5. Significance for General Understanding.

A good-hearted person, anxious to help toward the unification of mankind, wondered if this business of comparing languages and cultures did not tend to divide. Was it not better to ignore the differences, she thought. Were we not all the same fundamentally?

Certainly I believe that we are all one flock, that we are the same fundamentally. But because human personality has evolved a variety of ways to live, ways that we call cultures, we constantly misinterpret each other across cultures. If we ignore these cultural differences we will misjudge our cultural neighbors — as we constantly do at present — for a form of behavior that to them has one meaning may have another one to us. And if we do not know of the difference in meaning we will ascribe to our neighbors the intentions that the same behavior would imply for us, and would pass on them the same judgment as on our confreres. In fact, I am afraid that we do exactly that in most cases at present.

If, on the other hand, we know that an item of behavior has a different meaning in the other culture we will not misunderstand. And we will have a chance to understand ourselves and what we do much better as a result. We will be able to establish genuine habits of tolerance, rather than naive good intentions that crumble the first time our cultural neighbor does something which is perfectly all right in his culture but strange or misleading in ours. In visiting a foreign country we will actually be able to enter into its life and understand and be understood.

Again, in the realm of language rather than that of culture as such, the harm that we do our students by not teaching them a foreign language or by teaching it as if it were just different words from those of our own language lies in the false idea they will hold of what it means to learn a foreign language. They will never be ready to struggle to pronounce things in different sound units, different intonation, different rhythm and stress, different constructions, and even different units of meaning unless they realize that this is exactly what's involved in learning a foreign language, and that although learning those things will require effort, often dull and uninteresting, the rewards for the effort will be great.

We have explored some of the many contributions that systematic comparison of native and foreign language and culture can make to education and research. The following chapters present working techniques to carry out specific comparisons of two systems of pronunciation, grammatical structure, vocabulary, writing, and cultural behavior.

Chapter 2

HOW TO COMPARE TWO SOUND SYSTEMS

1. Introduction.

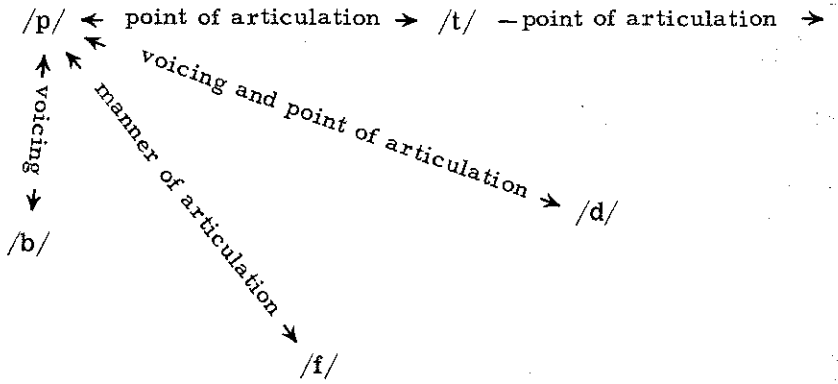
1.1 *The phoneme*. It is important to keep in mind that the sounds of human language are more than just sound. The *p* of *pin* is exploded with a puff of air following it, whereas the *p* of *capture* is not. Those two sounds are quite different as mere sound. But in English we say they are the "same," and they are, because they function as the same unit in the sound system of English. These functioning units like English /p/ are called *phonemes* by structural linguists and usually will be enclosed in slant bars in the text.

1.2 *Phonemes are not letters*. Sometimes a letter of the alphabet may represent a phoneme, as the *p* in *pin* and *capture*, but a phoneme is never a letter; it is a unit of sound. Chinese does not have letters, yet it has phonemes. And even the letter *p* does not always represent the phoneme /p/ in English. Take for example the letter *p* in *telephone*. It certainly does not represent the phoneme /p/ there. Phonemes are units of sound that exist in all the languages we know, whether or not they have ever been written.

1.3 *Phonemic versus non-phonemic differences*. Is it not a paradox that two sounds which are different as sound, for example the *p*'s in *pin* and *capture*, are considered the "same" phoneme? It may seem so, but it is quite easy to understand if we realize that there are two kinds of differences in the sounds of a language. One kind is represented by the difference between the exploded, aspirated *p* of *pin* and the unexploded *p* of *capture*. This difference is never used in English to distinguish any two words. Even if we artificially pronounce *capture* with the *p* of *pin*, it will remain the same word. We will call that kind of difference *non-phonemic* or non-significant. The other kind of difference is represented by the phonemes /p/ and /b/ in *pin* and *bin* for example. This difference is constantly used in English to distinguish words. We call it a *phonemic* difference. All languages have hundreds or even thousands of non-phonemic differences. On the other hand, any one language has a relatively small number of phonemic distinctions.

The clear understanding of phonemic differences is the contribution of modern structural linguistics. This level of analysis, the phonemic level, is the "new" thing in the study of the sound systems of languages.

1.4 *A sound system.* A phoneme is a complex unit in the system of a language. The English phoneme /p/, for example, contrasts minimally with /b/ in the pair *roping* and *robing* and many others. In that particular pair, the voicing of /b/ is the dominant feature of difference – in /b/ the vocal chords continue to vibrate to produce voicing, while in /p/ they are silent for a split second. The same phoneme /p/ contrasts minimally with /f/ not by voicing but principally by manner of articulation in the pair *dipper: differ*. A difference in point of articulation accompanies the contrast but does not decide it. The same phoneme /p/ contrasts minimally with /t/ not by voicing or manner of articulation but by point of articulation. Other contrasts such as /p/ and /m/, /p/ and /k/ depend on still other features of articulation. The point is that English /p/ is part of a system of contrasts which are peculiar to English and which operate now in one direction, now in another. We would really need a many-dimensional model to represent all these interacting contrasts. The phonemic field of English /p/ might be partly represented by a figure such as the one that follows.



1.5 *A system of habits.* The amazing thing is that a normal speaker of a language uses this complex system of contrasts with great speed and the greatest of ease. He is not even aware in most instances that he is using such a system. This feat can be accomplished by reducing most of the operation of the system to automatic or semi-automatic habits.

1.6 *Great strength of the system.* Probably because the use of the sound system of a language operates as a system of automatic and semi-automatic habits, it is extremely difficult to change anything in that system. There is an unbelievably strong force binding the units – the phonemes – of any language in their complex of contrasts. The adult speaker of one language cannot easily pronounce language sounds of another even though he has no speech impediment, and what is even more startling, he cannot easily hear language sounds other than those of his native language even though he suffers no hearing defect.

1.7 *Transfer of native sound system.* We have ample evidence that when learning a foreign language we tend to transfer our entire native language system in the process. We tend to transfer to that language our phonemes and their variants, our stress and rhythm patterns, our transitions, our intonation patterns and their interaction with other phonemes.

Production distortions. Thus we can understand the widely observed fact that the pronunciation of a German speaker learning English is quite noticeably different from that of a Spanish speaker learning English, and both are quite different from that of a Chinese speaker learning the same variety of English. And we understand further that the distortions in the English pronunciation of a German speaker will bear great similarity to the distortions of other German speakers, just as the distortions in the English pronunciation of a Spanish or Chinese speaker are similar to those of other speakers of the same language.

Perception blind spots. Much less known, and often not even suspected, may be the fact mentioned above that the speaker of one language listening to another does not actually hear the foreign language sound units – phonemes. He hears his own. Phonemic differences in the foreign language will be consistently missed by him if there is no similar phonemic difference in his native language. The Thai language makes a phonemic distinction between aspirated and unaspirated *p*. In English that difference is not phonemic, and as a result English speakers learning Thai usually do not hear the difference between the two *p* sounds in Thai.

1.8 *Comparison of sound systems.* We now see more clearly the need for comparing the native and the foreign sound systems as a means of predicting and describing the pronunciation problems of the speakers of a given language learning another.

Since the transfer is usually in one direction, from the native language to the foreign language, an analysis with English as the

foreign language is not the same as one with English as the native language.

1.9 *Applications*. Even though the process of comparing two sound systems must of necessity be tedious, dry, and abstract, the results obtained are of great practical use for the preparation of textbooks, tests, and exercises to supplement inadequate materials, and for the evaluation of materials and the diagnosis of student problems.

And again, even though the work described in the remainder of this chapter may be dry and occasionally difficult, the results when used in actual lesson materials may be made as interesting and challenging as the creativeness of the textbook writer or teacher can make them.

2. Problem Analysis: Sound Segments.

2.1 In learning the sound system of a foreign language one finds sounds that are physically similar to those of the native language, that structure similarly to them, and that are similarly distributed. "Learning" of such phonemes occurs by simple transfer without difficulty. On the other hand, one also finds sounds that are not part of the sound system of the native language, that structure differently, or that are differently distributed. Learning of these occurs more slowly, and difficulty with them is more persistent. In fact, learning of the latter actually means learning the sounds of the language. We therefore seek to find those problems, and we will find them by the structural comparison of the two sound systems.

Such a comparison, if it is to be complete and accurate, involves linguistic manipulations which are not usually described in the literature. I found it helpful to follow certain procedures in handling data which should prove helpful to others. These procedures, however, are not intended as a rigid step-by-step approach but as a simple summing up of the important things involved in such work. They are presented here in three stages: linguistic analysis of sound systems, comparison of sound systems, and description of troublesome contrasts.

2.2 *Analysis of sound systems*. The object here is to find or prepare a linguistic analysis of the sound system of the language to be learned and a similar description of the language of the learner. It is crucial to find good descriptions. As a rule we will not be able to use the descriptions found in ordinary textbooks since, except for those few which have made deliberate use of scientific linguistic data, the descriptions will not be complete or will be inaccurately stated. The descriptions should include segmental phonemes and phonemes of stress, intonation, and juncture or transition. They should include relevant data on the phonetic features of the phonemes and their variants and on their distribution. These data constitute what is generally called the phonology of a language.

2.3 *Comparison of units*. In comparing the sound systems of a foreign language and the native language I find it good safe practice to take up each phoneme separately regardless of any general patterns of difference I may have observed. The comparison of each phoneme should include at least three checks: (1) Does the native language have a phonetically similar phoneme? (2) Are the variants of the phonemes similar in both languages? (3) Are the phonemes and their variants similarly distributed? Let's take up each of these queries separately with segmental phonemes first. Later we will apply the same approach to the phonemes of stress and of intonation.

2.4 *Location and description of segmental problems*. Does the native language have a phonetically similar phoneme? Experience shows that when the foreign language uses a phoneme which does not exist in the learner's native language, that is, when there is no phoneme in the native language that could be transferred to the foreign language and actually function as the phoneme in question, the student will not be able to produce that phoneme readily in learning the foreign language. He will substitute some other phoneme from his native stock. Experience and experiments also show that the learner will have trouble hearing as well as producing the new phoneme.

Let me illustrate. In comparing the sound system of English with that of Portuguese, we would find that Portuguese does not have phonemes that might pass as English /č ǰ θ ð h r y w/ as in *chew, jump, ether, either, hose, rose, year, we're,* respectively. Portuguese speakers will have difficulty pronouncing and hearing these phonemes. We would consider them pronunciation problems.

Similarly, if the comparison is between English and Spanish, we find that Spanish does not have a number of phonemes that are part of the sound system of English. Spanish does not have /v/ as in *vote,* /ð/ as in *then,* /z/ as in *zoo,* /ž/ as in *pleasure,* /š/ as in *shoe,* /ǰ/ as in *jump,* and several of the vowels. These phonemes will be difficult for Spanish speakers to pronounce and to

hear and will therefore constitute important pronunciation problems.[1]

We see that even in learning the same foreign language, English in this case, each linguistic background will have a different set of phonemes representing problems for that group of speakers.

The first phase of comparison, the comparison of the phonemes as units, can be achieved quickly if we have a phonemic chart for each of the two languages, the native and the foreign. For convenience both charts should be based on the same criteria of classification: points of articulation horizontally with front of vocal apparatus to the left of the page; air stream variations vertically, with complete interruption at the top of the page, decreasing to the bottom. This particular arrangement is a convention adopted from the usual practice in diagramming the vocal apparatus facing left.

The preliminary comparison of full phonemes, with or without the aid of phonemic charts, does not give us the complete picture of the pronunciation problems of the student. In fact, it gives a very incomplete picture, since in most cases the problem will not be the total absence of a phoneme in a given language but a problem involving variants of phonemes. We will therefore find it necessary to proceed with the second check: *If the native language has a similar phoneme, is the phonetic shape of its variants similar also?* If it is, the student will have little or no trouble producing that entire phoneme, except for matters of distribution taken up below. Notice that I say "produce." There may still be difficulty in recognizing it in contrast with another phoneme if the other one does not exist in the native language. That problem will be discussed in stage three, below.

If, on the other hand, the phonemes which we tentatively accepted as "similar" have phonetically different variants, we may have located another pronunciation problem.

Problem: In comparing English with Spanish, when first checking English /d/ we might tentatively say that Spanish has a similar phoneme /d/ and therefore not consider it a problem. At the second query, "Are its variants also similar?" we would find that Spanish /d/ has two well-defined variants, a stop variant [d] as in *dos* 'two,' and a fricative variant [đ] as in *lado* 'side.' The situation, then, is more complex than it seemed on first inspection. What we have is a Spanish stop variant [d] which "resembles" English /d/ as in *day*, and a Spanish fricative variant [đ] which resembles English /ð/ as in *they*, two different phonemes in the sound system of English, but only one phoneme in Spanish.

[1] David W. Reed, Robert Lado, and Yao Shen, "The Importance of the Native Language in Foreign Language Learning," *Language Learning*, 1, No. 1 (1948), 17-23.

We know from experience that Spanish speakers will transfer their entire /d/ phoneme into English and therefore automatically produce the [đ] variant between vowels and after /r/, the environments in which it normally occurs in Spanish. Spanish speakers will thus say *lather* instead of *ladder*, *wreathing* instead of *reading*, etc.

We conclude then that the English phoneme /d/, although not a pronunciation problem as a total unit, is in fact a phonemic problem between vowels and after /r/ for Spanish speakers.

As a matter of fact, my experience on the basis of test evidence has been that the kind of problem in which part of a phoneme in the native language can pass as a separate phoneme in the foreign language, and other parts of the same native-language phoneme pass as a different phoneme in the foreign language — that kind of problem is by far the most difficult one to overcome. Difficulty in hearing the English contrast between /d/ and /ð/ is by actual computation of test data one of the most stubborn hearing difficulties for Spanish speakers.

The above observation is not limited to pronunciation matters, but applies to vocabulary and grammatical matters as well. Stated in more general terms, when one significant unit or element in the native language equates bilingually with two significant units in the foreign language we have maximum learning difficulty. In vocabulary, English *to be* corresponds to Spanish *ser* and *estar*, and results in a major problem for English speakers learning Spanish. In grammar, one Spanish question pattern, *¿Quién vino? ¿Dónde vive?* corresponds to two English question patterns, *Who came?* and *Where do you live?* The second of these two patterns constitutes a major hurdle for Spanish speakers learning English.

Returning to our main concern at this time, pronunciation, one may wonder about the limits of the criterion of phonetic similarity between sounds in two languages. When are two sounds to be considered similar? Admittedly there is no clear-cut line separating similar from dissimilar, precisely because sounds that are different in one language may be heard as similar in another, and vice versa. We are able, nevertheless, to use the criterion to advantage by dealing with features of sound which in a variety of languages are found to be significant phonetic components of phonemes. Among these features are vibration of the vocal chords versus nonvibration (voiced versus voiceless sounds), air stream flowing through the mouth, nose, or both (oral, nasal, nasalized

sounds), various kinds of articulation (stops, fricatives, affricates, etc.), various points of articulation (bilabial, labio-dental, dental, alveolar, palatal, velar, etc.).[2] The phonemic analysis that we need should include such phonetic data. It should list the phonemes, the phonetic features of the phonemes, and the principal variants and their distribution.

In general we will be able to complete our comparison on the basis of these descriptions. Occasionally, however, we may encounter differences in the theoretical analysis that on further observation turn out to be of no importance. For example, the point of articulation of Spanish /d/ is the inside of the front teeth — the tongue tip makes a fairly wide contact with the back of the front teeth. The point of articulation of English /d/ is the alveolar ridge above and behind the front teeth. At an early stage in the comparison one might decide that this difference in articulation is such that Spanish /d/, even the stop variant, will not function as English /d/. Experience, however, shows that it does, and that this difference in point of articulation is heard as a matter of "accent," Spanish accent, that does not change any word in the language. A reanalysis of the difference shows that dental versus alveolar articulation is never used in English as the only contrastive difference between phonemes: alveolar fricatives /s/ and /z/ are grooved sibilants — the tongue tip forms a groove with the alveolar ridge rather than lying flat against it; English interdentals are fricatives, not sibilants. The contrast involves the type of articulation, not just the point of articulation. We understand then how the stop variant of Spanish /d/ can and does function as English /d/ when Spanish speakers transfer it to English.

The above observation can be handled by expanding the question on similarity of variants, or by adding the question, "If the variants are different in the two languages, will they result in a different structural interpretation for each language?" In the problem just discussed, the answer would be that English /d/ and the stop variant of Spanish /d/ are different, but their structural interpretation would be the same, that is, they would both be interpreted as the phoneme /d/.

Even when we do not find any problem as a result of the first two queries, we may discover a pronunciation problem when we apply the third check: *Is the phoneme similarly distributed?*

[2] For a fuller description of phonetics in connection with phonemic analysis see Kenneth L. Pike, *Phonemics* (Ann Arbor: Univ. Mich. Press, 1947), Chaps. 1 and 2. See also phonetics in Bernard Bloch and George L. Trager, *Outline of Linguistic Analysis* (Baltimore: Linguistic Society of America, 1942).

Again we know from experience that even when the native language has a similar phoneme and the variants are similar, if it does not occur in the same position as in the native language, the student will have trouble producing and hearing it in the position in which it does occur in the foreign language.

Problem: In comparing French with English we would find that French /ž/ as in *jamais* has a parallel English phoneme /ž/ as in *measure*. We would find that its variants would not cause any particular difficulty. But in asking the third question (Is the phoneme similarly distributed?) we would notice that in French it appears at the beginning of words and in English it does not. English speakers will transfer their /ž/ phoneme with its limitations into French and will thus have difficulty with learning the word initial /ž/ in that language.

2.5 *Sequences of sounds.* By following through on this matter of distribution of each phoneme we would eventually locate all the sequences of phonemes that might cause difficulty. However, it may be more economical to compare syllable structure and any other sequence or distributional unit that may be significant in the languages involved. Distribution patterns may correlate with syllables, morphemes, words, position of stress, etc.

Example: Final consonant clusters in English are troublesome to many non-English speakers. Word final /-rd/ is frequent in English but nonexistent in Spanish, for example. A Spanish speaker therefore tends to say *car* for *card, beer* for *beard, her* for *heard*, etc. If we list this problem under the phoneme /d/ we will clutter up our analysis unduly, for we would also have to list /-ld -nd -zd -rld -bd -gd -ǰd -vd / etc. It is more economical and accurate to analyze the matter as a sequence problem.

As a sequence problem we observe that English has a large number of consonant clusters preceding final pause or internal open juncture. We observe also that Spanish permits very few consonants and no clusters before final pause and before open juncture. The problem then is not limited to /-rd/. The student will hear and produce *card, cart, Carl, carp, cars* all as *car*.

2.6 *The analysis of sequence problems.* At first glance the simplest way to analyze sequence problems in pronunciation would seem to be listing sequences in the foreign language and checking to see if they occur in the native language. If they do occur in the native language, they will presumably not be problems as sequences; if they do not occur in the native language, they will constitute pronunciation problems. /θr/ as in *three* occurs in English but does not occur in Spanish, for example. We can assume that /θr/ will constitute a problem for Spanish speakers learning English.

Experience shows, however, that difficulty does not depend exclusively on the sequence itself but also on the position in which the sequence occurs. /sp/, /sk/, and /st/ occur in both English and Spanish. Yet in English they occur word-initially, while in Spanish they are always preceded by a vowel. Compare English *spy, school, student* and Spanish *espía, escuela, estudiante,* etc. Even though the sequences occur in Spanish, because they do not occur initially we can assume that Spanish speakers will have difficulty pronouncing them word-initially in English.

Further analysis reveals that in English /sp/, /sk/, and /st/ occur initially in a syllable, whereas in Spanish the /s/ belongs to one syllable and the /p/, /t/, or /k/ to another, thus: *es-pía, es-cuela, es-tudiante.* The problem may now be described as difficulty with syllable-initial clusters /sp/, /sk/, and /st/ because in the native language such syllable clusters do not occur.[3] This difficulty is easily confirmed by observing the speech of Spanish speakers learning English.

It is obvious that we must consider the distributional positions of sound clusters in order to analyze adequately the pronunciation problems involved in them. The distributional units which are relevant on the basis of experience with many languages are the utterance, the word, the morpheme, and the syllable. Other phenomena which may often add to or replace these distributional units are stress and juncture or transition. Some linguists have sought to simplify this type of analysis when describing single languages by recognizing only the utterance as a distributional unit and admitting only utterance initial, utterance medial, and utterance final positions in their description. This restriction is arbitrary and does not account for the facts of many languages. Compare for example the /sp/ pattern mentioned above. If the description states only that /sp/ occurs in utterance initial, utterance medial, and utterance final positions in English, whereas in Spanish it occurs only in utterance medial position, the conclusion that the Spanish speaker's difficulty would be in utterance initial and utterance final positions, and not in utterance medial, would turn out to be false. The Spanish speaker will have difficulty with that cluster whenever it occurs in the same syllable, even in utterance medial position.

In summary then, to locate and describe sequence problems, we compare the sequences and the positions in which they occur.

[3] If we define syllable transition as a phonemic entity in Spanish, symbolizing it with /-/, we might also say that the sequences /sp/, /sk/, /st/ do not occur in Spanish, since we would have /s-p/, /s-k/, and /s-t/ instead.

When the native language does not have a sequence, or when a sequence does not occur in a position in which it does occur in the foreign language, we will have located a problem.

When all the problems have been located and described it will be more economical and more meaningful in presentation if instead of simply listing the problems as items they are grouped and classified into patterns. Thus /sp/, /sk/, /st/ are not really separate problems but three special cases of one problem: /s/ + consonant (p t k f m n l) in close transition within the same syllable.

2.7 *Difficulty in pronouncing a phoneme versus difficulty in pronouncing a sequence.* When we find a sequence in which one of the phonemes of the foreign language is not to be found in the native language, we of course could simply list the matter as a sequence problem. But this would be an incomplete statement since we know that the phoneme itself will be a problem. Such a problem should be listed as a phoneme problem, and as a sequence one.

2.8 *Difficulty in pronouncing a word versus difficulty in pronouncing a phoneme or a phoneme sequence.* Sometimes a student mispronounces a word although he has mastered the phonemes and sequences involved. The very fact of the pronunciation difficulty being limited to that word indicates that the problem is not one of mastering the sound system but simply a matter of not knowing how to pronounce that word. Even if the word were of high frequency we would not be interested in it in a list of pronunciation problems. It is really a vocabulary problem.

Problem: A student mispronounces the word *hiccough* omitting the final /p/ and substituting vowels other than /ɪ/ and /ə/. The problem is to find out if these mispronunciations are due to lack of control of the phonemes or lack of knowledge of this particular word. If he can pronounce the word *cup,* which includes medial /ə/ and final /p/, and other words involving those same sounds, and if he pronounces medial /ɪ/ as in *hip, hic, stick,* we conclude that it is not a matter of pronouncing these phonemes or these sequences but a matter of not knowing the word *hiccough.* In a teaching situation we would proceed to teach the word. In a list of pronunciation problems we simply leave it out.

2.9 *Problems of spelling pronunciation.* In languages with writing systems that in some way represent sounds, the student often mispronounces words because of influences from those writing systems. When both the foreign language and the native

language use the same alphabet, the problem may be traceable to one of two possible causes. One possibility is that the same symbol might represent two different sounds in the two languages. In such a case the student tends to transfer the native language symbolization to the foreign language.

Problem: An English speaker studying Spanish will sometimes pronounce the family name *Jiménez* as /ǰímɪnɪz/. As far as the sound systems are concerned he should have no difficulty in pronouncing /himénɛθ(~s)/ as it would be pronounced in Spanish. But the initial letter *J* so often represents the sound /ǰ/ as in *Jim* in English that he transfers that representation to Spanish. He also tends to transfer the representation of the final letter *z*, which often represents the consonant sound /z/ as in *zoo* in English. The changes in the vowels follow English unstressed vowel patterns once the stress is shifted to the first syllable.

Problem: A slight variation of the same problem appears in the Spanish word *hijo* 'son,' usually pronounced /íxo/ or /ího/. English speakers sometimes pronounce it /háɪǰo/. The letter *h* represents no sound at all in Modern Spanish, but English speakers tend to give it the value it has in English. The letter *i* often represents the diphthong /aɪ/ in English, especially preceding a single consonant followed by *e* as in *five, time, file, dime,* etc. The letter *j* represents the sound /ǰ/, as already mentioned. We thus see that the seemingly arbitrary pronunciation of *hijo* as /háɪǰo/ resulted from transfer of the English spelling symbolization to Spanish.

The other possibility of spelling interference with pronunciation arises with inconsistencies in the spelling of the foreign language. The symbol which in one word represents one sound turns out to represent a different sound in another word. The student mispronounces the word by assuming that the symbol represents the same sound in both cases.

Problem: Any student learning English might pronounce the words *honest, hour, honor* with an initial /h/ sound, when of course there is no /h/ in their pronunciation. The student may have simply generalized on the basis of the many words in which an initial letter *h* does represent an initial sound /h/. The false extension might be summarized as follows: *h* = /h/ in *hat, house, have, hand, head, hot,* etc., therefore *h* = /h/ in *honest, hour, honor.*

Conclusion: These are not pronunciation problems; they are spelling problems. If they apply to just one word, or a couple of them, they may more effectively be considered vocabulary matters. If they apply to a large number of words they may be considered and described as a pattern of spelling mispronunciation and listed as such.

In languages such as Chinese, which do not use letters but morpheme or word symbols, the problems will arise at the morpheme level rather than at the phoneme level.

2.10 *Pronunciation problems with words that show similarity in two languages.* Since words that are similar in form in two languages show patterns of correspondences between the foreign language and the native one, the student's mispronunciations will often be predictable in terms of those patterns.

Problem: The Spanish words *pino, fino, vino, signo, benigno,* etc. are cognate with English *pine, fine, wine, sign, benign,* etc. The same letter, *i,* represents the sound /i/ in Spanish and the diphthong /aɪ/ in English. Spanish speakers may attempt to pronounce English *fine* as /finɛ/, *pine* as /pinɛ/, etc. Yet we know that the student is able to pronounce the diphthong /aɪ/ and a final nasal because he has them in Spanish. Spelling is obviously a factor in determining the kind of substitution that is made, but we note also that the problem is connected with a pattern of words and that the sounds of the pattern in Spanish are identified with the words and transferred to English.

2.11 *Perception of phonemic contrast through nonphonemic sound features.* It occurs sometimes that a phonemic contrast which does not exist as a contrast in the native language and which should be expected to constitute a major problem is actually not a problem in the perception of sounds. Perception of the contrast may take place through some accompanying feature which, although phonemic in the native language, in the foreign language is nonphonemic.

Problem: The contrast between English /i/ as in *beat* and /ɪ/ as in *bit* does not exist in German and would be expected to constitute a pronunciation problem both in speaking and in listening. Yet German speakers will identify the two sounds readily when those sounds are presented in minimal contrast. In most situations English /i/ is longer than /ɪ/, although this difference in length can be proved not to be a phonemic feature. The proof is very simple. One can speak the word *beat* quite short and the word *bit* quite long, and they will still remain two distinct words for English speakers. If length and not vowel quality were phonemic, the two words would have eventually been confused by native speakers. The quality of the two vowels is the deciding phonemic feature. The German speaker cannot hear clearly this difference in quality, but he hears a difference in length, because

vowel length is phonemic in German. Final proof is obtained by deliberately shortening the /i/ and lengthening the /ɪ/. The German speaker then has difficulty keeping them separate while the English speaker is not bothered at all.

Conclusion: The contrast between /i/ and /ɪ/ need not be considered a perception problem. It is a speaking problem, since the German speaker will produce a difference in length rather than a difference in quality, and the lack of a quality difference will confuse the English-speaking listener.

2.12 *Perception and production of a phonemic difference through different structural interpretation.* Linguists are in disagreement as to the phonemic interpretation of English /e/ as in *bait* and /o/ as in *boat*. Pike analyzes them as unit phonemes but phonetic diphthongs, and Bloomfield, Trager and others analyze them as phonemic diphthongs.[4] Spanish speakers hear a difference between English /e/ as in *bait* and /ɛ/ as in *bet*. They correlate English /e/ with the Spanish diphthong /ei/ as in *seis* 'six,' and English /ɛ/ with Spanish /e/ as in *sé* 'I know.' They do not perceive a quality difference between the initial element of English /e/ and /ɛ/. This can be shown by deliberately holding steady the initial quality of English /e/ throughout the vowel of *bait* and contrasting it minimally with /ɛ/ as in *bet*. The Spanish speaker will have trouble hearing the difference, while the English speaker will not be disturbed in his perception of the difference. The Spanish speaker will make the transfer of his diphthong and his single vowel /e/ to English when he speaks as well as when he listens. English speakers listening to him hear his diphthong as English /e/ and his single vowel as English /ɛ/.

Conclusion: Regardless of the analysis we may favor, the contrast between /e/ and /ɛ/ and that between /o/ and /ɔ/ in English does not constitute a significant problem for speakers of Spanish learning English.

2.13 *Dialect differences and pronunciation problems.* All languages spoken by large numbers of people show variations called dialects. "Dialect" is used here to mean a manner of speaking showing pronunciations, words, expressions, and grammatical constructions used more or less uniformly throughout an area or a group of speakers, which manner differs from those of other speakers of the same language. Sometimes a given dialect

[4]For a discussion of these two different interpretations see Morris Swadesh, "On the Analysis of English Syllabics," *Language*, 23 (1947): 137-50; and Kenneth L. Pike, "On the Phonemic Status of English Diphthongs," *Ibid.*, 151-59.

has greater prestige than other dialects. Dialects are distributed over different geographic areas, among different social classes, and at different times in the history of a language. English at present has several dialects that have prestige and are therefore considered standard. In the United States there are at least three major dialect areas: the North, the Midlands, and the South. In the eastern states the boundaries between these dialect areas have been carefully determined through field interviews. The boundary between the North and Midland areas runs in a westerly direction through northern Pennsylvania. That between the South and the Midlands runs southwest along the Blue Ridge Mountains in Virginia.[5] In England there is the dialect of the south of England, which resembles Received Standard in pronunciation, and there are more northerly dialects whose pronunciation resembles Midland American more closely than does Received Standard. There are also standard dialects of the Scots, Australians, New Zealanders, etc.

Spanish has several accepted standard dialects also. The usual dichotomy made between Castilian and American Spanish is a false oversimplification. Castilian is a definable standard dialect, but American Spanish shows several dialects that do not coincide with national boundaries. There are several acceptable dialects in Spain itself, some of them showing close resemblance to American dialects.

Chinese scholars seem to assign uniformly greater prestige to Mandarin Chinese than to other varieties. If their attitude reflects actual prestige resulting from acceptance as the standard dialect, the situation is different from that for English and Spanish at the present time.

When faced with these differences, what can we do in the analysis of pronunciation problems? The answer is to compare a specific dialect of the native language with a specific dialect of the foreign language. The student proceeds in that fashion. He goes from his own native dialect to the foreign dialect of his model. If the analysis is going to predict and describe the problems he will find, it will have to compare those two dialects. When we need to know the problems facing speakers of more than one dialect, separate solutions must be worked out for each problem. If the differences are minor, it may be possible to combine the presentation of the problems, but the statements must remain quite specific. The same holds true if the analysis is to apply to more than one dialect of the foreign language.

[5]For a study of dialects and dialect boundaries see Hans Kurath, *A Word Geography of the Eastern United States* (Ann Arbor: Univ. Mich. Press, 1949).

Problem: Castilian Spanish has a phonemic contrast between /θ/ as in *cien* 'one hundred' and /s/ as in *sien* 'temple.' The speaker of Castilian Spanish and of other varieties that have the same distinction will therefore have no trouble with English /θ/ as in *think* and /s/ as in *sink*.

Other dialects of Spanish do not have a phoneme /θ/. Words which in Castilian are pronounced with the phoneme /θ/ are pronounced with /s/ in those other dialects. The speakers of these dialects, then, will have major difficulty with English /θ/ contrasted with /s/.

2.14 *Unpredictable alternation between two potential substitutions.* It is interesting that although, for example, Japanese, Thai, Tagalog, and some dialects of Spanish lack a phoneme /θ/ that might approximate English /θ/ as in *think,* Japanese and Spanish speakers substitute /s/ while Thai and Tagalog speakers tend to substitute /t/ instead. Why is there a difference if in all four languages there is an /s/ phoneme and a /t/ phoneme?

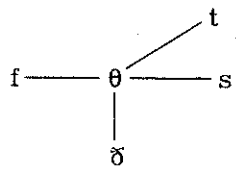
The answer, I believe, lies in the fact that the individual tends to transfer his whole sound system, and his whole sound system involves more than /s/, /t/, and the absence of /θ/. It will be helpful to try to explore some of the additional dimensions involved in this particular problem of /θ/, searching for a better understanding of what otherwise seems arbitrary, nonsystematic transfer of sounds.

English /θ/ as in *think* has as its form several phonemic features.[6] It is voiceless in contrast to /ð/ as in *then,* which is voiced. As to manner of articulation, it is a fricative in contrast to /t/ as in *ten,* which is a stop,[7] and in contrast to /s/ as in *sink,* which is a grooved sibilant.[8] As to point of articulation it is dental in contrast to /f/ as in *fin,* which is labio-dental. We can represent these contrasts, keeping the relative positions of the phonemes as they usually appear on phonemic charts, as follows:

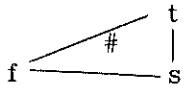
[6]A phonemic feature is one which somewhere in the language is used as the only distinctive feature of sound between two phonemes.

[7]The stop feature of /t/ in contrast to the fricative feature of /θ/ is dominant over the difference in point of articulation between these two phonemes. The /t/ articulated with the tongue tip between the teeth, but still as a stop, remains /t/. And when the point of articulation is alveolar but /t/ is pronounced as a fricative, it becomes /θ/.

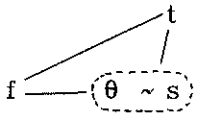
[8]Again, in the contrast between /θ/ and /s/, although there is a difference in the point of articulation as well as in the manner of articulation, the latter — fricative versus sibilant — constitutes the phonemic distinction. A fricative /s/ becomes /θ/, and a sibilant /θ/ becomes /s/, but a dental /s/ remains /s/, and an alveolar /θ/ remains /θ/.



It is easy to see why a Spanish speaker chooses /s/ instead of /t/ as a substitute for /θ/ when he does not have the phoneme /θ/ in his dialect of Spanish. The Spanish speaker has undoubtedly met other Spanish speakers who do have a phoneme /θ/ and who use it in many words in which he uses /s/. He has heard /θien/, /kaθa/, etc., for the words *cien, caza,* etc., which he pronounces as /sien/, /kasa/, etc. The field of /θ/ when he speaks might be represented as empty.

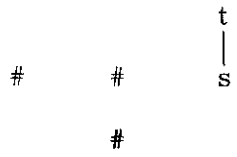


When he listens, it might be represented as follows:



In listening, the features of /θ/ operate for him as /s/. It thus seems quite reasonable that he should substitute /s/ for /θ/ in learning English. He does. He says, "I sink so" /aɪ sɪŋk so/ when attempting to say "I think so" /ai θɪŋk so/.

It is not as simple to see why a Japanese speaker tends to use /s/ also as his substitute for English /θ/. The potential field of /θ/ for him is something like the following:



The symbol # appears where English /f/, /θ/, and /ð/ would be located. We can readily see why he does not substitute /ð/ or /f/; he does not have those phonemes in Japanese. But why does he substitute /s/ instead of /t/, both of which are separated by one phonemic feature from /θ/ and would therefore seem to be phonemically equidistant from it?

It might be tempting to say that phonetically the difference between a sibilant, [s], and a fricative, [θ], is less than the difference between a stop, [t], and a fricative, [θ]. But immediately one faces the evidence from Thai and Tagalog speakers, who also have /t/ and /s/ available in their native language but substitute /t/ and not /s/ for /θ/. With this evidence against us, we are quite happy to return to the general premise that differences are relative to the phonemic structure of each language, and we abandon the explanation of the Japanese choice as based on general phonetic proximity of sibilants and fricatives.

If we cannot find a convincing explanation of the Japanese speaker's choice of /s/ instead of /t/ we can at least leave the way open by seeking phonemic proximity and distance within the phonemic structure of Japanese. If we could show that within the structure of Japanese the difference between a sibilant such as /s/ and a fricative such as /θ/ has less phonemic "force" than the difference between a stop and a fricative, we could then say that a Japanese speaker uses /s/ for /θ/ in English because *to him* they are more alike than /t/ and /θ/. This would be obviously true, but we find it difficult to show evidence why in his system /s/ and /θ/ are more alike.

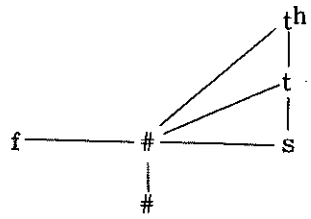
The evidence we find is not sufficiently strong to settle the matter completely. In Japanese we find one phonemic contrast in which a stop, /k/, contrasts minimally with /h/, which might conceivably be called a fricative and which in most of its variants is articulated in the region of /k/.[9] We do not find any minimal contrasts between a fricative and a sibilant.[10] There is then a slightly better chance that the Japanese speaker will hear a difference between English /t/ and /θ/ than between /s/ and /θ/ and that he will therefore tend to render English /θ/ as /s/ rather than as /t/.

We are introducing a quantitative criterion of difference based on the number of minimal phonemic contrasts attributable to a phonemic feature of difference.

The potential field of /θ/ for a Thai speaker does not seem to differ markedly from that of /θ/ for a Japanese speaker except for two other phonemes which show some similarity with it, namely Thai /f/ and /th/. We can visualize that field as follows:

[9]Before /u/ and before /t, k, č, š/ Japanese /h/ is usually a bilabial fricative. Before /u/ there is free variation between [h] and [f].

[10]The contrast between /s/ and /h/ involves the point of articulation as well as the manner of articulation.



Since there is no minimal contrast between a labio-dental point of articulation and an interdental one there would seem to be some possibility that the Thai speaker might perceive and pronounce English /θ/ as /f/, but he chooses /t/ instead. The fact that English /t/ has a variant with heavy aspiration should also tend to associate his Thai aspirated /th/ with English /t/, leaving his unaspirated Thai /t/ to associate with English /θ/. This is not a very convincing possibility, but it is sufficiently plausible to show that the association of /θ/ with /s/ is less likely for a Thai speaker than for a speaker of Japanese.

A Tagalog speaker tends to substitute his /t/ for English /θ/. Tagalog has no fricatives so that Tagalog speakers have the same lack of experience in distinguishing between a stop and a fricative, /t/ and /θ/, as between a sibilant and a fricative, /s/ and /θ/. The choice of /t/ must be on other terms. Spelling, the fact that English /θ/ is spelled with *th* is sometimes adduced as a possible factor. We leave the suggestion in the realm of possibility.

Although in the above situations we tried to illustrate cases which showed a maximum of difficulty in analysis, one thing may be of general value. When a phoneme in the foreign language does not exist in the native language the student will tend to substitute the native phoneme that seems nearest within the whole structure of his native language. In such cases, a difference is "greater" when used in the native language as the minimal difference in the largest number of contrasts between phonemes.

Another observation should be made at this time. In the kind of comparison we are presenting here there remain problems that cannot be completely stated without actual observation of the speech of informants as they attempt to learn the foreign language. Experienced teachers who have listened to their students' pronunciation carefully may be able to decide which choice will be made when the analysis remains ambiguous.

3. Problem Analysis: Stress and Rhythm.

3.1 *Introduction.* The analysis of problems of stress and

rhythm is of importance not only because stress is phonemic, that is, significant, in English and in other languages but also because stress and rhythm usually exert considerable pressure on other matters of pronunciation. Compare for example the word *have* under varying degrees of stress: With zero stress on *have,* the sentence, "You have done it," becomes /yuv dən ɪt/, where *have* does not constitute even a separate syllable but is reduced to /v/. With minimal stress on *have* the sentence becomes /yu əv dən ɪt/, where *have* is reduced to /əv/, a syllable that is weaker in stress than /yu/ and much weaker than /dən/. With intermediate stress on *have* the sentence becomes /yu həv dən ɪt/, where *have* is reduced to /həv/, a syllable of equal stress as /yu/. With maximum nonemotional stress on *have* the sentence may become /yu hæv dən ɪt/. Obviously we must consider stress and rhythm in any description of pronunciation problems.

Since we know that the learner tends to transfer his pronunciation system, including stress and rhythm patterns, to the foreign language we will look for stress and rhythm problems in the differences between the two languages. Let's describe briefly the stress and rhythm of English and Spanish. Once we have prepared these descriptions we will be better able to compare them in the work of locating and describing the problems that an English speaker finds in learning Spanish and those that a Spanish speaker finds when learning English. We must also touch on the pressure of stress patterns on segmental phonemes, and we will have to consider problems related to cognates and other types of words. The comparison of English and Spanish, although directly relevant only to those two languages, serves here to illustrate how two languages may be compared as to stress and rhythm.

3.2 *English stress and rhythm.* English has four significant degrees of stress, that is, four stress phonemes, or five if we consider zero stress as phonemic. Three of those degrees of stress are fixed as to position and are describable in terms of words or phrases; the fourth is movable and describable in terms of sentences and sequences of sentences. We will call the three word or phrase stresses *primary, secondary,* and *weak,* primary being the heaviest, secondary the intermediate one. We will call the movable stress *sentence stress.*

Let the word *substitution* serve as our example. When spoken rather slowly and somewhat deliberately, *substitution* often shows secondary stress on the first syllable, *sub-*, weak stress on the second syllable, *-sti-*, primary stress on the third, *-tu-*, and weak stress again on *-tion.* These three stresses are fixed as to

their position or potential position in that particular word and in words and phrases that fall into the same stress and rhythm pattern. Primary stress may sometimes be reduced in rapid speech, but if present it will normally be on the same syllable. The particular pattern represented by the word *substitution* as described is a rather frequent one in English; other examples, in phrases as well as words, abound: *constitution, with the people, must accept it,* etc.

Secondary stress, which has given rise to arguments as to whether or not it constitutes a phonemic entity, may be reduced to weak stress in rapid speech or it may be exaggerated to become primary stress in precise speech or in insistent, high-pressure style. Radio announcers often increase secondary stress to the level of primary stress and thus multiply the number of attention peaks in their delivery. However, a secondary stress cannot replace the normal primary stress in the same word or phrase except under the effect of sentence stress contrasting that syllable with some other one. For example, the word *constitution* is possible with two primary stresses, *cónstitútion,* but it is not normal with primary on the first syllable, *con-*, and secondary on the third, *-tu-*, except under contrastive sentence stress. An example of this exception would be the contrast, "I said CONstitution, not SUBstitution," capital letters indicating the sentence stress. Even here, however, it may occur that the syllables *-tu-* preserve their primary stress. In any case, it is important to note that secondary stress is relatively infrequent in English compared to primary and weak stresses. It is also important to note that many speakers seem not to use secondary stress at all but have a system of weak, primary, and sentence stresses instead.

Sentence stress. The sentence "What did you understand?" may occur with a sentence stress on any of its four words.

WHAT did you understand?
What DID you understand?
What did YOU understand?
What did you underSTAND?

Sentence stress is readily recognized in contrastive position:

I said NOW, not next YEAR.
I know what YOU said, but what did HE say?
Did you say THE letter or just A letter had come?

To say only that the position of sentence stress depends on the context does not actually describe the structure involved. In

short sentences the sentence stress usually coincides with the last primary stress:

I'm going to study in Ann ARbor.

In a series of sentences or phrases in which part of the material remains the same, the sentence stress falls on the parts that change:

JOHN is in school.
MARY is in school.
JANet is in school.
EVerybody's in school.

We had a vacation in Florida.
We SWAM in the sun.
We PLAYED in the sun.
We RAN in the sun.
We BASKED in the sun.
We had a wonderful time.

There may be more than one sentence stress in each sentence:

Getting MARried is one of the most important things that HAPpens to you.

Sentence stress is used to tie specific parts of sequence sentences and response sentences[11] with sentences that have been uttered previously. The following is one of several possible readings:

She went downstairs to the door and BECKoned to him.
"You have taken them aWAY?"
"YES, ma'am."
"Why did you DO it?"
"I saw you looking at them too LONG."
"What has THAT to do with it?"
"You have been HEART-broken all the morning, as if you did not want to LIVE."
"WELL?"
"And I could not BEAR to leave them in your way. There was MEANing in your LOOK at them."
"Where are they NOW?"

[11]Sequence sentences are "all the single free utterances or sentences, after the one at the beginning," in a stretch of continuous discourse on the part of one speaker. "Some of the utterance units *began* conversations.... All the other utterance units occurred after the conversation had started. They occurred as *responses* to preceding utterance units.. The utterance units of the second group, those that occurred after the conversation had started, I have called 'response utterance units.'" Charles C. Fries. *The Structure of English* (New York: Harcourt, Brace, and Co., 1952), pp. 241, 37.

"Locked UP."
"WHERE?"
"In the STAble."
"GIVE them to me."
"NO, ma'am."
"You reFUSE?"
"I DO. I care too MUCH for you to give 'em up."
(Thomas Hardy. *The Return of the Native.*)

Emphatic stress. A sixth degree of stress may be recognized (counting zero stress as one of the degrees) if we grant separate phonemic status to emphatic stress. This stress is characterized by much louder and much longer rendition of the syllable which carries it. The amount of loudness varies according to the degree of emotion involved and may reach the level of a shout. I am inclined to recognize this kind of stress not as a separate "emic" entity in the stress system but as a voice qualifier which is not restricted to the syllable receiving the stress.

Authors occasionally italicize words for special emphasis. This special emphasis may at times represent emotionally charged emphatic stress:

"Jane!" Mrs. Baxter cried, "you *mustn't* say such things!"
(Booth Tarkington. *Seventeen.*)
"My father *killed* somebody?"
(George Santayana. *The Last Puritan.*)
"If I could *help* you in any way..."
(Sinclair Lewis. *Main Street.*)
"*Why* should I love you?" "*Why* should I?"
(Elizabeth. *The Enchanted April.*)
"Now we shall be *completely* happy!"
(Elizabeth. *The Enchanted April.*)

But in other examples it seems to be sentence stress in a position where it would not normally fall:

"Why did they trouble *him* that way?"
(Harvey Allen. *Anthony Adverse.*)
"Marise, my darling, I want always to do what is best for *you* to do."
(Dorothy Canfield. *The Brimming Cup.*)
"...that – rich people had hearts, and that women *were* sisters."
(Katherine Mansfield. "A Cup of Tea.")

English rhythm. English stress rhythm is characterized by a primary stress in each phrase, and accompanying secondary and weak stresses, with a tendency to achieve approximately the same

length of time for each phrase regardless of the number of syllables involved.[12] Sentence stress is superimposed on this rhythm pattern and adds sentence rhythm as well.

The syllable receiving heaviest stress shows greater length than the others especially when a sentence stress coincides with it.[13] This emphasis and length of stressed syllables and the tendency to uniform length between stresses makes English rhythm "phrase timed" rather than "syllable timed."

The poetic practice of giving secondary stress to all weak syllables, which also tends to equalize their length, results in a special effect, the connotation of concentrated thought and feeling that characterizes much of English poetry. This difference in connotation is achievable precisely because the normal, matter-of-fact rhythm is so different.

3.3 *Spanish stress and rhythm.* Spanish has three significant levels of stress in nonoratorical, nondeclamatory style. Two of those levels are describable in terms of words and phrases; their positions are fixed for each word. The third stress is describable in terms of sentences; it is movable within the sentence to signal different points of attention. The word *constitución* shows a heavy stress on the last syllable and less pronounced stress on the other syllables. We will call the heavy stress *primary* and the less heavy one *secondary*. The movable stress describable in terms of sentences will be called *sentence stress*.

An acute accent mark will symbolize primary stress, the absence of any stress mark will indicate secondary stress, and a syllable written in capital letters will indicate sentence stress.

Although Spanish syllables receiving primary stress or sentence stress are longer than other syllables they are not as long as similar syllables in English. Spanish rhythm tends to give each syllable approximately the same duration of time. The phrases will thus be proportionately longer or shorter depending on the number of syllables they contain. Spanish, therefore, may be said to have syllable-timed rhythm. Actually, there are differences in the length and energy of syllables with secondary stress, but the differences are minor and seem to depend on distance from the primary stresses.

[12]This Procrustean characteristic of English rhythm may explain in part why syllable boundaries and the definition of the syllable have remained such a baffling problem for American linguists. Some linguists have even refused to recognize the syllable as a structural unit at all even though in some languages, at least, it may be an easily describable unit of distribution of phonemes and stress.

[13]For a somewhat different analysis of English stress see the widely known analysis by George Trager and Henry Lee Smith in their *Outline of English Structure* (Norman, Okla.: Battenburg Press, 1951).

All differences in stress are relative, not absolute; they are identifiable not in absolute physical units of measurement but in relative terms in comparison with other stresses in the same utterance.

For special effect a secondary stress may be increased to the level of a primary stress in any syllable except the one preceding a fixed primary stress: compare *cónstitución, constítución,* but not normally *constitúción*. To raise to primary stress the syllable preceding normal primary stress, it is necessary to impose a contrasting sentence stress on it. Primary stress then may be further described as not permitting a higher stress in another syllable in the same phrase.

Sentence stress in Spanish falls on the last primary stress with hardly any noticeable difference in resulting emphasis. *¿Cómo está usTED? ¿Cómo le VA? Buénos DIas. ¿Qué TAL?*

When sentence stress is placed on some other word for special or contrasting emphasis, the difference is more readily observable.

¿COmo está usted?
¿COmo le vá?
BUEnos días.
¿QUE tál?

Authors occasionally use italics to signal the special placing of such a sentence stress:

¿Es que podemos creer *demasiado* a Dios?
¿Podemos confiar *excesivamente* en el Padre?
¿Podemos en esta tierra amar *con exceso* a Cristo?
(Jesús Urteaga Loidi. *El valor divino de lo humano.*)

No podemos separarlos, porque Dios *no quiere* actuar solo, y el hombre . . . , no es que no quiera . . . , es que *no puede.*
(Jesús Urteaga Loidi. *El valor divino de lo humano.*)

3.4 *Comparison of English and Spanish stress.* Since Spanish does not have a weak stress and since we know from experience that the student transfers the system of his native language to the foreign language, we conclude that English speakers learning Spanish will tend to use weak stress in most syllables which require secondary stress in Spanish. They will also tend to lengthen beyond the pattern of Spanish the syllables receiving primary and sentence stress.

We see that there will be no difficulty in the production of secondary stress as such, but there will be phonemic substitution of weak stress for secondary stress in one direction, English to

Spanish, and secondary for weak in the other, Spanish to English. And there will be phonetic difficulties with primary and sentence stress in the lengthening of Spanish stressed syllables by English speakers and shortening of English stressed syllables by Spanish speakers.

Changes in segmental phonemes resulting from changes in stress. It is a regular feature of English to modify the pronunciation of utterances as the speed of talk or length of phrases increases, so that progressively more syllables are reduced to weaker stress. Compare for example the series of changes in the same sentence under different degrees of reduction.

He can understand them.
/hí kǽn əndərSTǽND ðém/
/hì kə̀n əndərSTǽN dəm/
/hìkn əndrSTǽNəm/
/hıknənrSTə́Nəm/

We see that /i/ is reduced to /ɪ/; /æ/ to /ə/ and eventually to zero in some places; /-nd/ + open transition to /-ndəm/ and eventually to /-nəm/.

When an English speaker learning Spanish changes secondary stress into a non-Spanish weak stress, he also introduces reductions of words which render them non-Spanish. For example, Spanish *beneméríta* /be-ne-mé-ri-ta/ may be pronounced as non-Spanish /bə̀n-ə-mér-ə-tə/.

Conversely, when the Spanish speaker learning English gives secondary stress to weak-stressed syllables, he substitutes for the weak-stressed vowels /ə,ɪ/ or the omitted vowels one of the five full vowels of Spanish.

Special problems resulting from sequences of stresses. In addition to differences in the number of stress phonemes and their phonetic characteristics, Spanish and English show differences in the sequences in which the stresses occur. In words of Latin origin in English the position of primary stress is often describable in terms of the suffixes and the number of a syllable when counted from the last one in the word: *constitution, substitution, addition, invention, suspicion, decision,* for example, are stressed on the next to the last syllable.

Other words in English tend to have primary stress on the first syllable if they have no prefix, and on the second if they begin with a prefix: *shovel, civil, water,* stressed on the first, and *debunk, detract, dehorn, deduct,* stressed on the second. The fact that the latter examples are all verbs does not detract from the point being made: that English has definite patterns in the placement

of primary stress and that some of those patterns are describable from the beginning of words and others from the end.[14]

Spanish also shows definite patterns in the placement of primary stress, but the location seems to be governed from the end of the word.

Problem: Spanish speakers learning English seem to discover this pull of English primary stress toward the beginning of words. They show this by overextending the pattern and pronouncing the word *museum* with stress on the first syllable. They may even find it difficult to pronounce the word with stress on the second syllable even though in Spanish they actually pronounce *museo* that way and would only have to transfer their Spanish pattern to place the primary stress where it normally falls in English.

Problem: Cognate words show patterns of correspondence in the placement of primary stress. These correspondences are a factor in the difficulty or ease of the pronunciation of those words. Spanish words ending in *-ción* have a primary stress on that last syllable. English cognates ending in *-tion, -cion* /šən/ are stressed on the syllable preceding that suffix. Spanish speakers learning English will first attempt to pronounce these words with stress on the last syllable and having failed to get the correct pronunciation will next attempt to pronounce them with stress at the beginning. Once a few words in this pattern are learned, however, they will manage others with great ease.

Spanish words ending in *-al* are stressed on the last syllable; English cognates ending in *-al* are stressed on the antepenult syllable: Spanish *capitál, animál, decimál* correspond to English *cápital, ánimal, décimal*. English speakers learning Spanish will attempt to stress these words on the first syllable, and when this is found to be incorrect, they may attempt to stress the second syllable. Once a few words are learned with primary stress on the end syllable, others will fall easily into pattern.

These patterns of correspondence in the words of the two languages constitute a distinct problem. The difficulty will usually be the difference in the location of the primary stress.

Problem: Spanish words ending in *-dad* are stressed on the last syllable. English cognates ending in *-ty* are stressed on the antepenult syllable: Spanish *habilidád* corresponds to English *abîlity*. Spanish speakers learn this pattern of correspondence early and they apply it even if they have never consciously

[14]This is an obvious oversimplification of the data available. We are merely illustrating this type of language patterning.

understood it. From Spanish *posibilidád* they may produce English *possibility*. They then apply the pattern to the cognate *difficulty* which does not follow the same pattern of stress and they invent the form *difficulty*.

4. Problem Analysis: Intonation.

4.1 *Location and description of intonation problems.*

Intonation versus tone. Pitch, the voice quality we describe as high or low on a musical scale, is used in two distinct ways in language: (1) as part of the sentence and phrase, and (2) as part of the word. English uses voice pitch as part of the sentence and phrase but not as part of the word. Chinese, on the other hand, uses voice pitch as part of the word. The pitch, or tone, is as much a part of a Chinese word as are the sound segments; changing the tone can change one word into another word. The pitch of a word in English, as we said, is not part of the word; the pitch in English changes to meet the needs of the phrase and sentence and the word remains the same. When pitch is used with phrases and sentences, we call it intonation. When pitch is used to identify and differentiate words, we call it tone. Chinese is a tone language. English is not a tone language; it is an intonation language.

The problems of learning the pitch system of a foreign language will vary depending on whether both the native and foreign languages are intonation languages or one is a tone language. To illustrate the various types of problems that arise we will discuss examples involving intonation alone, and intonation and tone. In any case, many of the suggestions given above for the comparison of sound segments can be adapted to pitch analysis as well. Since English will be one of the languages compared in the illustrations, it is helpful to begin with a sketch of English intonation.

4.2 *English intonation.*

Four pitch phonemes. We know that English has four pitch phonemes, not four fixed points on a musical scale but four relative levels.[15] The intervals between them change in amplitude

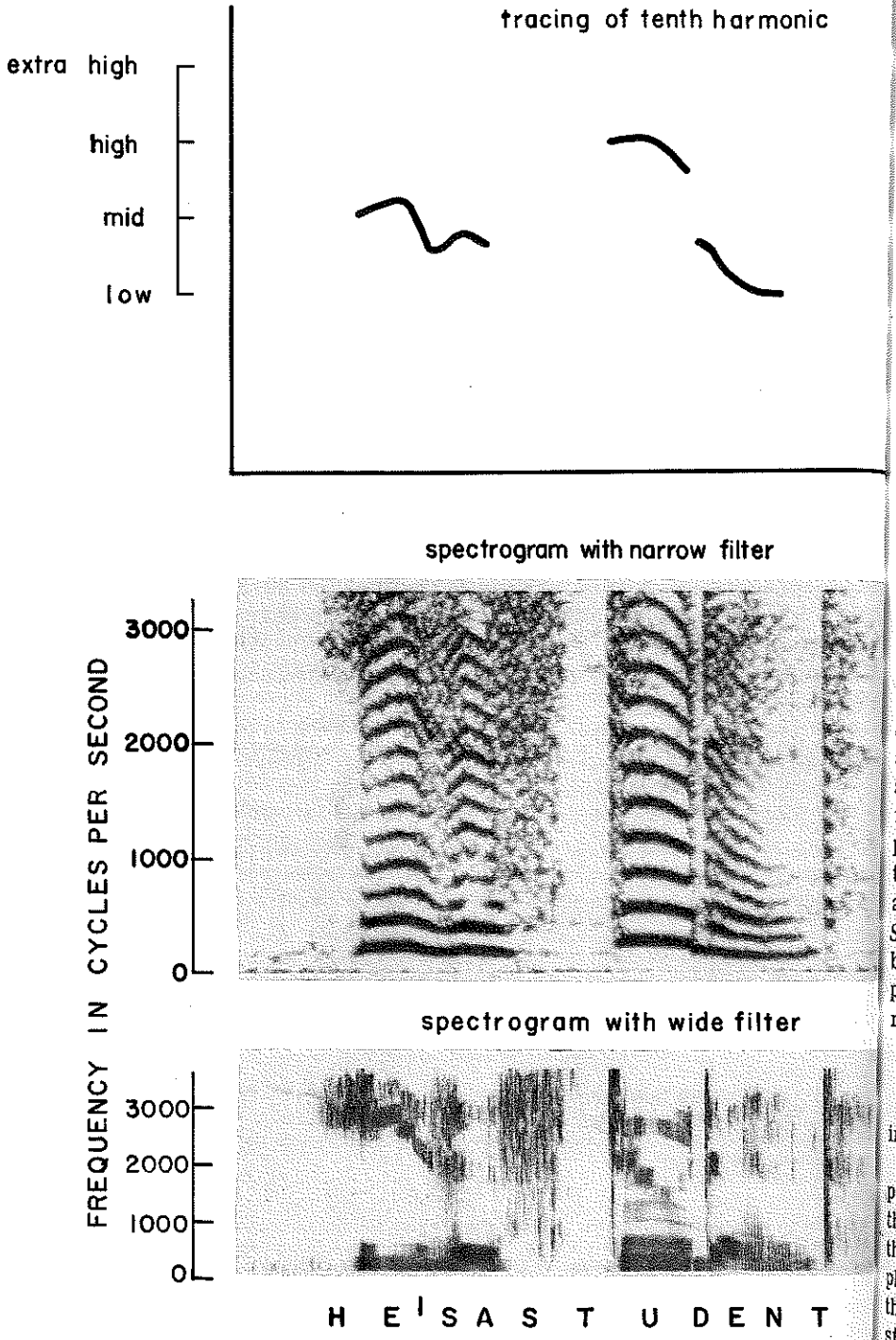
[15]Kenneth L. Pike postulated these four phonemes of pitch and describes them in his book, *The Intonation of American English* (Ann Arbor: Univ. Mich. Press, 1945), the most complete treatment of English intonation. Pike uses numbers to represent the four pitches, number 1 to represent the highest pitch and number 4 to represent the lowest. He also uses lines, solid, dotted, or a combination, above and below the line of print to represent the pitches. In the pronunciation materials of the English Language Institute the solid lines were used for pedagogical reasons. For a full treatment of these pitch phonemes see Pike's Chapter 3, "General Characteristics of Intonation," pp. 20-43. For a simple discussion of the findings see Charles C. Fries, *Teaching and Learning English as a Foreign Language* (Ann Arbor: Univ. Mich. Press, 1945) pp. 20-23. George L. Trager and Henry Lee Smith, Jr., confirm the four-pitch system of English in *An Outline of English Structure* (Norman, Okla.: Battenburg Press, 1951) but number them 4 for the highest and 1 for the lowest.

from speaker to speaker and from situation to situation even for the same speaker. In the sentence, "He's a student," spoken with a normal *mid pitch* at the beginning, a *high pitch* on *stu-* and dropping to a *low pitch* at the end, we hear three of those four pitches in operation. A woman would normally render the same sentence at a higher general pitch than a man. And both would raise the level of the pitches and widen the height of the intervals under various circumstances, for example when attempting to communicate with someone across the street. They would lower the pitches and keep them close together when speaking to someone next to them in a dentist's waiting room.

The level of the pitches is not steady but wavers considerably within an utterance, or to put it another way, there are variations within each pitch level as the sentence progresses. These variations within each pitch level seem to correlate in part with variations in stress and with particular sound segments, but have no primary significance in communication. A sound spectrogram of our sample sentence, "He's a student," with intonation as described above, was made in such a way that the harmonics of the voice are clearly shown. Tracing the tenth harmonic from the sound spectrogram produced the line shown on the chart.[16] Professor Gordon Peterson gave the following information concerning the chart:

> For the voiceless consonants the vocal cords normally do not vibrate and thus these consonants have no fundamental voice frequency. Also, it is often difficult to identify the overtone structure in voiced consonants with strong friction. These considerations largely account for the breaks in charts of the fundamental voice frequency by the sound spectrograph.
>
> In complex waves such as those for the vowels and voiced consonants of speech, the overtones are integral multiples of the fundamental. Thus the fundamental voice frequency can be plotted by tracing one of the harmonics and dividing the frequency scale by the corresponding harmonic number. It has been demonstrated that the perception of the pitch of a complex wave is influenced by its overtone structure. Since there is greater emphasis in the energy of the higher formants of front vowels, the pitch of a high front vowel might seem higher than that of a high back vowel at the same fundamental voice frequency. It follows that there is not an exact correspondence between fundamental voice frequency and perceived tone and intonation, but the correspondence is usually sufficient to be of aid in determining linguistic structure.

[16]Professor Gordon Peterson kindly provided the sound spectrogram and the tracing of the tenth harmonic to show intonation level. In many spectrograms which we made of a sentence in the various intonation patterns used in this section, it became abundantly clear that the pitch of the voice does not jump from one "level" to another, but glides more or less sharply toward points which are heard by native speakers as minimal differences. Much remains to be done in the instrumental study of intonation within a structural frame. *See* "Phonetics, Phonemics and Pronunciation: Spectrographic Analysis," by Gordon Peterson, Monogr. No. 6 (1954), *Georgetown Univ. Monogr. Series on Languages and Linguistics*, pp. 7-18.



In spite of these variations in the relative level of these pitches, the startling fact remains that they operate as the only four significant pitch units, or phonemes, in English. Representing these levels with the letters *l* for low, *m* for mid, *h* for high, and *x* for extra high, we can illustrate the four pitches in contrast at the end of the same example:

He's a STUdent. (A normal, matter-of-fact report.)
m h l

He's a STUdent. (Indicating that the utterance is not finished or that the fact that he is a student is like an afterthought, having significance for something said previously.)
m h m

He's a STUdent. (Indicating mild doubt as to his being a student or as if trying to remember if he is a student.)
m h h

He's a STUdent. (Indicating strong disbelief or surprise.)
m h x

Intonation phrases. We have shown the four pitch phonemes of English in intonation phrases rather than in isolation because they normally occur and operate in phrases. The situation is somewhat similar to that of segmental phonemes such as vowels and consonants, which also operate in sequences such as words and morphemes, and not in isolation. Not all the pitch evidence is relevant to the identification and operation of intonation phrases. Two points are usually sufficient to identify the phrase: the pitch phoneme at the onset of the phrase or sentence stress, and the final pitch. Those are the pitches marked on the word *STUdent* in the examples above. When there is a fall and a rise between those two points, a third pitch is required to identify the phrase, namely the pitch at the point where the fall changes to a rise. It is possible to write then

STUdent
h l m

indicating a glide from high to low and then a rise to mid.

In addition, when there are syllables before the onset of phrase stress, the intonation phrase has an introductory pitch there also, as in our examples above, which had a mid pitch at the beginning. This introductory pitch is not essential to the phrase, because its occurrence is mechanically determined by the existence of syllables preceding the phrase or sentence stress. Notice the following examples in which the intonation

phrase is a high—low, meaning matter-of-fact report with attention on *student*.

What is his occupation?	STUdent. h- -l
What is he?	A STUdent. m h- -l
What did you say he was?	Hè's a STUdent. m h- -l

If the onset of stress occurs on *he* instead of on *stu-*, the center of attention is shifted to *he*, but the intonation phrase continues to be high—low, meaning in this case again 'matter-of-fact' report. Compare

Hè's a STUdent.
m h- -l

HE'S a stùdent.
h- -l

The hyphens tie together the central, essential part of the intonation phrase as above: m h- -l, h- -l.

Some intonation phrases of English. The intonation phrases of American English are numerous. Below are some of the more common ones.[17]

Phrases falling to low. High—low, mid—low, extra high—low. The general meaning of falling phrases is one of contrastive pointing. Examples,

High—low:	He's a STUdent. m h- -l	(Matter-of-fact attitude. Attention on student.)
Mid—low:	He's a STUdent. m m- -l	(Detached attitude.)
Extra high—low:	He's a STUdent. m x- -l	(Intensely contrastive, surprise.)

Phrases falling to mid. High—mid, extra high—mid. The general meaning is contrastive pointing as for other falling phrases. Those ending on mid, however, rarely if ever occur before a final pause and as a result they also imply nonfinality. Examples:

[17] A much fuller treatment of these and other intonation phrases is given in Pike, *The Intonation*, Chap. 4, "Specific Contours," pp. 44-106.

High—mid:	He's a STUdent. m h- -m	(Showing mild doubt and or nonfinality.)
Extra high—mid:	He's a STUdent. m x- -m	(Showing intense surprise or doubt, and incompleteness as in a question.)

Phrases rising from low. Low—mid, low—high, low—extra high. All rising phrases tend to indicate incompleteness, the incompleteness of a conversation, of a series, or of a question that requires an answer.

He's a STUdent. m l- -m	(Deliberative. Detached incompleteness.)
He's a STUdent. m l- -h	(Matter-of-fact incompleteness. Thoughtful doubt.)
He's a STUdent. m l- -x	(Surprise; strong doubt. Deliberation.)

Phrases rising from mid. Mid—high, mid—extra high..

He's a STUdent. m m- -h	(Matter-of-fact inquiry.)
He's a STUdent. m m- -x	(Surprise and disbelief.)

The meanings of these latter intonation contours are elusive and difficult to define, but they do contrast. The meanings given may be restricted to the particular pattern of utterance used as illustration, as for example in the mid—high, given as matter-of-fact inquiry. The same intonation phrase coming in the middle of a sentence might signal a series.

Although a rising intonation, especially a mid—high, is often used with questions, a falling intonation such as a high—low is also used with questions of all types. The intonation meaning will, of course, be different, but the questions will remain questions. Compare a mid—high and a high—low on the question "What?" in the following contexts:

"I did it again."

"What?"
m- -h

"I did it again."

With the rising intonation, the meaning is something like 'What

did you say? I did not hear you.' With a falling intonation the meaning is quite different:

"I did it again."

"What?"
h- -l

"I forgot my dental appointment."

The meaning is now 'What did you do? Please explain.' Both the falling and the rising intonations can be used on questions which can be answered with "yes" or "no". Compare for example,

"Are you a STUdent?" (Polite. The first question of a conversation.)
m m- -h

"Are you a STUdent?" (Business like, matter-of-fact. One in a series of questions but perhaps not the first one.)
m h- -l

4.3 *Comparing two intonation languages.* The simplest case in a comparison would seem to be that of two intonation languages, for example, English and Spanish, or English and French. In such cases there will be two stages in the comparison: (1) comparison of pitch phonemes, and (2) comparison of the intonation patterns.

Stage 1: Comparison of pitch phonemes. We have seen that English has four distinct pitch phonemes, which we called low, mid, high, and extra high. These pitch phonemes have no lexical meaning in themselves, but any one of them can change an intonation phrase into another, just as any one of the segmental phonemes of English can change one word into another word. If English is the foreign language, we will inquire how many pitch phonemes the native language has. It may have four, three, two, five, or perhaps even some other number.

Same number of pitch phonemes. If the native language has four pitch phonemes, and if they are similar to the English pitch phonemes in level, we can assume that the speakers will have no particular difficulty hearing and producing the pitch phonemes of English. According to my information, that is the case of English and Spanish, in which both languages have four pitch phonemes that can be labeled as low, mid, high, and extra high.[18]

[18] My interpretation of Spanish intonation as a four-pitch phoneme system is based on the data presented by Tomás Navarro Tomás in *Manual de entonación española*, (2d ed., rev.; New York: Hispanic Institute in the United States, 1948). J. Donald Bowen in "A Comparison of the Intonation Patterns of English and Spanish" (*Hispania*, 39, No. 1, March, 1956, 30-35) limits the system to three pitch phonemes: low, mid, and high. Bowen recognizes a high pitch phoneme in matter-of-fact questions and in emphatic statements. If that is the case, we need to recognize an extra high pitch phoneme in emphatic questions.

The fact that two languages have the same number of phonemes and that they are similar enough to function as "same" in the two languages does not indicate that there will not be problems in learning their intonation. As we will see later, there are major problems in learning the intonation patterns that are different in form or different in meaning. That kind of problem will be discussed in stage 2, when we compare intonation patterns.

Different number of pitch phonemes. Problems will arise when the native language has fewer pitch phonemes than the foreign language. If the native language has three pitch phonemes and the foreign language has four, we can predict a learning problem. Two possibilities are worth mentioning in such a case: first, the three pitch phonemes of the native language coincide with the lowest three pitch phonemes of the foreign language. Since there is no counterpart for the extra high level of the foreign language, the problem will be to learn to hear and to use the extra high pitch phoneme as distinct from the high one and to distinguish the extra high from emotional variations.

In the second possibility the total range of the three pitch phonemes of the native language is the same as the total range of the four foreign ones, that is, the high and the low phonemes of the native language range as high and as low as the extra high and the low of the foreign language. The problem then will be learning to hear and to produce two pitch phonemes in the middle range where the native language has only one. An additional problem may turn out to be the distinction between high and extra high and between mid and low.

When the student goes from a native language having more pitch phonemes than the foreign language, there will be no major intonation problem, because he will be able to hear the fewer distinctions of the foreign language. Once the simpler system has been understood by him, he will be able to use it without much effort. He will tend, however, to have erroneous secondary reactions such as, for example, feeling that the people who speak that language are cold and detached, not very expressive, or feeling the opposite, that they are overly emotional and excitable, and the like.

Stage 2: Comparison of intonation patterns. Even when the pitch phonemes of the two languages are the same in number and similar in pitch, problems will undoubtedly arise in learning the intonation patterns. These problems are caused by intonation patterns in the foreign language that do not exist in the native language or by patterns that are similar in form in the two languages but have different meanings.

When an intonation pattern in the foreign language is not found in the native language we can assume that the student will have trouble producing and hearing it. He will hear it as some other pattern which does exist in the native language. It may sometimes appear on the surface that he does not hear one of the pitch phonemes, and in effect he may actually have trouble with only one pitch phoneme in the pattern, but a more accurate diagnosis is one that correctly restricts the problem to that particular pattern since he will not have trouble with the same pitch phoneme in other patterns.

Most of the intonation problems will stem from patterns which are the same in form in the two languages but have a different meaning in each. The student automatically selects the pattern of his native language for the meaning he is going to express. He also interprets the foreign language problem with the native language meaning.

Problem: Spanish uses a rising mid-high intonation pattern on the confirmatory attached question *¿verdad?* For example, *Es interesante ¿verdad?* meaning, 'It's interesting, isn't it?' which in English has a falling high-low intonation on *isn't it.* Lexically, Spanish *¿verdad?* with its rising intonation, and English *isn't it* with its falling intonation are quite similar.

Spanish speakers learning English will transfer their rising intonation pattern into English in the above example as elsewhere. The tendency is so strong that a student may fail to produce the falling pattern even after the sentence is repeated for him and his attention is called to it. As an informal experiment a student who used a rising intonation in such an attached question was asked to imitate a teacher who kept repeating it with a falling intonation as the model. The student attempted to imitate the falling intonation pattern twelve consecutive times and failed. The experiment can easily be repeated with results that vary but still reveal a problem.

Problem: Spanish matter-of-fact statements are normally said with a low-mid-low intonation pattern. The mid pitch begins at the first stressed syllable and changes to low at the onset of the last stressed syllable. English matter-of-fact statements, on the other hand, are normally said with a mid-high-low intonation pattern, with the high occurring at the last stressed syllable. As a result, Spanish speakers will tend to give English statements with the low-mid-low pattern of Spanish, producing an unintentional effect of detachment. Going in the opposite direction, English speakers learning Spanish tend to rise to high on the last stressed syllable as they would in matter-of-fact English. The result in Spanish, however, is either a question or an emphatic statement, neither of which are intended by the speaker.

4.4 *Comparing a tone language and an intonation language.* English and Spanish, even though their systems are different, are both intonation languages. But when one of the languages is a tone language, for example when one of the languages is Chinese or Thai, the comparison becomes more complex and the problems of the student learning the other language are probably greater. The experience of Thai and Chinese students learning English testifies to the difficulty of English intonation problems for those speakers. The experience of English speakers learning Chinese also attests the great difficulty that learning Chinese tone represents for them in turn. Some never learn it even when they live in China many years.

In making a comparison of the systems of a tone and an intonation language we will have to consider not only differences in pitch but entirely different systems of distribution of pitch. In English, as we saw above, pitch is distributed over phrases and sentences. In Chinese and in Thai it is distributed over morphemes and words. A high—mid sequence in the middle of a sentence in English does not attach to a particular word as such, but to the position in which that word occurs. Similarly, a high—low sequence at the end of a sentence does not belong to the word at the end of that sentence but to that position itself. The very same words will have different pitch elsewhere. In Thai, however, the high tone of a given word belongs to that particular word, that is, the tone serves to identify the particular word, to distinguish it from other words. Consequently, a Thai speaker learning English expects pitch to attach to morphemes and words, and he is lost because English to him keeps changing the tones hopelessly as far as the individual word is concerned. Similarly, an English speaker learning Chinese does not perceive tone as part of morphemes and words, and of course he cannot produce it as such. He is thoroughly confused by the seemingly unpredictable changes in the "intonation" of the sentences.

The comparison of a tone language with an intonation language will involve the same two stages as when both languages were of the intonation type. The first stage is the comparison of the minimum significant pitch units, the pitch phonemes. The second stage will be the comparison of patterns of pitch-phoneme sequences. In comparing the pitch phonemes we must discuss separately those tone languages in which the pitch phonemes are level and those in which the pitch phonemes are not level but

gliding. Those with level phonemes of pitch are called register tone systems, and those with gliding phonemes are called contour tone systems.

Comparisons involving register tones only. Several cases may arise involving register tones and intonation. The comparison at this first stage will parallel that between two intonation languages. We can take up two cases separately as illustrations.

Case A. One language has two tones, and the number of pitch phonemes of the other language is four: low, mid, high, and extra high. There will be a serious problem when the speaker of the tone language tries to learn the intonation of the other. Both high and extra high pitch phonemes will be heard as "same" by him. Mid and low will also be heard as same. There will probably not be trouble in hearing the difference between mid and high. The difficulty will also include speaking. The student may not be able to produce the extra high and the low pitch phonemes if the range of his two native tones is narrow. Or he may sometimes interchange high and extra high, and low and mid if the pitch range of the two native tones is wide.

A student going from a four-pitch phoneme system to a two-tone system will not have any major difficulty learning the tones, and may only have to overcome the tendency to jump at secondary interpretations about expressiveness, emotionalism, or the lack of it, which more than likely have no basis in fact.

Case B. If one of the languages has three significant tones and the other has four pitch phonemes, we can make the same analysis as when comparing two intonation languages, one of which has three pitch phonemes and the other, four.

Comparisons involving contour (gliding) tones and level pitch phonemes of intonation. When the language has gliding tones rather than level ones, the analysis may be more difficult but we can still chart some expected things to clarify the problem. By way of illustration we can assume a tone language with two gliding tones — a rise and a fall — and an intonation language with four pitch phonemes — low, mid, high, and extra high. Going from the language with the two gliding tones to the four-pitch phoneme language, the student will hear the level pitch phoneme system as if it were a system of glides. He will hear clearly the difference between a rise and a fall but he will not hear the difference between the lower pitch phonemes or the higher ones. Thus he will not hear the difference between a rise from low to mid and from mid to high or between a fall from high to mid and one from mid to low. The problem is then to learn to hear and to produce the level pitch phonemes as significant units of patterns, which at first he hears only as undifferentiated rises and falls.

The second stage involves comparison of tone and intonation patterns. The most important problem here is the difference in distribution between tone and intonation. In the tone language, as we have seen, the pitch belongs primarily to the word, whereas in the intonation language, it does not belong to the word but to the phrase and sentence. In listening, the speaker of a tone language learning English, for example, will attribute the pitch variations to the words and will end in complete confusion as to the tone he hears. In one utterance he will hear the word *leaves*, for example, with a falling high—low pitch; in another he hears it with a level mid pitch; he will hear it with a rising mid—high intonation and with level low or level high, etc. He will hopelessly try to remember the pitch pattern of *leaves* but will fail because *leaves* as a word has no pitch pattern in English. Going in the opposite direction, that is from intonation into tone, an English speaker learning the tone language is equally baffled because he will be listening for intonation patterns on the phrases and sentences.

Complicating the data is the fact that tone languages usually have an intonation system over and above the tone system of its words. The intonation system of tone languages tends to be a simple one limited to two additional pitch phonemes occurring at phrase and sentence final points. When the additional pitch phonemes resemble those of the foreign language, they will be transferred without difficulty and will simplify the learning burden. For the English speaker learning the tone language they further complicate the learning problem by (1) misleading him to assume that he is learning the pitch patterns of the language, and (2) making the description of word tone more complex, since tone is modified at phrase and intonation ends.

The discussion on comparison of intonation and tone systems has included few examples because intonation has only recently been described in structural terms. There is a scarcity of structural data on the intonation of specific languages. As structural descriptions of the intonation of other languages appear, it may be possible to find concrete examples illustrating the above and other important problems.

4.5 *Problems of juncture and word boundaries*. In learning a foreign language one of the problems is the identification of the constituents of utterances. One of the important constituents of utterances is the word. Words have to be identified as words for their lexical meaning, and words have to be identified as members of form classes for the grammatical functions they perform and the grammatical meanings they convey in the utterance.

The identification of words is a matter of pronunciation as well as of vocabulary and grammar. A Brazilian journalist studying English complained after a test of aural comprehension that his difficulty was not in pronunciation but in the vocabulary of the test. He felt he did not know enough words. Arguments to the contrary failed to convince him that pronunciation had been at least part of the difficulty. He was ready to abandon pronunciation to devote more time to vocabulary. As a last resort I showed him the test that had troubled him and let him read the items he had missed when listening to them. Through reading he was able to give the expected answers to many of those same items. Obviously, having to grasp the units of the language through the medium of sound had been his difficulty. This same experience can be reproduced over and over again with unfailing regularity.

We identify words through sound segments, stress, and tone in tone languages, and also through word boundaries. The importance of these boundaries may be more easily admitted if we note a difference between the way words are joined in speech and the spaces left between words in present-day writing in many languages. Identifying word units in reading has been made easier by that practice. Notice that it is more difficult to read the following sentences because the words are run together. "Wedonot realizethatinspeakingwemaynothaveasclearlydefinedwordjuncture asthespacesbetweenwordsinwritingwouldhaveusbelieve. Spaces betweenwordsarehelpfulinidentifyingwordsinwrittenmaterial."

In the spoken language, word boundaries are sometimes identified by the presence of permitted sequences of phonemes at the beginning and at the end of words. In Spanish, /sp/, /st/, /sk/ are not permitted at the beginning or end of words; a vowel has to precede them initially or follow them finally. Examples of their use initially after a vowel or finally before a vowel are numerous: *escuela, aspecto, estudiante, escudo, obispo, esto, casco,* etc. A person who has studied Spanish and hears /vanestandobien/ is ready to separate words as /van estando . . . /, /vanes tan . . . / or /van es tan . . . /, but not as /vane stand . . . /, because /st/ is not permitted initially without the vowel. In English, however, /st/ does occur initially in many words: *student, school, Spanish,* etc. and so an English speaker listening to that Spanish utterance will have the interference of potential units such as /stand/, which is common in his native sound system but not permitted in Spanish.

Word boundaries are also marked in part by the transition – juncture – between sounds at such boundaries. The transition between the /t/ and the /r/ in *eat rye* is different from the transition between the same two sounds in *we try*. If we represent the more open transition by a space we would have something like /ìt ráɪ/ vs. /wì tráɪ/. The same kind of difference is observed in slow pronunciation of the well known example, *night rate* vs. *nitrate:* /náɪt rèt/ vs. /náɪtrèt/. Linguists are not completely in agreement in the analysis of these transition phenomena. In these particular examples the different phonetic articulation of the /r/ is quite obvious: in /náɪtrèt/ it is a fricative sound, almost a sibilant; in /náɪt rèt/ it is a retroflex. In other cases of difference in transition it may not be as simple a matter. In any case, however, we must agree that transition phenomena are important in identifying words.

Word boundaries are often leveled or shifted in rapid speech when they are fitted into syllable units that do not coincide with the word boundaries. The utterance, *Attend it,* for example, may be pronounced /ətɛ́nd ɪt/ with a word boundary between *attend* and *it* as expected, or it may be pronounced /ətɛ́n dɪt/ with the word boundary, if any, forced over to the syllable transition between /n/ and /d/.

When word boundaries are marked by the same sequences of segments and the same transitions in the foreign language as in the native language, we do not expect any major learning problem. If the boundaries are differently marked we can expect difficulty and will attempt to describe the differences in the analysis of difficulties.

The problem may be particularly acute for speakers of languages like Chinese, which have mostly single syllable words with strongly marked boundaries, when they learn a language with a variety of word lengths and with shifting transition boundaries. When such speakers learn English, for example, they have considerable difficulty in identifying the word units in actual utterances, because of the variety in the length and structure of English words and the less obvious word boundaries, and because of the changes they undergo with different styles of pronunciation. In reading, on the other hand, the difficulty is obviated by the standard practice of leaving spaces between words.

This problem of boundaries is observable not only among foreign speakers of a language but in child language as well. My three-year-old daughter used two word formations in Spanish which are of interest here. She said **suvítas* with an initial /s/ for the word *uvitas* 'little grapes' or simply 'grapes' in child language. And she said **savelítas* with an added initial /sa/ for the word *velitas* 'little candles' or simply 'candles.' She said, *¿Dónde hay *suvítas? Yo quiero *suvítas,* meaning 'Where are there grapes? I want grapes,' and she said, *¿Dónde hay *savelitas?*

*Yo quiero *savelitas,* meaning 'Where are there candles? I want candles.' She had heard *uvitas* and *velitas* in utterances such as *¿Quiéres uvitas? ¿Quiéres más uvitas? ¿Quiéres las uvitas? ¿Quiéres tus uvitas?* etc. with /s/ preceding *uvitas.* In Spanish the most frequent syllable pattern is that of a consonant plus a vowel. Compare the consonant plus vowel beginning of other words she heard: *peritas, manzanitas, sopita, comidita, zapatitos,* etc. She identified the word for grapes as **suvitas* probably because, having heard the /s/ preceding *uvitas* in close transition with it, she placed the word boundary before the consonant, following a dominant Spanish pattern.

The case of **savelitas* seems equally interesting. She heard *tus velitas, las velitas,* with /s/ before the *v* of *velitas* in rapid transition, but *sv* does not occur initially in Spanish words, so she normalized it into a Spanish pattern by adding a vowel between the *s* and the *v,* giving **savelitas* on the pattern of **suvitas, sopita,* etc.

Pauses. Languages usually end their utterances, sentences, and sometimes their phrases with distinctive features of sound, length, and silence, and these features vary from language to language. English has a final pause characterized by a fading out, a lower or dropping pitch, and silence. It has been symbolized in many ways. We will use a period /./ to represent it, with the understanding that this is a special use of the period, independent of any other conventional use of that symbol. English also has a tentative pause characterized by a sustention of the end pitch and at times a lengthening of the last syllable preceding the tentative pause. It will be represented as a comma /,/, again with the proviso that this is a special use of that symbol. Still a third type of pause is presented by some linguists; a slight rise before silence. It may be symbolized as /?/, also with the understanding that this is a technical use of the question mark independent of any meanings it may have acquired through conventional use of the question mark in ordinary writing.

Utterances, sentences, and sometimes phrases are also begun with special features of sound articulation, length, or reduction of length of initial sounds, in the breaking of silence. Thus far no contrastive initial pauses have been reported by linguists for English, and we will not use any symbol for the initial features of utterance.

When differences exist between two languages in the form, the meaning or the distribution of these pauses and transitions, there may be problems involved in learning the other language. Some varieties of Mexican Spanish tend to unvoice the final syllable before a final pause. Transfer of that pattern to English produces major changes in the intonation patterns of English.

Chapter 3

HOW TO COMPARE TWO GRAMMATICAL STRUCTURES

1. Introduction: What Does Grammatical Structure Mean?

1.1 Because of early overemphasis on memorization of grammatical rules as an end-all of language learning, and the reaction against that extreme which has resulted in an equally disastrous negation of all grammatical study nowadays, it is necessary and helpful to clarify what is meant by grammatical structure and what is not meant by it.

1.2 *Not grammar as definitions or as grammatical terms in the older sense.* Some might think that by grammatical structure we mean grammar, and in a sense that is true, but there are a number of things that grammar often implies that we do not mean by grammatical structure, certainly not from the point of view of language learning problems. Grammar sometimes means giving traditional definitions to elements of speech, definitions that do not account for the facts of language.[1] The type of problem that results from that kind of grammar requires the student to define a noun, a subject, a direct object, or it requires him to write N above the nouns, V above the verbs, D O above the direct objects in given sentences. Since many native speakers of a language are unable to define or even identify by technical terms the grammatical elements of their native language, we cannot accept that kind of problem as representing the task of learning a foreign language.

1.3 *Not absolute rules of correctness.* Another aspect that grammar sometimes has and grammatical structure does not is that of artificial "correctness," found in many handbooks. This correctness point of view assumes that grammar is a set of absolute rules to which the language must adjust. The attitude is that these rules were laid down by some authority who based them on reasons which we need not understand and which we cannot question. When a speaker or writer uses language that is not in accord with these fixed rules, the correctness point of view assumes that he is guilty of bad grammar regardless of accepted

[1]Charles C. Fries, *The Structure of English* (New York: Harcourt, Brace, and Co., 1952), *passim.*