided to marry Joe. "What "
18. What with hunting, fishing, canoe making and bad weather, the progress of the august travellers was so slow.*
19. My lady will know the what and the why.*

In sentence 1 "what" refers to "wounds." Since the referent is a part of the question, the question almost seems pointless. But it is not pointless because "what" requests that further but limited explanation about the wounds be given an independent existence. Notice the type of referent that is bounded or limited by the word "what" in sentences 2 through 9: Sentence 2, some technical words; Sentence 3, "deserter"; Sentence 4, some unnamed object; Sentence 5, a reason; Sentence 6, a specific time; Sentence 7, the probably result of Tom's death; Sentence 8, a child; Sentence 9, a message. "What" in sentence 10 refers to the form and meaning of Milton's words. "What" in sentence 11 refers to the limited knowledge of the speaker. In sentence 12 it refers to the limited and independent things that "they" could change. Sentence 13 says that John has the ability to discern the bounds and true limits of things in extralinguistic reality and to give them an independent existence: he can match the limited meaning of signs with their limited referents. The "what" in sentence 14 refers to a limited group, madmen, and their specific fear of the strait waistcoat. One way to think of it is to imagine the word "what" drawing a line around the madmen and calling attention to the fact that there are just a few of them. In sentence 15, "what" refers to specific or limited quantity of indulgence that the reader will give to the speaker.

"What" as an exclamatory really shows its objectiveness and dimensionality. In sentence 16, the "what" refers to the lovely day which has bounds and limits just as do the words "a lovely day." The exclamation singles a day out for special recognition. The "what" in sentence 17 works just like "what" in sentence 16 only more intensely. Sentence 18 refers to the progress of the travellers and the reasons why it was so slow. It would be impossible to list every reason
because they may be infinite, so the speaker uses "what" to delimit or bound all of the reasons aside from the ones mentioned, and then adds to them the major reasons of hunting, fishing, etc. Sentence 19 shows the use of "what" as a sign of itself. In other words, the referent of "what" is the word "what." Although there could be an infinite listing of contextual variants of the word "what," it can be seen from those listed above that "what" is always deictic and it always limits, bounds or circumscribes some portion of extralinguistic reality and gives it an independent existence.

"Which" is like "what" in that it has deixis, dimensionality and objectiveness. But it is different from "what" in that it is marked for a deictic objectiveness, which is more specific than regular objectiveness. It separates a referent from other referents of the same class. Thus, the word "which" takes a portion of extralinguistic reality, bounds it, gives it a special, independent existence, and then separates its referent from other referents of the same class or group. Note these qualities in the following sentences.

Interrogative 20. When the question is asked, Was Jesus the Messiah?" the obvious reply is, "Which Messiah?"*
  21. Which is Julie?
  22. But which is it to be? Fight or make friends?*

Indefinite 23. I have an assignment due today, but I've forgotten which.
  24. I can't tell which is which.
  25. When, which happened every day, they forgot their disguises for awhile, they talked quite freely.*

Relative 26. Let us suppose that there is a town which is able to support two banks.*
  27. His mother had ten children, of which he was the oldest.*
  28. He is on the high road to get all the men for which he has asked.*
  29. These were works which, though I often inspected, I did not accurately study.*
  30. The monuments spoken of in the second part of the following poem, which monuments do now exist as I have there described them.*

In sentence 20, "which" implies that of the many Messiahs that have existed, which one was the independent being named Jesus. In sentence 21, the speaker wants to know of all the persons which one is named Julie or which one is the independent person names Julie. Sentence 22 uses "which" to refer to one of two courses of action. Whichever one is to
be will be independent of the other. In sentence 23, "which" refers to the particular assignment independent of all other assignments that is due today. In sentence 24, the "I" has an inability to distinguish one independent referent from another. In sentence 25, "which" refers to the specific and independent action of "they" who forgot their disguises. In sentence 26, of all the towns that exist, the speaker is supposing an independent one that is able to support two banks. Sentence 27 and 28 each use the word "which" to separate people from the entire set of people. Sentence 29 uses "which" to separate all works from those that the speaker often inspected but did not accurately study. In sentence 30, "which" refers to the independent monuments as described by the speaker.

"Who" is like "what" and "which" in that it is marked for deixis, dimensionality and objectiveness. Like "which," it also has deixis and objectiveness, but in addition to these markings, "who" is also marked for deictic duplication, i.e. a copying of some of the speaker's characteristics into the referent's. When a speaker uses the word "who," he indicates that there is a duplication or a similarity of some of his qualities in the referent of the word "who." For example, a person speaking of another person uses the word "who" because he considers the other person to be a person. If a boat is speaking to another boat, it uses the word "who" because the other boat has qualities similar to its own. If a person speaks of a cat in terms of "who," he considers the cat to have certain person-like qualities. These features can be seen in the following contextual variants of the word "who."

### Interrogative
31. Who is my mother?
32. And who--who does she say dared to commit this outrage?*
33. Who on earth made that mess?

### Indefinite
34. When I look at the twins, I can't tell who is who.
35. Let's take a trip to the land of marriage and see who and who are together.*
36. John, Bill, and I don't know who all left early last night.

### Relative
37. My friend Bill, who has red hair, is lazy.
38. The man who has red hair is lazy.
39. The winds, who think they rule the mariner, are ruled by him.*
40. Even the lowest creature who floats on the pool's surface feels some half-conscious pleasure in the mere act of living.*

### Substantive
41. It wasn't a what, it was a who.*
In sentence 31, obviously the speaker has some of his mother's traits. Sentences 32 through 38 all use "who" to refer to persons and all are spoken by persons. Both the speakers and the referents have the quality "personality" in common. In sentence 39, a person is talking about a thing, the winds. However, the person attributes the person-like characteristic of ruling and being ruled to the winds. Therefore, there is a deictic duplication of qualities of the speaker in the referent. The same type of duplication occurs in sentence 30. Although the speaker certainly does not consider the lowest creature who floats on the pool's surface to be a human, he does consider that they have a human characteristic, that is, "some half-conscious pleasure in the mere act of living." Sentence 41 makes an interesting distinction between a "what" and a "who." The "what" is unmarked for the duplication that "who" has.

At this point it is interesting to investigate the relationships among "what," "who," and "which." The difference between "what" and "which" is that "which" separates its referent from a class of similar referents while "what" separates its referent from all of reality. The difference between "which" and "who" is that "who" copies some of the features of the speaker into its referent while "which" does not. This relationship is shown in the following diagrams.

Because "what" is unmarked for objectiveness and duplication, it simply makes no comment as to whether or not its referent has those features. Consequently, it can and often does refer to items with those features in extralinguistic reality. For example, in the question "what box are you going to take?" "what" refers to a particular independent
box that is going to be taken. In the question "what girl are you going to take out?" "what" refers to "girl," which has deictic objectiveness and deictic duplication. Likewise, "which" can refer to items in the extralinguistic reality that have deictic duplication, for example, "which boy won the prize?" However, "who" cannot refer to things that do not have deictic duplication. For example, one cannot say, "the couch who is in the corner" without indicating that the couch has something in common with the speaker. Similarly, "which" cannot be used in a sentence without deictically "objectifying" its referent and "what" cannot be used in a sentence without delimiting the boundaries of the referent.

Minimal pairs help be demonstrate these relationships.

Interrogative  
42. What/which/who came?  
43. What/which/who made the noise?  
44. What/which/who is behind the door?  
45. What/which/who is sitting there on the table?

Indefinite  
46. What/which/who steals my purse steals trash.

Relative  
47. I know what/which/who you want.

48. My friend what/which/who is a Mormon is nice.

49. Our Father what/which/who are in heaven.

50. He is a linguist what/which/who gives me the right to say that.

Substantive  
51. He can't tell a what from a who or a which.

The possibilities of the referent of "what," "which," and "who" in sentence 42 are different. When one says "what came?" the speaker only knows that some limited, independent referent came. But if someone says "which came?" he must know the class of possibilities and is attempting to find out the independent one that did arrive. When one says "who came?" he knows that the referent of "who" has some qualities similar to his own. If one hears a noise and asks "what made the noise?" he does not know or imply that whatever made the noise is any particular thing or has any qualities like himself. But, if one asks "which made the noise?" he knows a class of things that could have made the noise and is trying to isolate the particular thing that made the noise. If one asks "who made the noise?" he knows that someone like himself made the noise. The same relationships hold true for the sentence in numbers 44 through 51.

It is interesting to note that if a person is sitting on the table and one asks "What is sitting there on the table," the person on the table becomes offended because the
speaker fails to indicate that the person sitting on the table has the qualities of a person. If the speaker asks "Which is sitting on the table," his emphasis is on discerning which person of the many possible persons that could sit on the table is really sitting there.

Another interesting situation is that indicated in number 50. The use of "what" can readily be eliminated because there is no referent in the sentence that is sufficiently unmarked for "what." However, either "which" or "who" could possibly fit in the sentence. If a person says "He is a linguist which gives me the right to say that," the referent of "which" can be either the fact that he is a linguist or the linguist himself as opposed to another linguist. In the first instance, "which" delimits or sets bounds for the fact that he is a linguist and objectifies or isolates that fact from the other facts for the hearer's consideration. In the second instance, the word "which" objectifies or isolates the linguist himself from all other linguists. If a person says "He is a linguist who gives me the right to say that," the only referent of "who" in the sentence is "linguist" because "linguist" is the only referent in the sentence that has some qualities of the speaker.

The situation presented in 49 is similar to that of 50. "What" can be readily eliminated because it is not sufficiently marked for the referents in the sentence. If a person says "Our Father which art in heaven," he objectifies or singles out the Father in heaven as opposed to the one of earth. But, if a person says "our Father who art in heaven," he not only specifies the one in heaven but also indicates that the referent has some person-like attributes. Sentence 51 indicates that "he" cannot distinguish a referent without deictic duplication or deictic objectiveness from referents marked for those features.

"When" is like "what," "which," and "who" in that it is marked for deixis, dimensionality, and objectiveness, but it is different from all of them in that it is marked for transitivity also, i.e. "when" indicates a close contact between its referent and its predicate. (In this respect, "when" is much like the preposition "on" which indicates the close contact between its object and its modifier.) For example, in the sentence "She came when he left" "when" indicates a contact between the two actions. In the sentence "I'll go when I'm called" the "when" indicates contact, transitivity or simultaneity of the two actions. In "at noon, when the buzzer rings, you are dismissed," "when" puts its predicate, "the buzzer rings," in contact with its referent, "noon." One way to imagine this transitivity is to imagine that the two actions share the same border. Notice the transitivity or contact indicated by "when" in the following variants.
Interrogative 52. When is a horse like a herring? --When he's hard rode.*
53. When should I come visit you, Mr. Adams? At 5:00.
54. Since when is it, good Father, that the principle libertine has altered his morals so much?* Since Pope Paul passed away.

Indefinite 55. You'll know when to turn once you get there.
56. I hope to see my Pilot face to face When I have crossed the bar.*
57. I was a grown young man of twenty by when it happened.*

Relative 58. There are times when an example is needed.
59. It was midnight when I finished my paper.

Conjunction 60. When great national interests are at stake, the party system breaks down.
61. What's the good of my pretending to stand out, when I can't help myself?*

Substantive 62. I have very little reason to doubt about the issue of things, but the when and the how are known to him.*

In each of the above sentences "when" links its predicate with its referent: in 52, "the horse is hard rode" is linked with "the horse is like a herring"; in 53, "at 5:00" contacts "I should come visit you, Mr. Adams"; in 54, "the principal libertine alters his morals" contacts "since Pope Paul passed away"; in 55, "you get there" is contiguous with "you'll know to turn"; in 56, "I have crossed the bar" is linked with "I hope to see my Pilot"; in 57 "it happened" is linked with "I was a grown young man"; in 58, "an example is needed" borders with "there are times"; in 59, "I finished my paper" is linked with "midnight"; in 60, "great national interests are at stake" co-occurs with "the party system breaks down"; in 61, "I can't help myself" is linked with the situation "my pretending to stand out"; in 62, the "issue of things" is linked with the word "when."

"Where" is like the other wh- words except that it is marked for restrictiveness, i.e. the referent of "where" shows the periphery of the predicate of "where." Notice the restrictedness in the following contextual variants.

Interrogative 63. Where the deuce am I?*
64. Spencer, where have you been?
65. I must go suddenly, but where to?*
66. And where is Emma's joy if Henry flies?*

Indefinite 67. You come from no one knows where.*
68. Let's go where we can get a better view.
69. I'll stay where I am.
Relative  70. I hastened to the black hole where Tom was confined.*
71. Looking for all the world like some great dog that has entered a house where dogs are forbidden.*
72. I discovered the place where I made the mistake.

Connective  73. Where Powell parted company most fiercely from the Radicals was in his steadfast patriotism.*
74. They are rude where they should be reverent.*

Substantive  75. He got victuals enough one where or another.*
76. In this heaven there is no other where Than in the Mind Divine.*

In the interrogative uses "where" requests a knowledge of the peripheral setting that focuses in on the predicate of "where." In the indefinite uses, "where" functions in the same way. For example, in 68 the peripheral setting focuses in on the predicate "we can get a better view." Restrictedness is most easily seen in the relative uses of "where." In 70 "the black hole" describes the periphery that is then focused by "where" to the predicate "Tom was confined." The predicates focus or restrict each other when "where" is used as a connective as is shown in 73 and 74. The "where" in 76 refers to a very general setting that is focused in or restricted to "the Mind Divine."

Why" is like the other wh- words in that is is marked for deixis, dimensionality and objectiveness, but it is also marked for transitivity and restrictedness. This can be seen in the following contextual variants.

Interrogative  77. Why was Pul thus marked for vengeance from the beginning?*
78. Why don't you take up Greek?
79. The poor live pleasantly without our help, why then should we not learn to live without theirs?*
80. Why books, why chapters, why titles, why any arrangement at all, they queried.*

Indefinite  81. It is easy to explain why the Roman Catholic was treated with less indulgence.*

Relative  82. We can perceive the reason why a small proportion of carbonic oxide is always formed during the decomposition of nitre by charcoal.*
83. It would be useless to deny that your life is in grave danger . . . But that is no reason why you should surrender it without a struggle.*
Substantive 84. But the Why? The final causes, the moral consequences, and the particular detail, is only here conjectured about.*

85. The reader who may not be acquainted with the when, and the why and the how of the surrender.*

In each of the above sentences, "why" refers to an independent, limited, peripheral setting that is put in contact with the effect or predicate.

If the above analysis is correct, each of the wh-words, like each amino acid, shares a common invariant meaning composed of the semantic distinctive features deixis, dimensionality and objectiveness. Also, each wh-word has its own invariant meaning as shown below:

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<thead>
<tr>
<th>What</th>
<th>Which</th>
<th>Who</th>
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<tr>
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<td>+ deixis</td>
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</tr>
<tr>
<td>+ dimensionality</td>
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<td>Ø deictic</td>
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<tr>
<td>duplication</td>
<td>Ø transitivity</td>
<td>+ transitivity</td>
</tr>
<tr>
<td>Ø restrictedness</td>
<td>+ restrictedness</td>
<td>+ restrictedness</td>
</tr>
</tbody>
</table>

If common invariants and invariant meanings can be found for wh-words, they also can be found, maybe with much effort, for other signs in the code. If other signs in the code do have invariant meanings, they can be listed only once in the lexicon. Also, they can be understood perfectly in new contexts. Further studies, more rigorous than this one, should be made to see if the above analysis is true and if invariant meanings really can be found for all of the signs in the linguistic code.
BIBLIOGRAPHY


PROBLEMS IN SUBJUNCTION

Mike McOmber.

Let us take a group of 9 people. (Figure 1.) Three of them are boys, three are girls, two are men, and one is a woman. Their individual names will be the numbers as shown in the diagram. To say, for example, that 3 is a boy, classifies 3. These classes are called sets, and are shown in Figure 2. A notation for these sets is also shown (Figure 3). The number of items in a set is called the scope of the sets. The scope of B is 3, the scope of G is also 3, M is 2 and W is 1.

Let us make a further classification of these 9 people. Let us say that 2, 3, 6, and 8 are sick. We will call this set S (figure 4). The people excluded from this set are not sick. We will call this exclusion set "bar S" \( \overline{S} \), meaning "not sick". (Figure 5.)

We can put a similar bar over any of the other set labels and get the sets in Figure 6.

Another set (Figure 7) can be made by combining two of the other sets, such as making a set of children, set C, which is composed of the set of boys, together with the set of girls (Figure 8). This combination of sets is called a "union" and the symbol for it is a small \( U \). Similarly, we can make a set A of adults (Figure 9), men and women.

Now let us take two sets, set B and set S, and represent them as streets. The members of the sets are people standing in the street (Figure 10). You see that 2 and 3 are in both streets—they are in the intersection (Figure 11). In set theory, members common to two sets make up a special third set, called the intersection. For intersection we use the \( U \) symbol upside down, \( \cap \), and call it a "cap."

These three operations can be combined into interesting formulae which can be used to explain semantics.

In Figure 12 we have the phrase, "not sick boys, others." Others here means other boys, but not sick ones. The word others is in apposition to the phrase "not sick boys."

If on the other hand, boys is emphasized, we then take that as an indication that the not goes just with boys and (Figure 13) in the set theory we place the not bar over set B for boys, just as we place it over the S in the phrase before. Thus the bar placement in the set notation corresponds to the not; when clarification is needed to explain
exactly what we mean by not, that is, which part is actually negated, then the emphasis is helpful. If, on the other hand, as in the next phrase, (Figure 14) sick boys is emphasized as a whole, then the bar goes over the entire set theory phrase also. Note that sick boys is one emphatic phrase, not two, as I wrote in Figure 20 of Some Proposals for Junction Grammar. The emphasis is helpful, but not necessary if no one part of the noun phrase goes with the not bar. When the whole phrase is to be negated, no emphasis has the same effect as emphasis over the whole, as shown in Figure 15. Emphasis has other uses, and this illustrates just one.

Another typical set-theory notation for the bar is the prime mark. These are compared in Figure 16.

Note that the semantic result of the phrase sick boys is the same as the phrase boys who are sick, except for the reference to tense. Thus the phrase "who are sick" designates a set of all those "who are sick." In the phrase, the apple that the boy ate, the phrase "that the boy ate" likewise designates the set of all that the boy ate. We can intersect that set with the set of apples (we use only three, like we did for the set of boys). The boy ate cereal(1) toast(3) and apple(2). If apple(2) did not exist, then the intersection would be empty, and the sentence would be false. In this way, the set-theoretics give us true/false denotations for our sentences (refer to the excellent material in Packard's book on logic, in the bibliography in Proposals.)

These modifiers can restrict the scope of the noun they modify. That is, the resultant intersection is sometimes smaller than the original noun was (Figure 18). This is then called a restrictive modifier. If, on the other hand, the result is not smaller, it is a non-restrictive modifier. All adjectives fall into this dichotomy. Some prepositional phrases and appositives do as well. There is no way to increase the scope however. Union operation correspond to the operation and. An and phrase is not a modifier, but a conjoined element. Junction Grammar agrees with this. In modifiers, however JG claims that there is a third type. JG bases all of its three types on a criterion of the relative scope of the left and right operands. For example, JG says that for non-restrictive, the scope of the modifier is the same as that of the noun. An example sentence they use is "John Wayne, who is a famous movie star,..." (Non-restrictive Modifiers I by Eldon G. Lytle, page 1, no date).

Another example from the same page, is:

The governor, in China at the present time, left this note for you.
The scope of the governor is one, but if the scope of in China at the present time is also one, then the governor must be the only one in China at all. It is true that this is a non-restrictive modifier, but JG gives the wrong reason. The right operand does not enter into the criterion at all. It is non-restrictive, because the intersection (dominant node) is the same size as the left operand, regardless of how many millions make up the scope of the right operand. That is, the scope of the governor is just one, and the scope of the governor, in China at the present time, is also just one. The additional phrase does not change the scope.

In the sentence Boys who are poor need money, the scope of boys who are poor is smaller than boys. Otherwise, the sentence claims that boys are poor.

In Proposals we mentioned in a footnote (29) that the JG discussion on intersection included some additional contradictions which I removed for the sake of clarity in emphasizing another issue. We now present that contradiction and the resulting consequence.

Figure 20 shows us the JG restrictive modifier example, with emphasis on who are poor. If who is really a subset, that is, completely contained in set B, then all who are poor (W) are boys—clearly false. On the other hand, other JG literature (see reference B 22 in Proposals) indicates that the who node means the already intersected "boys who are poor." This tells us then that the right operand is equal to the dominant node. Since we said that the dominant node, not the right operand is important, and JG says the two are equal here anyway, the confusion begins.

Figure 21 shows the other sentence of this minimally contrasting pair. Here the emphasis is on boys, and JG gives the diagram shown. However, redrawing the diagram with our labels, shows that all boys are poor boys, since B is contained in W, and W has to mean "boys who are poor" in order for the last sentence (Figure 20) to make sense. In one sentence, W has larger scope than B, and in the other one, it has smaller scope. No single interpretation of W works for both sentences, and the two cannot be compared.

To isolate the effect of the emphasis on the meaning of others, the two sentences must be the same in all other respects (the Latin term ceteris paribus, a favorite of Halle and Jakobsen, fits here). That is, as far as the scope diagrams to, one diagram is needed to work for both sentences.

In Figure 23 we present such a diagram, repeat from Proposals. W must be different from the resultant intersection. Note carefully that any emphasis, or presence of the pronoun others in the sentence does not alter the fact that
the intersection (dominant node only) has a smaller scope than does the original noun at the left operand. Such an example with $B \cap W$ is just as much a restrictive clause example as are the other examples. Emphasis and calculation of others is a separate matter from restriction. Also, emphasizing $B$ is no more distinctive than emphasizing $W$, and so the extra label of Frame II is unwarranted— we would have as many "frames" as combinations of clauses and others. As it stands, the JG formulae are unworkable. (Figure 24.) The first two, $B-W$ and $W-B$ contradict each other, and imply that all boys are poor. JG literature is silent on the third type, which is no less common than the other two.

Restriction versus non-restriction is an exclusive binary category. All modifiers are one or the other, and the criterion is the relative scope of the resultant intersection and the original noun. There is no third choice. Frame II is not a third type as JG claims.
1. 

- Boys
- Girls
- Men
- Women

2. 

- $B = \{1, 2, 3\}$
- $G = \{4, 5, 6\}$
- $M = \{7, 8\}$
- $W = \{9\}$

Scope:
- $B = \{1, 2, 3\}$
- $G = \{4, 5, 6\}$
- $M = \{7, 8\}$
- $W = \{9\}$

3. $S = \{2, 3, 6, 8\}$

4. $\overline{S} = \{1, 4, 5, 7, 9\}$

5. $\overline{B} = \{4, 5, 6, 7, 8, 9\}$ (not boys)

6. $\overline{G} = \{1, 2, 3, 7, 8, 9\}$ (not girls)
7.  \[ C = \{1, 2, 3, 4, 5, 6\} \]

8.  \[ C = B \cup G \]

9.  \[ A = \{7, 8, 9\} \]
    \[ A = M \cup W \]

10. \[ B \text{ Street} \]

11. 2 and 3 are in the intersection of S Street and B Street.

\[ S \text{ intersect } B = 2, 3 \]
\[ S \cap B = \{2, 3\} \]
APPPOSITIONS

12. \[
\text{Not sick boys, others!}
\]
\[
S \cap B = \text{others}
\]

13. \[
\text{Not sick boys, others!}
\]
\[
S \cap \overline{B} = \text{others}
\]

14. \[
\text{Not sick boys, others!}
\]
\[
S \cap B = \text{others}
\]

15. \[
\text{Not sick boys, others!}
\]
\[
\text{Not } (\overline{B}) = \text{others}
\]
\[
S \cap B \quad \text{same as } \#4
\]
16. **EQUVALENT NOTATION**

\[
\begin{align*}
S \cap B & \quad S' \cap B \\
S \cap B & \quad S \cap B'
\end{align*}
\]

17. The apple that the boy ate

The apple \( \{ \text{apple}_2 \} \) that the boy ate \( \{ \text{cereal}_2, \text{toast}_3, \text{apple}_2 \} \)
18. **RESTRICTIVE**

Result is smaller than original noun

\[ \text{boys} \cap \text{sick} \]

\[ 1 \quad 2 \quad 3 \quad 6 \quad 8 \]

\[ \text{sick boys} \]

**NON-RESTRICTIVE**

Result is NOT smaller than original noun

\[ \text{boys who are children} \]

\[ \text{(all boys)} \]

\[ B \cap C \]

\[ \text{boys} \]

\[ \text{who are children} \]
John Wayne, who is a famous movie star,...

Example from

Non-restrictive Modifiers I, by E.G. Lytle

JG claims, however, that the left and right operands (John and who) are equal—then he is the only "famous movie star" or the operation has already taken place.
20. boys who are poor

This implies that all who are poor are boys. To correct this, W must mean "boys who are poor"

which is also the result of the conjunctions!
21. boys who are poor

If $W = \text{boys who are poor}$ as required in #20, then all boys are poor boys!
This is a contradiction

22. #20

\[ W \text{ has smaller scope than } B \]

\[ W \text{ has greater scope than } B \]

No single interpretation of $W$ works for both sentences.

Languages and Linguistics Symposium 1978
ONE DIAGRAM
FOR BOTH SENTENCES

\[ \begin{align*}
B & = \{1, 2, 3\} \quad \text{all those who are boys} \\
W & = \{1, 2, 8, 9\} \quad \text{all those who are poor} \\
\overline{W} & = \{4, 5, 6, 7\} \quad \text{all who are NOT poor} \\
\overline{B} & = \{4, 5, 6, 7, 8, 9\} \quad \text{all who are NOT boys} \\
B \cap W & = \{8, 9\} \quad \text{all poor who are not boys (\#21)} \\
B \cap \overline{W} & = \{3\} \quad \text{all boys who are not poor (\#20)}
\end{align*} \]

\[ \overline{B} \cap W \] is supposed to be "Frame II" but it is restrictive. "Others" is not a modifier, but a pronoun, and has no special rule from \#31 or \#20.
24. "OTHERS"

Intersection Formulae

1. $B \cap \overline{W}$
2. $\overline{B} \cap W$
3. $B \cap W$

JG Formulae

$B - W$
$W - B$

$\{\text{Contradictory}\}$

all boys must be poor

25.

RESTRICTIVE

NON-RESTRICTIVE

"Frame II" is not a third type of modifier
SOME COMMENTS ON INTERSECTION
AND INTERJUNCTION IN JUNCTION GRAMMAR

Alan K. Melby

At the fall 1977 session of the BYU Linguistics Symposium, Michael McOmber read a paper entitled "Some Proposals for Junction Grammar." Although the proceedings of the symposium have not yet been published, Mike has made available the text of his paper and has invited responses to it. The present paper is one man's response.

THREE PROPOSALS

Mr. McOmber's major proposals are summarized at the end of his paper:

(1) "Axiomatic contradictions <transformationality>, circular reasoning, and redundancy need to be checked for throughout all of Junction Grammar.

(2) The formalism needs to be completed, definitions made, and most of all,

(3) interjunction should be eliminated in favor of intersection."

With point (1), everyone should agree. Every linguistic theory should be checked for internal contradictions, circular reasoning, and unneeded redundancy. As Junction Grammar (JG) evolves, these obvious checks are constantly applied to it. Of course, redundancy is not always bad. Available exposition on JG is certainly not flawless, but I do not believe Mr. McOmber has pointed out any inconsistencies among well-established JG axioms. In a constantly evolving theory like Junction Grammar one does not even find all the "well-established" axioms written down in one place. I will not comment on Mr. McOmber's apparent claim that axiomatic contradictions are equivalent to transformationality because he doesn't give any arguments for it or even explain it.

Point (2), I believe, refers to the formalism of JG presented at the Spring 1974 session of this symposium in a paper by Lytle and Packard. That formalism was largely the result of an interdepartmental seminar in which I participated. I have also worked on other formalisms of Junction Grammar (e.g. Melby, 1972). Junction Grammar is a model of language that was developed intuitively, not by starting with an existing mathematical model and gradually adjusting.
it in a formal way. I consider this approach to be one of the strengths of Junction Grammar, but it does raise the problem of how best to formalize it. I am not completely satisfied with any past attempt, but I do believe it is worthwhile at various points during the evolution of JG to attempt a new formalism. To date, none has pretended to be a complete and accurate description of JG. Indeed, I feel it is a serious error to assume that a linguistic theory should fit into available mathematical formalisms. In fact, JG was developed because of the inadequacy of existing linguistic and mathematical models. Therefore, for example, I would not accept as valid any argumentation which assumes that Junction Grammar should be formalized strictly within the bounds of standard set theory.

This concludes the discussion of the first two proposals and brings us to the third proposal, with which I cannot agree at all.

INTERJUNCTION vs. INTERSECTION

Mr. McOmber's major proposal for JG is that "interjunc­tion should be eliminated in favor of intersection." In other words, he proposes that "sick boy" be represented as:

```
A
|   |
B  C
```

Figure 1 INTERSECTION

instead of using the JG representation:

```
N
|   |
N SA
|   |
PA
```

Figure 2 INTERJUNCTION

He objects to Figure 2 on two grounds: (1) Interjunc­tion requires trees which do not fit the mold of standard n-ary trees. (2) The interjunction version of "sick boy" uses two more nodes than the intersection version, and he suggests that these additional nodes are redundant and unne­cessary.

Mr. McOmber's diagram is certainly simpler and we have considered using a diagram of the same form. As a matter of fact, a similar proposal appears in one of Lytle's Linguistics 501 materials, "The Evolution of Junction Grammar." Here is a figure from that paper (which is listed as reference "M" in Mr. McOmber's paper):
Melby: Some Comments on Intersection

Figure 3. Simplified diagram for an adjective modifier of a noun.

On the same page as that figure, Lytle candidly states: "I admittedly had some qualms about using so much structure to represent a phrase with only a few words, but attempts to simplify repeatedly led to the loss of descriptive and explanatory power." Lytle then discusses some of the problems associated with the simplified diagram and ultimately rejects it. I suspect that the main problem with JG diagrams is not that they are too complex but that they are too simple to describe the incredibly complex phenomenon of natural language.

It should also be pointed out that the idea that interjunction involves intersection is not new. In fact, it can be traced back in JG all the way to 1970, as reflected in the title of Daryl Gibb's master's thesis: "An Application to Mechanical Translation of a Recursive Algorithm Based on the Operations of Union and Intersection." (Italics added.)

A NEW PRESENTATION OF AN OLD PROPOSAL

Let us summarize what we have discussed so far. McOmber proposes that the Junction Grammar diagram for relative modifiers be simplified to show only an intersection. We have seen that interjunction has long been recognized to involve intersection and that even the form of Mr. McOmber's diagram has previously been proposed and rejected within JG. So we are dealing with a new attempt to justify an old proposal. Perhaps Mr. McOmber should have made it more clear that his proposal is not new. Nevertheless, he deserves a fair hearing in order to determine whether his paper sheds additional light on the issue of modification or points out flaws in the reasoning used when the proposal was previously considered. Unfortunately, his proposal is lacking in detail, and, in my opinion, sheds no significant new light on the issue.

SOME IMPLICATIONS OF THE PROPOSAL

Before considering Mr. McOmber's arguments, let us consider a few of the implications of his proposal. In the proposed diagram:

Figure 4.
the intersection is between the set of boys (B) and the set of sick people (C). Unfortunately, the diagram does not provide a node for the attribute sick. Thus, if one considers the phrase "The very sick boys," there is a problem in finding a place for the quantifier "very." It clearly quantifies the sickness and not the number of persons who are sick. This indicates the flavor of the problems often encountered when one tries to simplify a diagram. The simpler diagram may appear to work in some cases but when it doesn't the simplicity may add complexity in another part of the system or destroy desired distinctions.

Another effect of the intersection diagram is to lose the SX and PX nodes that allow JG to distinguish among various levels of adverbial modification. Consider the sentence:

"Happily, the boy took his medicine." Figure 5.

In one reading, the boy was happy about taking his medicine; in another, the boy was perhaps very unhappy but the speaker was happy because the medicine helped the boy recover. In the interjunction diagram, this and many other semantic distinctions are based on whether the modifier is on the predicate level (PX) or predication level (SX). If one considers the following phrase: "The happily sick boy," he will detect the same two readings for "happily" that were discussed above. This means that the JG interjunction diagram for all modifiers provides one mechanism for certain semantic distinctions which apply across categories. (This works for prepositions too. Consider the various readings of "He flipped the coin on the table." This approach is a result of one of the basic assumptions of Junction Grammar: syntax is one component of semantics and thus there can be no syntax/semantics dichotomy. Of course, the distinction between the two readings of "happily" can be treated as a word sense distinction and thus be made to fit into the intersection diagram, but that would be against the basic JG principle that point of modification does affect meaning. In other words, my criticism of the intersection diagram is not that it may not be useful in some model of language yet undefined; my criticism is that the intersection diagram cannot work within the basic framework of JG. I will try to clarify this point with another example. Consider the phrase "the fact that John learned." This phrase is a common example of the relative/complement ambiguity. In the relative reading, John learned a fact. In the complement reading, it is claimed to be a fact that John learned <something>. Let us examine the JG method of making this distinction.
Mr. McOmber's proposal (from traditional grammar) is as follows:

![Diagram of relative/complement distinction in JG]

Junction Grammar relative diagram shows that the relative pronoun "that" is a fact, and it shows that the relative pronoun is also the direct object of "learned." The JG complement diagram shows that the "that" is then a complementizer of the whole embedded sentence, and it shows that the referential overlap between "fact" and the embedded sentence is total whereas in the relative reading, the overlap is only with the relative pronoun. In other words, in the phrase "the fact that he came," "that he came" is a fact; but in the phrase "the apple that he ate," "that he ate" is definitely not an apple.

The above implications (loss of the PX and SX nodes, and loss of the JG relative/complement distinction) are among the reasons that led to the rejection of this proposal long ago.

In JG, the first crucial break with TG came when it was set down as a JG axiom that ++ the diagrams for the relative and complement constructions must show explicitly what elements overlap referentially. In the intersection approach, it is unclear how these semantic distinctions are made explicit. This is a major gap in Mr. McOmber's presentation. I am not saying they cannot be made; I am simply saying that Mr. McOmber's proposal might be part of another model of language but no part of Junction Grammar.
PROCESSING SPEED

Mr. McOmber makes a brief comment at the end of his paper to the effect that reducing the number of nodes in J-trees would speed up processing of J-trees and therefore reduce computer bills. This claim is rash at best. It has often been my experience that reducing the number of nodes in a tree increases the complexity of the processing and more is lost than gained. In noun phrases, for example, the article node can be hidden in features but overall, the processing of the feature is more expensive than the processing of the extra node. In computational applications the advantage of similar processing among all types of relatives has been found to more than make up for the extra processing on the little used PA and SA nodes of an adjective modifier. In other words, overall, the extra nodes speed up and simplify processing rather than slow it down. Another assumption that Mr. McOmber seems to be making is that speed of processing is more important than ease of processing. If speed of processing were all important, computational linguists would do all their programming in machine language. This would be ridiculous because the difficulty of coding a large system would probably be insurmountable. Most computational linguists would say it is most important to get the job done first and then look for ways of doing it more efficiently, if possible. One quickly verified evidence of this is the fact that much work in computational linguistics is done in the horribly slow language called LISP.

SUMMARY OF THE PAPER UP TO THIS POINT

To this point, the present paper has dealt mainly with the implications of Mr. McOmber's proposal that interjunction be reduced to intersection. I have reviewed several assumptions of Junction Grammar and have shown that Mr. McOmber's proposal is inconsistent with them.

I will conclude this paper with a consideration of a few of Mr. McOmber's specific arguments.

J-TREES AS FORMAL OBJECTS

Before Mr. McOmber begins arguing for a simple intersection approach, he argues against interjunction on formal, not linguistic grounds. I will respond likewise.

He notes that the following binary tree works out:
Then he suggests that the interjunction version would be:

\[\begin{align*}
4 & \quad 8 \quad - \quad 2 \\
5 & \quad + \quad 3
\end{align*}\]

First, I don't see why J-trees should be expected to work for arithmetic, and second, there are interjunction versions that will work:

\[\begin{align*}
17 & \quad 15 \quad + \quad 2 \\
5 & \quad * \quad 3 \quad + \quad 5
\end{align*}\] or

\[\begin{align*}
4 & \quad 8 \quad - \quad 2 \\
5 & \quad + \quad 3 \quad + \quad 3
\end{align*}\]

But so what?

Mr. McOmber says there is a difficulty in determining the meaning of the slash symbol in an interjunction rule (e.g. \(N*N/ SV=N\)). He says there are two alternatives (syntacto-semantic operator and non-syntacto-semantic operator), but he ignores two other interpretations in which the slash is not an operator at all but a context delimiter:

(1) In a constructive approach to J-tree definition, the rule \(N*N/SV=N\) indicated that the following junctions occur all at once:

\[\begin{align*}
N & \quad N \quad SV \\
N & \quad * \quad N \quad + \quad PV
\end{align*}\]

There is no problem of missing nodes or double based transformations unless one attempts to artificially force J-rules into the mold of standard phrase structure rules.

(2) In a node admissibility approach, the tree is already built and the rule simply accepts or rejects it depending on whether the \(N*N\) is in the context of an SV adjunction. By the way, the function "f" Mr. McOmber complains is undefined is a
general labelling function which is defined in
detail by the particular set of J-rules one uses in
a particular junction grammar. This is further
explained on the page after the one in Mr. McOmber's Figure 10. For example, the N*SV=N in Den-
nis Packard's formalism would be (N*,(N1,N2)),
(SV+, (N2,PV3)), and ((N*,SV+),N2). That is, there
are two dominant nodes (N* and SV+) and a shared
topic or intersect node (N2).

This gives the structure:

```
N*       SV+
\-----\-----
N1       N2   PV3
```

I think that part of the confusion concerns the distinction
between constructing a J-tree (which is the concern of the
Packard paper) and compiling a J-tree once built. This com-
piilation process has only been briefly touched upon in the
JG literature and is still in early development.

Mr. McOmber argues against some of the objections to
simplified interjunction.

DERIVATION

Mr. McOmber argues that if N* sick is a derivation
("sickness") then boy * who would be a derivation also.
This supposed inconsistency is not one all all. All deriv-
ations are full subjunctions but not all subjunctions (espe-
cially interjunctions) are derivations. Another common
example of subjunction which is not derivation is quantifi-
cation (e.g. "two boys").

INDIVIDUAL vs. CLASS REFERENCE

Mr. McOmber suggests that there is a confusion over
dominant versus terminal assignment. There is a confusion
but it is Mr. McOmber's. J-tree construction involves only
assignment of category to dominant nodes. ++ It is J-tree
compilation, an entirely separate process, which involves
assignment of referential value to various nodes, terminal
and dominant.

The objection he discusses is not motivated by confu-
sion but by the desire to maintain a parallelism between
relative clause and adjective modifiers. The "who" of "The
boy who had braces" receives a referential value during com-
pilation and so the topic of an adjective modifier is
assumed to also.
THE "PROXIMITY" PRINCIPLE

Mr. McOmber does not explain what he means by the "proximity" principle. Apparently, Mr. McOmber assumes that JG claims all referential overlap to involve a subjunction. JG does not claim this but rather the converse: ++ all subjunction involves some referential overlap. So, his "counter examples" are not counter examples at all. They merely point out other varieties of referential overlap than subjunction.

ORDER OF PROCESSING

Concerning the order of processing objection, Mr. McOmber suggests that Lytle states that intersection doesn't work. He quotes Lytle as follows:

"<intersection> actually won't do".

This is a misquote. Lytle is saying that independent evaluation of the operands of a *- or -* subjunction won't do. On the very next page, Lytle clearly states that in both cases "node 1 is assigned the intersection." What Lytle is saying is that if one can break out of the mold of standard set theoretics and consider the process of evaluating a linguistic intersection, the meaning of "others" in the cases of *- and -* can be explained in terms of order of processing. In other words, "boys who are poor" involves determining which boys are poor. Those boys which are not poor become the remainder. On the other hand, "boys who are poor" involves determining which poor people are boys. Those poor people who are not boys become the remainder. In both cases, we calculate the intersection of "boys" and "who are poor" as the value of the noun phrase but a different value for "others" depending on the order of processing. If the operands are evaluated independently and intersected by standard set theory, "others" must be calculated by some other process.

Mr. McOmber suggests that the value of "others" is calculated "with not operators taking the complement of any emphasized node/set." For the two cases discussed above, Mr. McOmber's method works as well as Lytle's (although differently). Then Mr. McOmber considers two other cases: (1) "the boys who are poor..." (both stressed) and (2) "the boys need money but the others don't" (no relative clause). I am not at all sure that in (1) the meaning of "others" is well-defined. At any rate, it probably does not mean B' W' as Mr. McOmber suggests. His interpretation would exclude rich boys from "others". That is, "rich boys" are not among the "others" who don't need money. Does this mean rich boys do need money (a contradiction)? As for (2), in which there is no relative clause, the value of "others" is calculated
Some Comments on Intersection by default as the universe of discourse minus the computed value of the noun referment (U-B), i.e. everyone except the boys. (See the r+r' = U section in A Grammar of Subordinate Structures in English, Lytle, 1974.)

Mr. McOmber's system also works for (2). However, Mr. McOmber does not consider the case where neither operand is stressed ("the boys who are poor need money but the others don't.") In JG, the relative clause uses =*, which generates no remainder. Then the same default calculation applies as for "boys need money...". This "others" is everyone except poor boys (U - (B W)). However, Mr. McOmber's method would seem to set "others" to B W ("poor boys") since there are no stressed words and thus no not operators. This is clearly false but Mr. McOmber neglects to explain how "others" should be evaluated in this case.

SUMMARY

In summary I must reject Mr. McOmber's proposal to eliminate interjunction because it is inconsistent with basic assumptions of Junction Grammar. Furthermore, I must conclude that his claims of inconsistency among the axioms of JG are unfounded because his arguments either (1) are based on misunderstandings of the axioms of JG, or (2) fail to consider all alternatives or (3) attempt to force JG into some inappropriate mathematical mold.
REFERENCES


MARTIN LUTHER'S LANGUAGE IS DEAD

Marvin Folsom

This pronouncement of the death of Luther's language is in the first sentence of an article by Hans Eggers (Der Spiegel, 11 March 1968) entitled "Neudeutsch." Eggers refers to such features as:

1. The portion of sentences that have a subordinate clause or a dependent infinitive has decreased from 80% to 40%.

2. Nowadays, 60% to 70% of all relative clauses are trivial.

3. Sentence fragments of the type Das ganz gewiß nicht, Nicht im Traum constitute 2.5% of all sentences, whereas they were virtually unknown 150 years ago.

4. The subjunctive is disappearing (hülfe = würde helfen).

5. Sentences are becoming shorter.

6. Der Nachtragsstil (Was hatte er nun erreicht, durch diese Anstrengungen?) is becoming popular.

7. Pseudo-compounds (Künnendeattierer Nixon) and parenthetic constructions (Das ist, das wissen wir ja alle, eine Selbstverständlichkeit) are increasing.

Eggers maintains that in the last century the literary (written) language (Schriftdeutsch) was distinct from the spoken language (Sprechdeutsch), but that this difference is now becoming less and less. Eggers attributes this development to the urbanisation which began about 1871 and has been continuing up to the present time. He also believes that both processes (urbanisation and continued movement of the standard written language in the direction of the style of the spoken language (Umgangsdeutsch)) will continue. In this paper, I would like to present data from 55 Bible translations from 1545 to the present to show not only that Luther's language as the standard written language is dead, but that the language of Luther's Bible is also dead.

Most of the data presented here concern grammatical and syntactic features. Vocabulary items still remain to be investigated, though an occasional example is included here. I have selected Menge as a point from which to measure for two reasons: (1) Most of the changes cluster around the time of Menge's first edition (1907), (2) Menge's later edi-
tion (1926) incorporates fairly systematically many of the developments that were only used haphazardly in his first edition. Unless otherwise noted, the verses are cited according to the revised Luther edition of 1956/64.

1. Verb morphology and Syntax

   a. Perfect Auxiliary of *sitzen*, *stehen*

The Luther edition of 1545 has *ist gesessen* in Luke 19:30 which has been revised in the 1956/64 edition to *hat gesessen* to agree with standard German. (Acts 27:23 of the revision still has *ist gestanden.*) Twelve of the translations before Menge have *ist gesessen* and 8 have *hat gesessen*. After Menge, 3 have *ist* and 13 have *hat*.

   b. Replacement of the Perfect by the Simple Past

The tense forms in Matthew 25:35 (*ich bin hungriug gewesen* 'I was an hungered') had the simple past in 57% (12 of 21) of the translations before Menge. After Menge, 88% (23 of 26) used the simple past. The following forms of the simple past were used as indicated: *wurde* (1), *litt* (1), *hungerte* (4), *hatte* (4), and *war* (24). There were 12 examples of *bin gewesen*.

   c. Replacement of the subjunctive by *wurde* + infinitive or indicative -- The following verse from Matthew 16:26 contains four subjunctive forms.

   Was *hülfe* es dem Menschen, wenn er die ganze Welt *gewönne* und *nehme* doch Schaden an seiner Seele? Oder was kann der Mensch geben, damit er seine Seele wieder *löse*?

   'For what is a man profited, if he shall gain the whole world, and lose his own soul? or what shall a man give in exchange for his soul?'

Before Menge, 57% (48 of 84) of the forms were in the subjunctive. After Menge, only 22% (23 of 104) used the subjunctive, a drop of 35%.

   d. Replacement of *ward* by *wurde*

   ...zu deren keiner *ward* Elia gesandt ...(Luke 4:26) 'for unto none was Elias sent'

Before Menge, 36% had *ward* in this verse (8 of 22). After Menge, only 11% (3 of 27) used
ward. Wurde is replacing ward more in its uses in the passive than as a lexical verb meaning 'to become, get'. Ward is very persistent in the phrase in Genesis 1:3: und es ward Licht. 77% (7 of 9) of the translations of the Old Testament after Menge still have ward in this verse.

e. Replacement of offenbart by geoffenbart

In Romans 3:21 ('But now the righteousness of God without the law is manifest'), four translations before Luther have eröffent, two have offenbar and six have geoffenbart. Luther and six others after Luther have offenbart, 13 have geoffenbart, 15 have offenbar and 11 have other verbs or adjectives such as enthüllen, zeigen, deutlich, klar, etc. Not only is the word offenbaren itself becoming obsolete, but the form of the past participle used by Luther is also disappearing.

f. Changes among the modal auxiliaries

Können is replacing vermögen: Gott vermag dem Abraham aus diesen Steinen Kinder zu erwecken (Matthew 3:9). The Einheitsübersetzung has:

Aus diesen Steinen kann Gott Kinder Abrahams machen. Brauchen is being used more and more as a modal auxiliary (Der braucht seinen Vater oder seine Mutter nicht zu ehren, Matthew 15:6; Gute Nachricht für Sie, 1967). No examples of brauchen used as a modal were found in Luther 1545 but over 40 were found in Gute Nachricht für Sie.

2. Clause and Sentence Syntax

a. Word Order

The rather free word order of Luther's Bible (all editions except the most recent published in 1975) is becoming more and more rigid. There are fewer Ausklammerungen in the modern translations. In Matthew 16:18, Luther has:

Du bist Petrus, und auf diesen Felsen will ich bauen meine Gemeinde, whereas more modern translations are more likely to have something similar to the Einheitsübersetzung of 1972: Du bist Petrus, und auf diesen Felsen werde ich meine Kirche bauen 'Thou art Peter and upon this rock I will build my church'.
b. Incapsulation vs. Linear Order of Clauses

damit, wenn ihr den Vater bittet in meinem Namen, er's euch gebe (John 15:16)
'That whatsoever ye shall ask of the Father in my name, he may give it you'

Luther has the clause beginning with wenn inside the clause beginning with damit in the same way English has juxtaposed the two clause introducers that whatsoever. This incapsulated order has yielded to a linear order of clauses, as for example in Rosalino (1781): dass der Vater euch alles gebe, was ihr in meinem Namen bitten werdet. The average number of incapsulations in the ten verses examined in bibles before Menge is 6.86. Three of these bibles showed incapsulation in all ten verses. The average number in bibles after Menge is 2.6, a decrease if 4.7 out of ten. Five of the 25 did not have a single example of incapsulation.

3. Prepositions

a. Replacement of gen by in, or nach

Da kamen Weise vom Morgenland gen Jerusalem (Matthew 2:1) 'there came wise men from the east to Jerusalem' In this meaning, no Bible after Grundl (1904) uses gen. There are only 18 examples of gen out of a possible 255, or only 7%.

b. Replacement of gen by auf zum

was steht ihr und sehet gen Himmel? (Acts 1:11) 'Why stand ye gazing up into heaven?' In the verses examined in the bibles before Menge, 42% used gen (70 of 168), but in thosed after Menge, only 12% used gen (22 of 182), a 30% reduction.

c. Replacement of darin, etc. by in ihnen, in ihr, etc.

denn ihr meinet, ihr habt das ewige Leben darin (Luther 1545 drinnen) (John 5:39) for in them ye think ye have eternal life'

20% of the verses in bibles before Menge (66 of 325) had a preposition plus a personal pronoun. After Menge, 37% (131 of 352) had a personal pronoun. The earlier edition of Menge has two
more da-compounds than the later edition. Seven translations (including Luther) have da-compounds in all the verses examined. Interestingly enough, Mentel (1466) has no da-compounds in any of these verses. In this respect, Mentel anticipated the development of modern German. It remains to be seen in what other areas this may also be true. Specifically in John 5:39, 42% (11 of 26) before Menge had in ihnen, after Menge 69% (18 of 26) had in ihnen, an increase of 27%.

4. Pronouns

a. Replacement of welcher by der

In 13 verses in 21 bibles before Menge, 40% have a form of the relative pronoun welcher (109 of 273). In the same verses in bibles after Menge, only 1% used a form of welcher (4 of 338), a decrease of 39%.

b. Replacement of darin/worin by in der, etc.

zu der Gnade, darin wir stehen (Romans 5:2) before Menge, 4 used darin, 2 used worin, 4 used in welcher and 6 used in der. After Menge, no one used darin, one used worin, 18 used in der and two used in dem.

c. derjenige is dropping out in favor of jener or der.

d. niemand (acc.) is being replaced in many instances by keinen and in some recent translations the ending is being re-introduced (niemanden in Wilckens 1972).

5. Other

a. Replacement of wo ... hin by wohin

wir wissen nicht, wo du hingenst (John 14:5) ‘we know nor wither thou goest’ In the verses examined (15) in the bibles before Menge, 66% showed separation (249 of 375). In those after Menge, 23% showed separation (95 of 405). Seven translations showed no separation in any of these verses. Menge’s earlier edition has separation in 4 instances but the newer edition has none. Mentel has only wo or da but no compound forms.
b. Replacement of the Saxon genitive (der Witwen Häuser = die Häuser der Witwen)

sie fressen der Witwen Häuser (Mark 12:40) 'they devour widows' houses'. In a seminar paper, Charles Green examined 54 examples in 53 translations, only two have retained 30% of the Saxon genitives found in Luther. Mentel (1466) and Jedermanns-Bibel (Leipzig 1930) have only one each. In the verse cited above in the example, 52% of those before Menge (13 of 25) have a Saxon genitive, whereas only 10% (3 of 28) after Menge have a Saxon genitive, a decline of 42%.

c. Replacement of ein Stück gebratenem Fisch/ein Stück gebratenen Fisches by ein Stück gebratenen Fisch

Und sie legten ihm vor ein Stück gebratenem Fisch (Luke 24:42) 'a piece of broiled fish'

Before Menge, 57% have von, 19% have a genitive and 24% have an accusative. After Menge, 22% have von, 26% have a genitive and 52% have an accusative. The genitive actually increased slightly (from 19% to 26%), the use of von dropped drastically (from 57% to 22%), but the accusative registered an increase of 28%.

d. Use of zwei for zween, zwo, zwei

Luther has zwo hende, zween Füsse, zwey Augen (Matthew 18:8-9) but Kistemaker (1825) is the last translation to make a distinction in the gender of the numeral 'two'.

e. The loss of the dative and accusative forms of Jesus (Jesu, Jesum)

After Kistemaker (1825), only the Mülheimer Ausgabe of 1924 (with Jesu Christo, Jesum) and Bruns 1959 (with Jesum) have inflectional endings for the accusative or dative. After 1825, inflectional endings are virtually non-existent, except for the genitive endings which are retained by most of the translations. Gute Nachricht für Sie (1967) has no genitives on the four verses examined, usually replacing it with von. The revision (Die Gute Nachricht 1971) re-introduced the genitive in two of the four verses. In the 1971 revision, 38 examples of the phrase von Jesus Christus were replaced by Jesu Christi.
f. Replacement of auf Erden by auf der Erde

Dein Wille geschehe auf Erden wie im Himmel (Matthew 6:10) 'Thy will be done in earth as it is in heaven.' 20% of those before Menge (36 of 184 in 8 verses) have auf der Erde, after Menge 30% have auf der Erde, a 10% increase. Luther has auf Erden throughout. Menge's earlier edition has 4 examples of auf Erden and 4 examples of auf der Erde, but the later edition has auf der Erde in all eight verses. Strangely enough, Wilckens (1972) has auf Erden in all eight verses.

6. Vocabulary

One looks in vain for such words as mitnichten, sintemal, afterreden, Schnur 'daughter-in-law' in modern translations. So far one example has been checked in the 55 translations. denn ein Geist hat nicht Fleisch und Bein (Luke 24:39) 'for a spirit hath not flesh and bones.' Some have Gebein in place of Bein. Menge (1907), Jedermanns-Bibel (1930), Tillmann (1961), Fotobibel (1965), Die Gute Nachricht (1971), Die Einheitsübersetzung (1972) and Wilckens (1972) all have Fleisch und Knochen. All others have Fleisch und Bein in agreement with Luther.

Additional work is being done on the optional dative -e, the use of diminutives, the double negative, the use of the subjunctive in als ob-clauses and in indirect discourse, and other aspects of the decline of the genitive.

The work already done and now in progress allow us to draw the following conclusions:

1) Around 1900, numerous changes in various aspects of biblical German manifest themselves in the translations.

2) At least three such changes (the use of der instead of welcher, the use of preposition + personal pronoun instead of a da-compound, and the absence of the Saxon genitive) were well developed in Mentel (1466) and have re-emerged after having been overshadowed by Luther's language for over 300 years.

3) The style of Luther's translation of the Bible has gradually but inevitably deteriorated to the point where we can now say that it has been dying slowly over the centuries and we can now, without any legal delays, remove the artificial life support
systems, fill out the death certificate and declare Luther’s biblical language officially dead.

Summary

1. Verbs
   a. ist gesessen = hat gesessen
   b. ich bin hungrig gewesen = ich war hungrig
   c. hülfe = würde helfen, hilft
   d. ward = wurde
   e. offenbart = geoffenbart
   f. vermögen = können

2. Clause and Sentence Syntax
   a. werde ich bauen meine Gemeinde = werde ich meine Kirche bauen
   b. damit, wenn = damit ..., wenn ...

3. Prepositions
   a. gen = in, nach
   b. gen = auf zum
   c. darin = in ihnen, etc.

4. Pronouns
   a. welcher = der
   b. derjenige = wer, der
   c. niemand = keinen, niemanden

5. Other
   a. wo ... hin = wohin
   b. der Witwen Häuser = die Häuser der Witwen
   c. ein Stück gebratenem Fisch/gebratenen Fisches = e. St. gebratenen Fisch
   d. zween, zwo, zwei = zwei
   e. Jesus, Jesum, Jesu = Jesus, Jesu
   f. auf Erden = auf der Erde

6. Vocabulary
   a. Bein = Knochen
The translation challenge the Church faces is tremendous. There are roughly 3,500 world languages. If we were to provide basic Gospel materials in all of the languages, and produce them at the present rate it would take 875 years to do so. The Church has created a list of approximately 250 priority languages which account for about 80% of the world's speakers. Producing translated materials for these languages, at the present rate, would still take over 60 years. We simply have to produce translations more rapidly and more efficiently.

Men of great vision have foreseen the role that modern technology would have in meeting that challenge. Moreover, the beginnings will have been made in the automatic and instantaneous translation of languages, enabling people to understand one another across the barriers of Babel. (David Sarnoff)

Remember the message of the Master, "Go into all the world and preach the gospel to every creature"? Sarnoff says science will provide the vehicle and make it possible to do just that, because we can stand in Salt Lake and talk to all the world, and regardless of their languages they will understand what we say and thus the world become prepared for the coming of the Son of God... My brethren and sisters, be prepared. All of this will happen. But before it does and while it is happening we are going to have some world-shaking events." (President Hugh B. Brown, "Pre-school Conference Address", BYU, Sept. 11, 1961.)

I believe that the Lord is anxious to put into our hands inventions of which we laymen have hardly had a glimpse.... He will open the gates and make possible the proselyting. Of that, I have great faith.... (President Spencer W. Kimball, Ensign, October, 1974)

The fulfillment of those prophecies is the mission of the Translation Sciences Institute in partnership with the Church Dept. of Translation and Distribution.

Since the founding of the Institute at Brigham Young University, we have received support, encouragement, and inspiration from the Church.
In 1972, then President, Harold B. Lee admonished TSI's director, Dr. Eldon Lytle, not to become discouraged, saying, "if you will make the Lord a partner, your computer translation project cannot fail."

In a presentation to the Board of Trustees, President Kimball, as well as President Ezra Taft Benson, reaffirmed the Church's faith in the project and emphasized their high expectations in the program.

President Kimball renewed the charge in his 2nd Century Address to Brigham Young University.

BYU should become the acknowledged language capital of the world... We look forward to developments n your computer-assisted translation projects.... (President Spencer W. Kimball, BYU second century address)

Because of the strategic importance of the TSI project and on the specific recommendation of Elder Robert Hales, (who at that time was over translation and distribution), Dr. Ernest L. Wilkinson recently donated a one half million dollar IBM 370/138 computer to the Translation Sciences Institute. This gift is having a manifestly positive impact on the progress of computer translation.

At the time of this gift, a board was created with representation from the office of the Church Commissioner of Education, BYU, TSD, and Materials Management to coordinate BYU research as it applies to the Church.

By the end of 1978, the Department of Translation and Distribution's supplemental funding support for our research and development over the past few years will have surpassed $600,000.00. This funding has been vital in assuring the steady and continued development of TSI's work. Currently TSD funding represents 40% of our total budget. We are totally committed to showing the Church and BYU a return on this investment and look forward to continued success and cooperation.

**Phase I Presentation**

Our translation research at the Institute is divided into two phases.

Phase I deals with computer text processing.
Phase II consists of our interactive computer translation program.
Phase I - Text processing

Text processing refers to the capability a computer has to automatically perform tasks formerly done manually by skilled typists, proofreaders, typesetters and printers.

Computer text processing technology is currently in wide use in journalism, industry, and within the Church. TSI has done extensive programming and development to make a text editor suitable to the work of translation, a field where it is still relatively unused.

Traditionally the translation process follows a large number of tedious steps, including rough drafts, several reviews and typings, and proofreading. Experience has shown us that before the manuscript is ready for publication it could be retyped as many as twelve times. Not only is this time- and resource-consuming, but new errors may be unintentionally introduced at any point, especially if the typist is not totally familiar with the language in question.

TSI has taken the work station and developed special features especially needed by the translator. We have developed a custom-made translator editing system for the Church which enables the translator to draft, proofread, edit and correct his translation all in one step, without having to retype his copy. The computer can add, delete or change a letter, word, phrase, sentence or paragraph at the translator's command. It can format the text giving it proper spacing, even margins, page numbers, indentation, and other special features. TSI has done extensive software development in special formatting features, diacritical marks for foreign languages and typesetting routines for various languages. We use terminals connected to the Wilkinson computer or small, self contained units such as the Hewlett Packard work station.

Our Text Processing programs have enabled the Church to produce the following major works:

-Aymara Book of Mormon
-Topical Guide to the Scriptures

TSI text processing is currently in use in the following Lamanite languages:

1. Aymara
2. Cakchiquel
3. Quiche
4. Quichua
5. Quechua

We have been able to reduce significantly the time and cost of Book of Mormon translation in these languages:

1978

Languages and Linguistics Symposium
Time Comparison
Manual vs. Computer Test Processing
of the Book of Mormon

Years

Manual Translation

TSI

0

3

4

42.5 mon.
typesetting
proofreading
typing
review
typing
review
typing
review
translation
training

typesetting
review
translation
review
Cost Comparison
Manual vs. Computer Text Processing
of the Book of Mormon

Manual Translation

- Typesetting: $33,600
- Proofreading
- Typings
- Reviews
- Translation: $20,050

TSI

- Typesetting
- Reviews
- Translation
We have the capability now to aid Church translation in many of the current emerging languages with our automatic text processing programs on the Wilkinson computer. Without investments in any new equipment we could accommodate up to twelve languages by going to double shifts as outlined by the BYU and the Church at the time Dr. Wilkinson made this gift.

Of the approximately 250 priority languages, about half make use of a romanized alphabet for which we now have the capability to process up to the printing stage. Development of a special print wheel at a cost of under $3,000 would enable BYU Press to print any of the 125 languages.

With research in the area of special characters we could provide text processing for an even greater number of languages. Work is already underway in Chinese, and a major accomplishment has not been achieved with the capability to print 10,000 Chinese characters using a Versatec printer.

We now have the technology to adapt a work station for foreign language and install it in the field. Text processing systems which are compatible with Phase II computer translations will be needed at regional centers for post editing purposes. We look forward to working together to help put this valuable tool into the hands of our Church translators throughout the world.

**PHASE II**

**TSI/BYU INTERACTIVE COMPUTER TRANSLATION**

A program uniquely suited for Church needs.

The main features that set the TSI translation system apart from other computer-assisted programs are:

1. **Human interaction.** Our translation is interactive because the machine and human work together combining the advantages of both. In order to get high quality computer translation we have to acknowledge the limitations of the computer and compensate for these with human intervention. It is essential in understanding the meaning of a sentence that a human interact with the computer.

For example, in the sentence, "he flipped the coin on the table," there are at least four possible meanings:

(1) He flipped the coin **onto** the table.
(2) He flipped the coin that was on the table (as opposed to some other coin).

(3) The coin was on the table when he flipped it.

(4) He was on the table when he flipped the coin.

A computer would have a difficult time determining which of these meanings was intended. A human would normally know from the context.

2. Universal Semantic Code. Once the meaning is determined, there must be a way to represent that meaning in the computer. The human brain appears to be wired the same for everyone. Even though we may speak different languages, at a conceptual level we all utilize a universal code for handling information. All men share many concepts; each language may label the concepts differently.

3. Junction Grammar. The mathematical way we have of representing the semantic code is called Junction Grammar and was developed by our director, Dr. Lytle. It enables us to represent meaning in precise, mathematical terms in the computer. Going back to the example of the coin on the table, there would be a different Junction Grammar representation for each of the possible meanings represented by one ambiguous sentence in English.

4. One to many. We can analyze the English once and then produce translations in any number of languages for which we have synthesis programs.

5. Vocabulary. We project a programmed vocabulary in excess of 30,000 word senses by 1979.

ADVANTAGES OF THE ONE TO MANY SYSTEM.

Paraphrase translation (what most humans do) requires a separate analysis and interpretation for each language being translated. There are disadvantages to this approach. For example, the original text is subject to many interpretations by non-native speakers of English; because of this, various translations of the same text may not be consistent with each other and may not say what the original said.

These problems are overcome in interactive computer Translation because there is only one analysis of the original, and that by a native speaker of English. All of the various language versions will be consistent with each other, and if a mistake is detected in one version, it can
be readily corrected in all versions. There will also be an accurate transfer of information because the computer forces the human to analyze the meaning more closely, as in the "flipped coin" example. The machine forces us to account for every structure, every grammatical relationship.

ADVANTAGES OF HUMAN INTERACTION

Paraphrase translation which is practiced by the majority of human translators, follows the Diversity Theorem, which, simply stated, is that each person speaks differently. Within any given language there are dialects and subdialects, and within dialects each individual has his own manner of speaking, or idiolect. Each translation reflects the translator's unique dialect and personal language habits. Just as all of us possess a unique fingerprint, it now appears that we each have a unique "language print".

Because of this, translation reviewers tend to change the translation to agree with their own dialect and idiolect—a major problem in Spanish translation for Latin America because what a Mexican translates may not satisfy a Peruvian. Often changes are made in translations for no other reason than "I wouldn't say it that way." This tendency in review to change translation solely on a basis of personal preference could, and often does, lead to a series of revisions which, if not controlled, will result in a combinatorial explosion—the "revised edition" syndrome.

Paraphrase translation is characterized by information loss, as well. The translator often interprets text in his own way. He also may not be aware of certain information in the source. When he synthesizes a translation information may be lost. Analysis of human translation both in and out of the Church has shown this to be a widespread phenomenon.

Consider the following examples:

ENGLISH: A deacon must be morally clean and pure in thought. He would never violate the wisdom or be involved in drug abuse. — Bishop Vaughn J. Featherstone, from "The Role of the Deacon."

SPANISH BACK TRANSLATION: ...would never break the word of wisdom or take drugs.

How does Interactive Computer Translation help overcome some of the traditional problems of paraphrase translation? Interactive Computer Translation output does not correspond to a given dialect or idiolect, but is intelligible to all speakers because of the input theorem, which states:
You understand more than you speak. That is, our capacity to decode is greater than our capacity to encode. That is why even though we may speak a given idiolect of a given dialect, our capacity to understand bridges many idiolects, subdialects and dialects. So, even though the computer translation output does not correspond to a given dialect, it will be understandable. The Book of Mormon is a good example of this principle. Even though it does not correspond to a given dialect of English, it is understood by many.

Interactive Computer Translation will thus serve many dialects and control the combinatorial explosion by supplying one translation intelligible by all. The computer translation will help control information loss because it will be highly accurate. However, it will not be as "pretty" as paraphrase translation. It will need some post editing by a native of the target language to smooth out the rough edges.

Time/Cost Benefits of TSI Computer Translation

Computer translation will be twice as efficient as manual translation going into four languages. By adding the advantages of both Phase I and Phase II, tremendous gains can be realized. (See graphs on following two pages.)
Time Comparison
Manual vs. Computer-assisted Translation
With Phases I & II

Years

0

1

2

3

4

Manual

Phase II

Phase II \( \frac{1}{4} \) Total Phase I

Languages and Linguistics Symposium 1978
Time/Cost Benefits of One-to-Many Formal Translation

Languages

At 16 Ratio = 5:16
6:20
Current Status

We are on or ahead of schedule as we near 1979. Our Phase II output was judged to be over 90% accurate by Sperry Univac scientists. James Melnick, a consultant from Harvard, gave TSI the highest rating in his survey of machine translation projects. We have made major breakthroughs and our expectations are high that the project will attain the desired level of performance.

Projections

The system will be ready for production by mid 1979 on a limited basis. At that time the system will be "field tested" and logistical and interface problems will be resolved. Additional funding will be needed to continue research to perfect the system and to add new languages.

Conclusion: Interactive Computer Translation combines the best of both worlds.

By taking advantage of those things which the computer can do best and which the human can do best we can produce translation which is better, faster and more cost efficient than what either could do alone.
AN INTRODUCTION TO THE REFERMENT
AND SOME OTHER INNOVATIONS

Jill E. Peterson

In Junction Grammar, semantic units of various types are related to each other by means of junction operations. There are three basic operations: adjunction, subjunction, and conjunction. Each has a different function in the structure of a sentence.

**Adjunction**

Adjunction (+) can be viewed as the most fundamental operation. It joins the subject of a statement to its predicate, and, within the predicate, the predicator to its object. In other words, it forms the basic structure of a well-formed sentence.

```
SX statement
  subject Y + PX predicate
     predicator X + Z object
```

*Figure 1. Basic adjunctive template*

The predicator of a statement is usually verbal, but it may also be adjectival, adverbial, or prepositional. A statement with a verbal core is just a simple sentence. A statement with a core element of some other category seems to carry some special emotive force in English.
Figure 2. Examples of adjunctive templates

Subjunction

Obviously, there is much more to a sentence than the adjunctive template just discussed. Actually, each node in the adjunctive template consists of a group of nodes called a referment. Here the nodes are joined together by means of subjunction (*). No matter what the category, the basic structure of a referment is the same.

\[
\text{X referment} \quad \text{modalizer} \quad \text{X} \quad \text{aggregate} \quad \text{quantifier} \quad \text{X} \quad \text{classifier}
\]

Figure 3. Basic referment

To illustrate the role played by each node in the referment, it is helpful to consider an example noun phrase.

(1) the two little girls that we saw

A classifier represents a class of referents. In this case, the classifier is girls, referring to the class of all girls. In the phrase above, girls is modified by the adjectival little, creating a subclass of little girls within the broader class of girls. A quantifier defines the scope of the referent and identifies the data type (as count/mass,
for example). Out of the subclass of little girls, two individuals are being referred to. The clausal modifier that we saw, finally specifies exactly which two little girls. A modalizer provides context-sensitive information not inherent in that which it modalizes, but which is vital to the discourse environment. In this case, the indicates that the referent is third person and contains recovery information, i.e., information available to both the speaker and hearer in this particular discourse environment. Given this information, the referent for the above phrase would be structured thus:

![Diagram of noun referment]

Figure 4. Example noun referment

Notice that the modifier little which created the subclass little girls, is interjoined directly to the classifier, while the clausal modifier that we saw, which specified precisely which little girls, is interjoined to the aggregate. This distinction of where the modifier is interjoined is used in Junction Grammar to distinguish generic references from specific references. The phrase a happy child could be either generic or specific. If it is generic, the speaker has no particular child in mind.

(2) A happy child is a delight to behold.
Figure 5. A generic noun referment, which has no Ni node

Here, there is no modifier interjoined to the aggregate. If there were a modifier (even an implied one), the reference would be to some specific child.

(3) A happy child (that I met today) gave me a flower.

Figure 6. A specific noun referment having an implied specific modifier

The modifier which makes the referment specific does not necessarily have to be interjoined, nor does it have to be a node of the same category. An example of a subjoined modifier of a different category would be:

(4) The fact that he came surprised me.

Here, the SV that he came is the fact in question and can be subjoined directly into the Ni position of the referment.
Now that the general function of each node in the referment has been described, these basic principles can be applied to V and PV referments as well. The verb classifier is the verb itself, except for be and have, which are modalizers, since their primary function is to carry tense. The quantifier carries information about the data type of the verb. (Verbs also have properties similar to the count/mass distinction on nouns.) The modalizer carries information pertaining to tense. This is context-sensitive in that the tense one uses depends upon when a statement is made in relation to the event under discussion -- before, during, or after. And, of course, a verb can have generic and/or specific modifiers as in this sentence:

(5) Julie ran away from home.
A PV referment carries yet other information. Its modalizer gives a fault specification for the predicate, indicating whether or not the subject is directly and willfully responsible for the action described by the predicate. The quantifier gives information about the aspect of the PV (perfective, imperfective, etc.). The classifier is the PV itself. A modifier on the aggregate indicates that some specific event(s) are being referred to.

(6) Molly bumped into Karilee (on purpose).

Figure 8. Example verb referment

Figure 9. Example PV referment
Conjunction

The third junction operation, conjunction (\&), is used to link any structures of the same category, such that both structures have the same function within a larger structure. Any like categories may be conjoined.

(7) a. red or green
    b. not boys, but girls
    c. have your cake and eat it, too
    d. my friend and neighbor

Specializing the Operations

The operations discussed above represent the three basic types of operations used in Junction Grammar. However, each type is specialized in certain instances to perform certain specific functions. For example, the subjunction joining the modalizer to the referment is specialized as either an entry or a recovery operation. Recovery means that the information contained in the referment is known to both the speaker and the hearer in the discourse environment, as mentioned in connection with a previous example. Entry means that the information is new to the hearer and will need to be entered into his information net. Conjunction may be specialized according to which conjunction is used: and, but, or, etc. Adjunction may be specialized according to the role played by the subject and object(s) in the sentence. This is similar to the concept of "case" as explored by Filmore, in such examples as:

(8) a. The window broke.
    b. The man broke the window with a hammer.
    c. The hammer broke the window.

Here, there are three participants in the event: an agent, the man; an instrument, the hammer; and a patient, the window. Specializations of adjunction can be used to differentiate these roles, since each participant relates to the verb in a different way.

Iteration and Recursion

The three operations can be applied to nodes in two different ways. One option reflects the fact that each node joined by the operation is of equal value. No set/subset relationships are implied. Here are two examples.

(9) a. the big yellow book
    b. bacon, eggs, fruit, and toast for breakfast

In (9.a), **big** and **yellow** are two unrelated, independent attributes of the book. In (9.b), each food mentioned
stands independently of the others. The structure of these phrases expresses this independence.

Figure 10. Iterative subjunction and conjunction

The second option, recursion, refers to the process by which structures can be cyclically joined several times in succession. This often results in a set/subset type of relationship among the operands. It has proven useful in a number of environments. Modifiers can be recursively inter­joined to their head.

(10) Of all those yellow books on the shelf, hand me the first big yellow book.

Here, the adjectives big and yellow are not modifying book iteratively, as two unrelated qualities of the book, but recursively, with big modifying the composite concept yellow book.

Conjunction may also be recursive.

(11) bacon and eggs, fruit, and toast for breakfast

Here, bacon and eggs is seen as a unit conjoined recursively to fruit and toast. Referments can also be recursively embedded one within another.

(12) The fact that he came surprised us.

Here, that he came is the fact in question. These recursive structures have long been part of Junction Grammar.
Recently, recursive adjunction has also been incorporated into the system. Specifically, it is used when a verb seems to take more than one object, as, for example, a direct object and an indirect object without a preposition.

(13) He gave her the book.

Previously, this sentence has been diagrammed using a prepositional phrase with its preposition hiatused. By allowing recursive adjunction the sentence can be handled with a verb having recursively adjoined objects, with the adjunction specialized to show what type of object it is.

Even more recently than the initial writing of this volume

Languages and Linguistics Symposium 1978
paper, yet another proposal has been made to handle such structures. It is possible that both objects could be adjoined directly to the verb, but not iteratively, because different types of objects are involved. The new proposal suggests that the objects be represented not in just two dimensions, as has always been done in the past, but in three dimensions, with each objects adjoined directly to the verb, but each object would be in a separate dimension, because each relates to the verb in a different way. The idea of three dimensional and even n-dimensional J-trees is an area which needs much further investigation.

This paper has discussed several new developments in Junction Grammar. The full structure of the referment is proving very useful in a variety of contexts. Specialized adjunction and n-dimensional J-trees represent the new frontiers of the science. You'll have to come back to the next symposium for further developments in these areas.
The Information Net in Junction Grammar

A Discovery Aid

Kenneth R. Lee

One of the major influences on discoveries that are made in linguistic research is the view the linguist has of the nature of language. The earliest theories were built on language as an expression of the free will of man. Since this free will was not considered to be subject to the laws of causation, many of the constructs postulated as underlying language could not be tested experimentally. The free will was considered to be rational, however, and therefore concepts underlying a sentence where expected to combine in accordance with the rules of logic.

In the early 1920's the influence of the work of B. F. Skinner and other systems of conditioning changed the view of language to language as a system of stimuli and responses. Methods and theories were restricted by making surface forms the only allowable data, underlying forms were strictly taboo. This freed linguistics from the subjectivity and untestable hypotheses that had plagued it before, making its results and methods more objective, but, as Chomsky noted, the linguistics that developed based on this viewpoint was inadequate to account for many of the phenomena of language. In his theory Chomsky reaffirmed not only the theoretical usefulness, but also the theoretical necessity of underlying forms, however, his formulation considered just one part of part of language -- syntax, and studied language as a static system operating in a vacuum.

Junction Theory's View of Language

In Junction Theory the real world is seen as a first level of representation, that is, the thing represented by the thing itself. From the real world information is extracted and kept as concepts -- a second level of representation. On the conceptual level concepts are related to each other forming a conceptual structure. Language is used to convey something about the conceptual structure to another person, attempting, as it were, to show him the world as the first person views it.

For example, if person A sees a large four-legged animal wagging its tail by a large rock, he may share this perception with person B by saying: "See the big dog over there". Person A, in essence, asks person B to include in his conceptual structure a dog that is big and can be seen
from person B's current location. Person A also indicates a desire that person B orient himself so that he perceives the same thing. Finally person A indicates that the dog is at some distance from himself and person B and that he actually believes the dog is there.

In most contexts person B would look and see the dog for himself. What if person B does not see the dog? One possibility, if person A is a young child who might use the term "dog" differently than most speakers, is that person B would look for an entity that person A might use the term "dog" for, perhaps a horse. If, on the other hand, person B assumes that person A would use the term "dog" the same as he and assumes that person A was sharing an actual perception, (i.e., that person A wasn't lying or telling story), then person B would be expected to respond with a sentence such as "Where?" or "What dog?". In other words, person B would communicate to person A that his perception does not match the perception person A communicated to him.

The Information Net

In the formulation of language proposed by Junction Theory the conceptual structure can be represented by one or more information nets. Junction trees (hereafter called J-trees) encoded into linguistic strings are used to transfer information about the conceptual structure. The purpose of this paper is to demonstrate the usefulness of this view in generating important and productive questions in linguistics theory and to suggest how hypotheses thus formulated might be tested. Some knowledge of Junction Theory is assumed and therefore the structure of J-trees will not be presented in detail nor will details of the structure of the information net. These will be mentioned only as needed to support the purpose of the paper. The reader is referred to the first issue of Junction Theory and Application, specifically the articles by Eldon G. Lytle, if more information about Junction Theory is desired.

Briefly the information net functions as follows. Suppose person A sees a man carrying a cane who is walking along a stream. As the man walks he swings his cane. Let us further suppose the man is a friend of person A named Mortimer. In the information net an instance of walking is related to the man and the walking is located by a stream. The information that the man was carrying a cane would also be indicated, as well as the information that the man was not only carrying the cane, but swinging it also. Finally the man is identified as a particular man whom person A already knows (and presumably has a lot of other information about from past experiences) and who person A identifies as "Mortimer".
The Communication Process

Communication of this information, or some part of it, to another person is represented in Junction Theory as follows. Person A constructs a J-tree according to the information in his information net and his expectation of the structure and content of the other person's information net. This J-tree guides the construction of a linguistic string which is spoken or written. The linguistic string is analyzed by the other person and a J-tree constructed. The J-tree then acts as instructions as to how the other person should set up his information net. An important point to note that the function of the J-tree is to instruct the other person how person A's information net is constructed. The following examples illustrate this point.

Suppose person A meets person B who is a friend of both person A and Mortimer, and person A wants to let person B know he saw their friend. He would say something like "I saw Mortimer by the stream", expecting "Mortimer" to be enough to identify the individual in question to person B. If person B knows two Mortimers he would probably indicate that "Mortimer" is not enough to uniquely identify the individual by asking something like "Which Mortimer?". Person A's answer would presumably add something to further identify the person in question.

Now suppose that the man person A saw was unknown to person B. In this case person A would not expect person B to have any knowledge of the individual in question. The J-tree constructed would produce a sentence such as: "I saw a man by the stream", indicating that person B should set a reference for an individual who is male and relate this to a position by the stream.

Changing the situation again, assume that person B does not know the man, but that person A and person B saw him by the stream before. In this case person A might say: "I saw the man by the stream", expecting person B to know about a man by the stream. The J-tree constructed asks person B to retrieve a reference already entered into person B's information net.

Entry and Recovery and the Information Net

These examples are each examples of identifying an individual to person B. The difference between the second and third examples is traditionally the difference between definite and indefinite reference. In Junction Theory the definite/indefinite distinction is just the indication of the difference of directionality of the modalization junction. A left subjunction corresponds to definite reference and a right subjunction to an indefinite reference.
In his paper "Information Processing Stimulated by Nouns" (Meador, 1977), Lee Meador relates the directionality of the modalizer junction to the processes of entering information into and restoring information from the net. A right subjunction (indefinite reference) indicates the information in the referment is to be used in setting up an entry in the net. A left subjunction (definite reference) indicates that the information in the referment is to be used to locate an entry already in the net. In this case the notion of directionality of subjunction was postulated in Junction Grammar before its use in relation to the net, yet its use in the net strengthens the hypothesis of the existence of the distinction. The ease with which the distinction fits into the new area and the power it gives suggests also that an actual phenomenon of language is represented.

Indirect Objects and the Information Net

In another situation considerations of the structure of the net led to a hypothesis about the structure of J-trees. The author was considering the verb and PV referments, and specifically the place of the indirect object in these referments. At the time indirect objects were expressed in the J-tree as interjunctions in the verb referment. This did not seem correct, yet no convincing evidence could be found to the contrary. Later the role of the verb in the information net was considered. From this it seemed reasonable that the verb represents a process and that the PV represents the linkage of this process, a subject, a direct object (if one existed), and an indirect object (if one existed).

Adjunctions seem to indicate a linking in the net, and, as expected, the direct object is expressed as a noun referment in an adjunction in the PV. The indirect object, as already noted, was expressed as an interjunction in the verb referment. Interjunctions seem to represent addition of information, often to restrict the scope of a referment that identifies the entry (or entries) in the net. Expressing the indirect object as an interjunction in the verb referment claims that the indirect object restricts the scope of the verb referment. This restriction was claimed to be the "direction" of the process expressed by the verb towards the recipient of the process.

From their role in the information net it seemed that the both the direct and indirect objects should be adjunctions in the PV. Because of this the notion of the "directionality" of the indirect object was re-examined. It was noted that the same sort of "directionality" is found in the sentence pair: "I gave him the book" and "He gave me the book" as is found in the sentence pair: "I saw him" and "He saw me" and, if books are allowed to own people, as in the
sentence pair: "I gave him the book" and "I gave the book him". This evidence was convincing that the indirect object and direct object do need to be handled in a similar manner as had been suggested by their role in the information net. Consequently the hypothesis was made that both the direct and indirect objects are expressed as adjunctions in the PV. (Unknown to the author, this result had previously been reached by Eldon Lytle).

Other Areas of Inquiry and the Information Net

The information net would also be helpful in exploring the possibility that the traditional parts of speech (verbs, nouns, etc.) may be manifestations of different data types. Lee Meador's paper made the assumption that those things described as nouns could be handled as arrays and elements of arrays. Adjectives and adverbs seem to be well represented by variables (some allowing only discrete values while others allow a continuous range of values). Nominalizations and related linguistic phenomena would be a change from one data type to another. The manner in which the parts of speech function in the net, and especially the manner in which nominalizations function could very well provide support for or discount this hypothesis, or suggest ways to test this hypothesis.

Direct reference would be another area where the concept of the information net could be useful. In the first example of the three examples given above, the individual in question is identified to person B by direct reference through the term "Mortimer", much like the term "dog" refers to a furry quadruped of a certain kind, while in the other two examples the individual is identified by giving some of his characteristics and arriving at the entry from these. The question of direct reference would be important in the net. The manner in which it is resolved should lead to claims as to how it would be expressed in J-trees and to how it would be expected to function in language.

Simulation of the Information Net

Thus far the information net has only been semi-formalized; there are many questions yet to be answered. One major problem in linguistic research is that "obvious" information is often filled in by the researcher, many times unconsciously. This would be a special problem in working with the information net since the phenomena considered generally are unconscious, or at best, semi-conscious. For this reason the use of computers to simulate the information net is advisable. The use of the computer forces the formalizations of the researcher to be precise. Areas of imprecision would be
identified in the programming of the computer or appear as invalid forms or as valid forms that cannot be generated. In this way new areas of inquiry would be uncovered, presumably not only for the information net, but also for the structure of the J-tree.

Once a system to simulate an information net is constructed and the rules for constructing J-trees from the information in the net, it would be possible to test the adequacy of the Junction Theory representation of the communication process as well as to advance discourse analysis, the use of contextual information in the translation process, and other areas.

Some Cautions

There is a pitfall in the approach to language outlined in this paper to guard against -- that one part of the formulation not be subjected to verification by language as it actually is used. Since there is another part to the formulation, a cherished idea can be protected by blaming inconsistencies with actual linguistic phenomena on the other part. The researcher must also leave himself open to the possibility that the failure of a particular part of theory is not due to either part, but that the underlying concept is false, although it is believed and appears reasonable that when one part leads to a false hypothesis, the other will point toward a more correct hypothesis. Finally, if the information net is simulated on the computer, the researcher must take into account the possibility that the program does not accurately simulate the process postulated. The best hypothesis will produce no valid results if the hypothesis is not represented by the program.

Summary

The view a researcher in linguistics has about language effects the discoveries he may make. The view of language in Junction Theory has been useful in illuminating several problems in linguistics and holds the promise of discovering the solutions to several others. The results of formalizing the structure and functioning of the information net holds the promise to illuminate problems in other areas as well. There is still much that can be done with the information net before the limits of its usefulness can be assessed.


