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PÓS-GRADUAÇÃO EM LETRAS/INGLÊS E LITERATURA CORRESPONDENTE

The influence of a native English speaking environment on the pronunciation of EFL

Brazilian speakers − a study of the suprasegmentals

por

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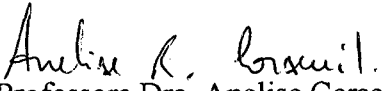
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PREFACE AND ACKNOWLEDGEMENTS

I do not intend to tell the full story behind this work. I would only like to say that I was moved by an enormous wish to accomplish this task so as to leave, hopefully, for the future generations, an example of the application of a simple but very useful method for the analysis of intonation. At the same time, it is my wish to deliver this study as a token to the establishment of pronunciation, with emphasis on intonation and its accompanying suprasegmentals, as a legitimate space-occupying topic in the curriculum of the teaching of foreign languages.

I had the fortune and the privilege to enjoy the teachings and the friendship of a number of linguists in the long years of my career. It is with gratitude and emotion that I recall the names of Moacir Akui, Clifford H. Prator, Jr., Neusa M. Carson, Giles L. Istre, Albino de Bem Veiga, Celso Cunha, Leda Bisol, Malcolm Coulthard, David Brazil, Rosa W. Konder, Martin Hewings, Charles Owen, Murray Knowles and David Crystal.

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Iria Werlang Garcia

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ABSTRACT

The influence of a native English-speaking environment on the pronunciation of

EFL Brazilian speakers – a study of the suprasegmentals

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Non-native speakers of a particular language may master its written form; nevertheless, it may be hard for them to reach an acceptable performance in its oral form. In a previous study, taking a cross section of Brazilian post-graduate students in the UK, it was found that factors affecting **speed, rhythm and intonation** are particularly important for the difficulties that English native speakers have in understanding their discourse. The present study was designed to determine whether the immersion in a native English community affects the performance of the same sample during a period of six months. The participants, 5 female and 5 male, had their spontaneous formal discourse recorded at the time of their arrival in the UK and six months later. Selected stretches, totalling 5 minutes each, were transcribed and analysed according to Brazil's approach for intonation as well as for factors affecting speed and rhythm. A total of 6191 tone units were analysed and the relevant data submitted to statistical analysis. As a result, it was found that: a – no important differences can be ascribed to sex; b –

speed increased due to a larger number of tone units and of syllables per tone unit per minute; c – rhythm, practically, did not change in the time considered; d – intonation varied with time in a slightly beneficial way; e – except for a decrease of incomplete tone units and of odd choices of tone, no meaningful signs of adaptation to the local intonation pattern was detected; f – the absolute predominance of flat pitched utterances suffered a significant increase with time, indicating the existence of a subjacent error-avoiding strategy. The value of Brazil's system for the performance of similar studies is underlined. A strong plea is made for the inclusion of the topic intonation in the syllabus of EFL teaching.

RESUMO

The influence of a native English-speaking environment on the pronunciation of

EFL Brazilian speakers – a study of the suprasegmentals

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Os falantes não nativos de uma determinada língua podem dominar sua forma escrita, porém pode lhes ser difícil alcançar um desempenho aceitável em sua forma oral. Em estudo anterior, utilizando uma amostra representativa de estudantes pós-graduandos no Reino Unido, verificou-se que fatores que afetam a **velocidade**, o **ritmo** e a **entoação**, contribuem de modo particular para as dificuldades que falantes nativos de inglês têm para entender o falar daqueles estudantes. Este trabalho foi concebido com o objetivo de determinar se a exposição a uma comunidade de falantes nativos de inglês durante o período de seis meses influi no desempenho desses estudantes brasileiros. O falar formal de 5 mulheres e 5 homens foi gravado na época de sua chegada ao Reino Unido e seis meses após. Trechos selecionados, totalizando 5 minutos cada, foram transcritos e analisados segundo a abordagem de Brazil para entoação, bem como para fatores que afetam a velocidade e o ritmo da fala. No total, 6191 unidades tonais foram analisadas e os respectivos dados submetidos à análise estatística. Como resultado, verificou-se que: a – não se podem atribuir diferenças

importantes a sexo ; **b** – o aumento do número de unidades tonais e de sílabas por unidade tonal por minuto causou aumento da velocidade da fala; **c** – o ritmo, praticamente, não sofreu alteração no tempo considerado; **d** – houve ligeira melhora na entoação nesse intervalo de tempo; **e** – a não ser por uma redução de unidades tonais incompletas e de escolhas incomuns de tom, não se perceberam sinais de adaptação ao padrão local de entoação; **f** – o predomínio absoluto de enunciados com modulação nivelada aumentou significativamente com o tempo, indicando a existência de uma estatégia subjacente para evitar o erro de entoação. Fica evidente a utilidade do sistema de Brazil para a realização de estudos semelhantes. Faz-se um veemente apelo pela inclusão do tópico *entoação* no conteúdo programático do ensino de inglês como língua estrangeira.

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CHAPTER 1

INTRODUCTION

It is very difficult to think of interactive communication without reference to spoken language. Though one can envisage interaction by other means, none is as effective, in a strict manner, as the interactive discourse to allow for complete communication.

The development of signs as an alternative for language has led to a complex system that, in spite of its intricacy, lacks a very important part of the body of information conveyed through spoken language. I refer to the features of the phonological category usually called suprasegmentals.

Non-native speakers (NNSs) of a particular language may very well master its written form; nevertheless, it may be very hard for them to reach an acceptable performance in its oral form.

It is as if a particular code of practice has been developed for the features mentioned above, which represent oral expression. This development most certainly occurs while the structuring of communities and nations takes place. It leads to the creation of the characteristics and the individuality of a particular language. Those who, by birth, acquire such common code constitute what one could call the native speakers of the language. For an outsider, in his attempt to

master that particular language, it is not reading nor writing, but speaking that usually constitutes the main obstacle.

Although written expression has become in the present days an important means of communication between peoples, spoken language is gaining importance with the improvement of instantaneous electronic communication. It is easy to perceive the advantages of spoken language, which enables the speaker to obtain information at first hand, with its full meaning, including those subtleties that are commonly irretrievable or irrecoverable in translation or dubbing. Here, features of discourse, beyond and above its written form, become very important. The recognition of this fact and of the important role of English as an international *lingua franca* justifies yet another piece of work devoted to intonation: in this particular case, to the problems of *intonation* affecting Brazilian EFL speakers.

For about two decades now, I have devoted considerable effort to the study of the pronunciation of Brazilian EFL speakers. Of the different aspects analysed, the incidence and persistence of pronunciation errors in a group of graduate students were measured (Garcia, 1983). It was found that errors in clause word prominence, such as the accentuation of any function words show the highest incidence and highest persistence while those referring to word stress are of low incidence and can easily be corrected. Deviations referring to alterations in rhythm, though of relatively low incidence, are very persistent. With intermediate incidence and persistence are the errors referring to the non-observance of reduced vowels in polysyllabic words. Testing of the group of students was done by means of the reading of a standard passage before and after

a module of instruction by using the audio-oral method. Their performance was compared to that of a native speaker of American English.

Later, further work on the pronunciation of Brazilian EFL speakers was carried out in Great Britain (Garcia, 1990) with a group of postgraduate students. The material analysed involved parts of spontaneous discourse recorded under standard conditions, as the informants were stimulated to speak in response to a standard question. Comprehensibility of their discourse was measured by submitting edited parts, in contrastive pairs, to 100 native English speakers who were asked to mark, in each pair, the informant they could understand better. After phonological analysis of the discourse, it was found that a certain number of features correlated negatively with comprehensibility. These features were *inserted vowels, wrongly placed tonic syllables, repeated words and wrongly placed prominences*. All these variables fall within the group which affects speed and rhythm. Though not appearing as a significant discriminating factor regarding comprehensibility, a characteristic tone profile, distinct from the English profile found in the literature, was apparent in the Brazilian EFL speakers' discourse. Their choice of tones was found to be, to a high degree, odd, and their discourse was marked by proclaiming (*p*) tones, hesitating (*o*) tones, and relatively dominant (*r+*) tones. Tones denoting politeness (*r* tones) and imposing feelings (*p+* tones) are almost absent from their spontaneous discourse.

The work reported here, *The influence of a native English speaking environment on the pronunciation of EFL Brazilian speakers − a study of the suprasegmentals*, was aimed at finding out whether the suprasegmental pattern of a group of Brazilian EFL speakers changes as a result of adaptation to a

predominantly native English speaking community such as the university ambience in the UK. It is hypothesized that the environment influences the intonation pattern of these speakers in the course of time.

It is recognized that EFL speakers may change their conversational performance after exposure to a native speaker's environment. Observation indicates that these changes reflect on lexical, syntactical and phonological aspects; they may as well reflect on the pronunciation pattern of their discourse. The present study is concerned with changes in the suprasegmental pattern only, and *time,* in a controlled way, will act as an independent variable.

Formal learning is sometimes a defective process, in that, besides the incompleteness of information regarding false cognates, subtleties due to the degree of formality, dialectical divergences, the student is, in general, unaware of the rules guiding pronunciation in the foreign language, especially in what concerns the suprasegmental features. Therefore, it is not surprising that students finishing a foreign language course feel shocked and, most often, meet with difficulties when immersed in a foreign language community: it takes a while for the process of acquisition to produce its effect.

The measurement of the effect of such an immersion on the suprasegmental pattern over a period of one semester is presented in this thesis. The Brazilian postgraduate students in the UK claim that they need five to six months for a reasonable adaptation to the local environment, especially in terms of communicating with shop-keepers, bus-drivers, colleagues and, most importantly, understanding their lecturers in class. Concerning spoken language, the research

questions are: Is this adaptation simply a passive procedure by which the Brazilian student develops skills to better understand the native speakers, or does it also involve a degree of active process with a modification of the language skills exhibited upon arrival in the U.K.? Does intonation, in particular, evolve towards the British pattern or does it remain within the Brazilian characteristic pattern?

The inclusion of the variable *sex* in this study is determined not only by the need for a set of informants as representative as possible of the population at large. It also follows the observations of a few linguists who have found sex differences in pronunciation among native speakers both in the U.K. and in the U.S.A.

Sex may very well be a factor of distinction in the intonation pattern. It is very likely that the native speakers' utterances, depending on sex, are conveyed in different ways as to phonological aspects, including intonation. Labov, according to Coulthard (1991:22-25), was the first investigator to describe accent differences related to sex. He found that women are more susceptible than men to the social meaning of accent.

It seems that in a given community the accent of the female members is closer to the prestige carrying dialect than that of their male counterparts. This is supported by the work of Milroy, cited by Coulthard (1987:45). She used Labov's methodology to study the correlation between social identification and dialect. According to Graddol and Swann (1989:67), 'social identity is not a static and monolithic thing. Different aspects of a persons's social identity may

be emphasized by different features of speech (accent, voice quality, use of certain vocabulary, etc) and these may vary from context to context.' They refer to Giles as having suggested, in 1980, that features of accent, there included intonation, could be used by men and women talking together to signal their common social identities as well as their respective gender.

With specific reference to intonation, Coulthard (ibid.) reports the studies of John Local who discovered a different tone profile between male and female speakers in Northeast England. Male speakers used mainly descending and level tones while females used mainly ascending tones. Unfortunately, he does not report the relationship between choice of tone and meaning. It is therefore impossible to determine if the sex differences in intonation are due to accent or to different interactive strategies. It is interesting to note that, in the effort to occupy their rightful space in society, politics and business included, women may resort to accent strategies that bring their speaking characteristics closer to the male counterparts. This is registered by Coates (1993:10) who mentions the use of lower pitch and of falling rather than rising tone patterns by women in their attempt to enter the former exclusively male areas of activity, such as teaching politics and business.

In the USA, again according to Coulthard (idem), Brend seems to have found sex related differences in intonation. Since there are differences that can be associated to sex, it seems worth trying to detect them in the Brazilian EFL speakers and to see how they evolve under the impact of the native speaking community. Therefore, an attempt was made at identifying pattern differences

between male and female participants upon their arrival in England as well as any possible differences in their rate of adaptation after a six-month period.

In summary, the objective of this research is **to find out whether the environment exerts any influence on the suprasegmental pattern in the discourse of Brazilian EFL speakers immersed in a native English speaking community in the UK.**

This objective leads to the first hypothesis, which states that **the intonation pattern** of the above described speakers **changes in the course of time** as a result of their immersion in the University ambience in the UK.

The second hypothesis states that **the female and male participants** in the study **exhibit different intonation patterns.**

In order to achieve my objective the following steps were carried out:

1 – description of the informants' performance while producing discourse intonation in formal situation upon arrival in England;

2 – description of their performance after six months in the country;

3 – comparison between the descriptions of both interviews (Time-1 and Time-2);

4 – comparison of the descriptions as to sex (Male and Female) in relation to both stages.

These comparisons should allow for measuring the changes in conversational situations resulting from exposure to the English-speaking environment in which the subjects were immersed. It should also allow for

correlating the selected variables *time* and *sex* with changes eventually detected in the suprasegmental pattern.

This work focuses on the description of speech production rather than on the investigation of perception or awareness of production. Some foreign language learners perceive the phonological features of the target language, and produce them, consciously or unconsciously. On the other hand, other students perceive the features, but do not produce them, while a third group of individuals apparently do not even perceive certain suprasegmental features; of course, they are unable to produce these speech components. The investigation of such a relation is outside the scope of the present study.

I hope that this research will contribute to further establishing intonation as a regular part of the normal EFL syllabus.

Data on the intonation patterns of interactive discourse in both English and Portuguese are scarce and usually limited to qualitative information. Crystal (1969:225) published an account of British tone patterns containing quantitative data, while Brazil, Coulthard and Johns (1980:13) give a qualitative impression of such patterns, different from Crystal's.

The first known attempts to describe the intonation pattern of Brazilian Portuguese using Brazil's approach were made by Konder et al. (1988; 1989, 1990). Their first two papers were on contrastive studies between the intonation patterns in Portuguese and English, referring to classroom instructions – 1988, and to the reading aloud of a story for children – 1989. The last paper is

concerned with the establishment of the intonation profile of questions and answers in Portuguese – 1990.

The work by Konder and her group was followed by Nunes' study (1991) in her first attempt to establish an orderly syllabus for the teaching of intonation. Viana (1992), in turn, presented Brazil's method as adequate for the description of the intonation pattern of interactive discourse in Brazilian Portuguese.

Having presented the main objective and the working hypotheses, a preview of the work reported in the following chapters is offered below.

Chapter 2 contains a review of the literature on suprasegmentals. It concentrates mainly on British sources, in preparation to the third chapter, which presents a selection of Brazil's approach to describing intonation.

The chapter on research methodology, chapter 4, apart from presenting the common techniques employed for the collection and processing of the data in the corpus, describes the specific procedures used for their analysis.

The fifth chapter is mainly devoted to the reading of the results obtained, in the form of tables, and to comments on their significance. The results themselves are included in the annexes in the form of numerical tables showing the results of the statistical analysis performed on the crude data. An Appendix reproducing the relevant parts of the annexes is included in the end of this book.

The discussion of the results is presented in the sixth chapter, where emphasis is placed on their meaning, from a quantitative and a qualitative view, and with reference to the hypotheses raised. The theoretical explanations of the findings, together with their applicability, are also included.

The seventh chapter consists of a strong plea for the inclusion of intonation as a subject in the EFL syllabus.

The conclusion contains the basic findings and my final considerations.

CHAPTER 2

SUPRASEGMENTALS

2.1 General Aspects on Suprasegmentals

Discourse is expressed through superimposed parallel structures: segmental and suprasegmental. Vowels and consonants, the phonic segments, form the segmental structure, while the suprasegmentals are *duration, intensity* and *pitch*. The ordinary, written form of discourse is only partly efficient in showing its suprasegmental characteristics.

The physical magnitudes attached to the suprasegmentals are *time, amplitude* and *frequency*; the last two belonging to the domain of wave phenomena. *Time* is related to the perception of *duration; amplitude* to that of *intensity;* and *frequency* to the *pitch* of the segmental sounds.

The linguistic function of the suprasegmental structure is usually viewed at two different levels: *word* and *sentence.* At word level there are three features, *duration, stress* and *tone,* while at sentence level they are referred to as *speed, rhythm* and *intonation.* Chart 1.1, adapted from Lehiste (1970:4), shows the correspondence between the physical magnitude, its perception, and the linguistic function of the suprasegmental features.

Lehiste's chart is very instructive and helpful in avoiding the common confusion between the fundamental concepts involving suprasegmentals. The first physical magnitude in the chart, *time,* is the independent variable in most

measurements. It can be perceived as the interval between successive events, – *time interval*, or, for a measurable event, its *duration*. *Speed* is defined as the number of events occurring in the time unit. Hence, in oral discourse, speed can be referred to the number of words or syllables per time unit, e.g. words per minute, or syllables per minute.

Chart 1.1 – SUPRASEGMENTALS

CORRESPONDENCE BETWEEN PHYSICAL MAGNITUDES

AND THEIR PERCEPTION AND LINGUISTIC FUNCTION

IN WORD AND SENTENCE

PHYSICAL MAGNITUDE	PERCEPTION	LINGUISTIC	FUNCTION
		Word	*sentence*
time	Duration	Duration	speed
amplitude	Intensity	Stress	rhythm
frequency	Pitch	Tone	intonation

The physical magnitude *amplitude* is related to the wave phenomena and is perceived as the *intensity* of sound, commonly called "volume". The linguistic function of amplitude is *stress* at the level of word and *rhythm* at the level of sentence. It is through stress that the accentuation of a word is determined. In a sentence, the function of amplitude is *rhythm*, which results from the regular alternation of "weak"and "strong" syllables or words.

As in the case of amplitude, *frequency* is also related to the wave phenomena. It is defined as the number of times a wave repeats itself in the interval corresponding to the time unit. In the domain of sound, the perception of frequency occurs by means of the pitch of the sound, commonly referred to as "high" or "low". The linguistic realization of frequency occurs at word level by means of *tone*, and, at sentence level by means of *intonation*.

2.2 The Discourse Fragment: Tone Unit

Speech is divided into parts, which depend on the speaker's need to recover breath or to isolate sequentially the meaningful elements of the utterance, thus conferring it structure and comprehensibility. According to Danes (1960:44-5), intonation is the determining agent for the limits of such parts of discourse. He calls these limits *junctures* and admits the existence of different degrees between junctures for the separation of hierarchically different fragments of the discourse. The hierarchic arrangement is determined by the pattern of the melodic line and by the duration of the connecting pause.

Brazilian authors recognize the existence of a minimal thought-carrying fragment of discourse, giving it different names: *strength group* (Câmara, 1977c:53-4), *phonic group* (Azevedo, 1971:14, 83) and *tone group* (Cagliari, 1980:129).

Among American authors both the concept and the denomination ascribed to that minimal fragment vary. Thus, for Lieberman (1967:108) it is *breath group* while for Prator & Robinett (1985:36) it is *thought group*. Ladefoged (1975:93), who coined the expression *tone group,* considers that it carries a

particular intonation pattern, and that there is generally only one salient syllable within this group, the *tonic syllable*. According to the same author, not a syntactic unit but an information unit is linked to the group.

The concern of the above authors with the feature they consider important in determining the individuality of these discourse fragments is transparent. So, strength group reflects concern with the suprasegmental feature intensity, considered by Istre (1980:97) the *strength feature* ("traço de força"); tone group reflects the importance given to pitch in determining the melodic pattern of the discourse fragment. Breath group, in turn, is solely based on the pause separating one fragment from the other.

From among the British authors, I shall consider Halliday and Brazil. Halliday's concern is directed to the function of the discourse fragment in terms of the information it carries. He proposes an *information unit* described as a functional part of discourse related to intonation and rhythm, which bears, however, no exact correspondence to any grammatical unit of the discourse. According to the author 'spoken discourse takes the form of a sequence of information units, one following the other in unbroken succession with no pause or discontinuity between them' (1985:274). Therefore, the phonologic tone unit corresponds to the semantic information unit. Brazil, in turn, presents a new and different approach, based on the occurrence of meaningful choices of tone. The name he uses for the discourse fragment is *tone unit*.

2.3 The Tone Unit and the Suprasegmental Features of Discourse

Once characterized, the tone unit can now serve as the physical basis of the suprasegmental features of discourse: speed, rhythm and intonation.

Speed is here understood as the amount of discourse produced in a time unit. Therefore, the number of tone units produced by an informant in a given time can easily indicate her/his discourse speed. On the other hand, the number of words per tone unit and the number of syllables per tone unit indicate how the discourse stretch considered flows from each one of the informants.

Rhythm is the suprasegmental feature of discourse that depends on the distribution of stress on the words in the sentence. The qualities of discourse that affect rhythm are number of prominences per tone unit, hesitations, wrong positioning of the word stress, of the prominent syllable, and of the tonic syllable.

Intonation, the main objective of this work, and the features that affect it, is discussed below.

2.4   The Description of Intonation

Intonation, the systematic patterning of prosodic features, is an important component of spoken discourse as changes in stress and pitch can express a variety of meanings. Clennell (1997:118), based on other authors, offers the following definitions:

> 'Intonation' is a broad term used by phoneticians to describe the effect of contrastive pitch movement (Crystal, 1987:423) on the meanings of utterances over stretches of speech (Cruttenden, 1986:9; Roach, 1983:112). Because stress (on a single word or in phrases) has as one of its chief acoustic correlates a change of pitch, we can consider both word and phrase stress to be subsumed under the term intonation (Brown et al. 1980:31). So intonation relates to the contrastive use of pitch movement over stretches of speech and the influence this has on meaning. 'Prosody' is a broader label, which includes stress and intonation, but also rhythm and voice quality as

well as other paralinguistic (non-verbal) features (Crystal, 1987:169). By using the broader term 'prosody' we make it clear that all these features play a significant part in delineating pragmatic intention.

In spite of the importance of the contribution of intonation to the meaning of discourse, not enough effort has been devoted to the study of this component, while other areas have received a lot of attention. It seems that only when other explanations fail is intonation called upon in the analysis of discourse. This fact is recognized by Coulthard (1985:96), who says, 'Appeal to intonation is spasmodic, if not haphazard, and occurs when differences are perceived for which there can be no other explanation'. '. . . any systematic relationship between physical changes and semantic ones has so far remained undiscovered' (idem, 1987:45), which I find regrettable.

The analysis of suprasegmental features involving meaningful choices, especially in spontaneous and interactive speech, is far more complex than that of lexis and sentence structure. Analysts must be trained to perceive with accuracy rhythmical changes and pitch movements within the speed of the subject's performance in an area where dictionaries and grammar books are of no help. Thanks to the work of Brazil (1995), it is now possible to talk of a code of practice for the analysis of the relation between intonation and meaning in spontaneous discourse.

Intonation analysis for description as well as for teaching purposes has been viewed from four perspectives: grammatical, attitudinal, functional and discourse oriented.

Halliday, Crystal and Roach have developed theoretical grounds for intonation analysis under grammatical, attitudinal and functional criteria. A synthesis of their work on the subject is given below.

M.A.K. Halliday

From the grammatical and functional perspectives, intonation has been analysed by Halliday (1967) for whom all English intonation contrasts can be stated in terms of grammatical or lexical meaning. Since English tones do not convey lexical meaning, he considered that 'intonation contrasts are grammatical' (p.10). Later, in *A course in spoken English: Intonation*, the same author asserts that intonation is 'a means of saying different things, (...). (It) is one of the many kinds of resources that are available in the language for making meaningful distinctions' (1970:21). While relating the meaning of his five primary tones to a set of speech functions, Halliday argues that intonation must be treated as a set of grammatical options by analogy with morphology and to the constituents organized within the frame of a sentence.

In Halliday's *Introduction to functional grammar* (1985), Chapter 8 is devoted to intonation and rhythm. The title denotes very clearly the role ascribed to such features within the book: *Beside the clause: Intonation and Rhythm*. His view, then, is that 'English is a language in which a relatively heavy semantic load is carried by rhythm and intonation' (p.271 – emphasis added). He proceeds to classify the features of the phonological constituency into *foot* and *tone group*, the first as 'the rhythmic unit of the language' and the second 'a higher

constituent, which is the melodic unit of the language'. Therefore, the tone group is to be regarded as 'the unit of intonation' (p.273-4). Later, in the second edition of the book (1994:292), a rewording of the statement reads:

> All natural discourse in spoken English is made up of an unbroken succession of tone groups or "feet"; we shall see below that both the foot and, more especially, the tone group play an important part in the construction of meaning. Such "prosodic" patterns are found in every language, although both the patterns themselves and their semantic loading may differ significantly from one language to another.

Halliday is concerned with the functional difference between the tone group and the foot when expressing meaning in English; he denies the foot the ability to realize any semantic unit. According to him, the grammatical function is there for the realizations in meaning. He compares the foot to the syllable in the grammatical rank: 'it is a phonological constituent, but does not represent a constituent of any other kind' (ibid.).

The *information unit* is defined as a functional part of discourse related to intonation and rhythm, which, however, bears no exact correspondence to any grammatical unit of the discourse. The analysis of the information unit, though based on phonological features, becomes bound, therefore, to its significance in terms of the quality of the information it carries.

Information, as used by Halliday, 'is a process of interaction between what is already known or predictable and what is new or unpredictable. (...) Hence the information unit is a structure made up of two functions, the New and the Given' (1985:274-5), in which the New is marked by tonic *prominence*. The tonic prominence is featured by the main pitch movement, in which the tonic element,

syllable or foot, is the carrier of this prominence and which 'is said to be carrying *information focus*' (p. 275). Additionally, the author assigns the pretonic contour 'further choices in meaning, (...) but only a complete foot, one with a salient syllable in it, can embody an intonation choice' (p.283).

The concept of *tone* is introduced as a departure from text to interactive discourse and as an additional function of the information unit embodied in the choice of tone. I think it would be better to free the information unit from a textual function and align it completely within the interpersonal semantic system, especially when one considers its role in the exchange of meaningful utterances between participants in an unfolding interactive talk.

Halliday's *tone system* is based on *primary tones*. These are divided into five *simple tones* numbered 1 to 5 – 4 and 5 are said to be complex tones – and two *compound tones*. The compound tones are simple combinations of tone 1 and tone 3, making up for tone 13 (one-three, not thirteen) and of tone 5 and tone 3, making up for tone 53 (five-three). This system has been kept consistent in the author's publications through at least fifteen years (1970-1985).

A summarized version of Halliday's tone system, based on his book of 1985, is given below:

Tone 1: *falling,* ↘. This tone conveys certainty, unmarked realisation of a statement, and the realization of a wh-question - what is in question is the identity of some particular participant or circumstance, the answer will never be *yes/no*. This is the most frequent tone.

Tone 2: *rising,* ✎ . It conveys uncertainty and the realization of a *yes/no-*question. Tone 2 is more common in dialogues than in narrative. Together with tone 5, it is far less used than tone 3.

Tone 3: *level,* ⟶ . It is usually referred to as 'low-rising'. It neutralizes the opposition falling-rising and means 'not (yet) decided whether known or unknown'; in addition it is dependent on something else – provisional, tentative, afterthought. This tone is the third in frequency, though trailing far behind tone 4, the second more frequent.

Tone 4: *falling-rising,* ⤵. This tone means 'seems certain, but turns out not to be'. It is usually associated with reservations and conditions. This tone is the second most frequent.

Tone 5: *rising-falling,* ⤴ . Tone 5 means 'seems uncertain, but turns out to be certain'. It is used on strong, contradicting assertions, and also implies 'you ought to know that'. Tone 5 is characteristic of children's speech.

Compound tones 13,⤵→, and 53,⤴→. The combination of tone 3 with either tone 1 or tone 5 is treated as a single tone.

In the compound tone each component keeps its original meaning. Compound tones occur with clause-final adjuncts and with other clause final elements that are semi-new, that is, previously mentioned, but still newsworthy. According to Halliday, tones 23 or 43 do not exist, since tones 2 and 4 are rising tones. In this case, the addition of a final rise is not phonologically distinctive.

Key is seen in a completely different perspective and, although homonym, bears no correlation with the same word in Brazil's theory (Brazil, 1985:66-103).

For Halliday 'the semantic values of key' are realized by the choice of tone. Key is expressed 'prosodically, by the *tone contour*, the melodic movement of the tone group' (p.281 – emphasis added). If prosody is associated with the study of salient syllables or words as well as of the melody of phrases or utterances, it should be linked to the study of intonation in its full range of meaning. If key implies choice of tone and if this choice is semantically meaningful, it is difficult to understand and accept why not have tone contours included in his discussion about intonation and rhythm. Key is defined as 'the meaning of the tone in its paradigmatic environment, i.e., in association with other, non-intonational choices (those of mood)' (p.285).

After learning Halliday's intonational system, the impression retained is that it is structured in hierarchic tiers, such as the elements which constitute the grammatical rank scale: it starts with the *phoneme* and goes up the ladder, through the *syllable* and the *foot*, to the top, the *tone group*. Some doubt can be raised about its practical applicability to natural conversation, since it needs a more flexible system for its analysis.

D. Crystal

Crystal's prosodic system is based on the analysis of a corpus 'of some eight hours of informal, spontaneous conversation constituting several varieties of educated southern British English' (1975:12). The various relationships involved are presented diagrammatically, indicating that the most direct route connecting meaning and phonetic substance goes through cognitive information, lexical items, lexical tone and segmental phonology. This route, however, omits other elements, which are also considered essential for the correlation between meaning and phonetic substance. Cognitive information is not only connected through lexical items but also across the syntactical elements called structures. These are connected to phonetic substance through lexical tone and segmental phonology as well. Thus, cognitive information is divided into lexical and structural, or syntactic aspects at the same level of another type, affective information, also known as attitudinal information. Affective information, syntactic and lexical items are connected to phonetic substance through a set of phonological aspects which the author includes in the group of non-segmental phonology, or, suprasegmental phonology. Of these, paralinguistic and other prosodic patterns serve as means of connection to affective information only. Affective information and structures share nuclear type items, that is, syllabic pitch range and nuclear tone, while tone-unit connects structures, and tonicity, lexical items.

For Crystal, the distinction between segmental and non-segmental phonology is controversial. He makes four empirical claims (ibid:13):

1 – the placement of tone-unit boundaries is determined by syntactic structure;

2 – tonicity is primarily determined by lexical or semantic factors; alternatively, it is determined by structures or affective information, since it is indirectly dependent on syntax in that tonicity requires the prior establishment of a tone-unit to define its domain, and tone-units are determined syntactically;

3 – nuclear types are determined both by structural and affective meaning;

4 – other prosodic and paralinguistic patterns are determined by affective meaning, and are unaffected by syntax or lexis.

An interesting point is raised by the author stating that 'other prosodic and paralinguistic patterns outrank tone-unit and other intonational organization' (ibid:15) implying that speed is the variable responsible for the number of tone-units in an utterance, and that this number varies in inverse relation to speed. This may be of particular importance for the comprehension of non-native discourse, where an abnormally high number of tone-units introduce an additional factor of distraction for the native interlocutor.

The author raises some aspects connected to the influence of affective involvement in the determination of meaning and phonetic substance (ibid:21-2; 38-9). Among the possible explanations for the difficulty in predicting the tone unit boundaries of less than 1% (0,833...%) of his 12.000 tone unit corpus, Crystal mentions the attitude of the speaker (ibid:21). It might be of interest to

study the effect of the psychological inhibition of a non-native speaker on his/her performance. As mentioned above, speed is an important factor for the determination of the number of tone units and, under the stress of their linguistic ability in a foreign language, non-native speakers may resort to discourse strategies involving speed.

It seems that affective information may also influence the character of interactive discourse by the introduction of more or less formality as a result of the presence of a person who may not be well known to the other speakers. In fact, the author reports one such case 'where an observable change in the accompanying situation directly influenced the intonation. (...) a third speaker entered the room; as he was a stranger to one of the participants, the speech became more formal and the intonation altered' (ibid:32).

Previously, in *Prosodic systems and intonation in English* (1969), Crystal proposed a very detailed description of the phonologic options. However, he did not attempt to assign meanings to the various options; moreover, it seemed very difficult, if not impossible, for him to reach any valid generalizations. In his 1975 publication, Crystal organized his tones 'on the basis of their twofold potential function, grammatical and attitudinal' (p. 38-41). This was said after having stated that 'the vast majority of tones in connected speech carry no meaning – that is, they communicate no new meaning, because their occurrence is syntactically predictable' (p. 34).

According to the author, the meaning of these tones is dependent on a combination of the meaning of the simple pitch range feature selected plus the meaning of the nucleus (p.212). The pitch range may be simple or complex.

A summarized version of Crystal's tone system (1969:225) is given below:

Chart 2.1 - Summary of English Tone Systems

	Simple	Complex	Compound
Basic types	↓ ↑ →	∨ ∧	↓+↑ ↑+↓
Secondary types		∧↑ ∨↓	∧+↑ ∨↑+↓
			↓+ →

The author admits that 'if pressed to be more constructive and specific', he would 'propose the existence of absolute levels, and would hypothesize that people operate with at least three pitch reference-areas (norm, low, high), within which any system of intonation analysis must be accommodated' (p.83). No provision is made for a fourth level resulting from strong emotional feelings. It is important to note that he refers to pitch reference-"areas" instead of reference-"levels", thus allowing for the variation implied in the word "area" as opposed to a more defined value contained in "level".

It seems important to point out that the reproducibility of intonation levels is not based upon the reproduction of a succession of absolute frequencies but rather on the reproduction of a set of variations of frequency intervals, regardless of what the initial frequency may be. It operates in the same manner as different

instruments in an orchestra playing the same melody but each one in its particular register. This is in agreement with Crystal's model (p.78), which includes an area of "free variation", defined for a particular intonational feature between two different initial levels. In other words, the same intonational feature may have its origin at different levels, and be represented by two parallel lines depicting a change in pitch, produced by two different individuals.

An important role is attributed to non-segmental distinctions resulting from social factors and to the objectives related to the speech situation and the degree of formality or intimacy between interacting speakers. It becomes apparent that the measurement of intonational features in formal and informal discourse is well justified.

In order to examine the nature of the non-segmental variation in poetry when read aloud, the author performed experiments by asking his informants to indicate the separation of the lines according to the prosodic features of the reading. It was found that only a few of the informants were able to identify the correct end of each line. This is what in Brazil's approach is referred to as **orientation** (1985:200-22).

Crystal's discussion about metrical theory involves several interpretations of the term *metre* as used by different scholars. Particularly confusing are his labels *stress, accent* and *prominence*, especially when added to the notions of *quantity, loudness, ictus, tonic, rhythm* and *tempo*. He, very appropriately, regrets the absence of any regular analysis of metrical literature in other

languages, for 'over-concentration on a single language (English) inevitably leads to premature generalizations, and these abound in metrics' (pp.107-8).

Statements, which originate from such generalizations, affect the judgement about the rhythmic distinction between syllable-timed and stress-timed languages. It may be possible to find a combination of both kinds in the same language. Cagliari (1981) argues for a stress-timed rhythm of Portuguese spoken in São Paulo as the result of his analysis. He says that the "gaúcho" dialect is syllable-timed. On the other hand, Bisol (1984) did not hide her surprise at such a statement, since she considers the "gaucho" dialect stress-timed. It is quite possible that Cagliari's reference was to the "fronteiriço" area (borderline with Argentina and Uruguay), where the Spanish-speaking neighbours certainly influence the variety of Portuguese spoken by Brazilians in that area – Spanish is a syllable-timed language. In all fairness, it must be said that later, 1996, as referred by Jenkins (1998a), Crystal admitted that 'English may be moving towards the syllable-timed end of the stress/syllable-timing continuum, under the influence of other world languages in general and of rap music in particular.'

Grammatical and attitudinal categories are often cumbersome and confusing to classify, in addition to being difficult to remember for both learner and teacher. For example, a) *wh-questions* are marked by falling contours when the speaker expects information in return, and by rising contours when he just wants clarification, or confirmation, or repetition – grammatically related; b) falling tones may indicate boredom (especially with narrow voice range), certainty, familiarity, agreement or contradiction – attitudinally related.

P. Roach

Roach's *English Phonetics and Phonology* (1988) is devoted to the teaching of English pronunciation having in mind the non-native speaker. Three chapters, 15 to 17 (p.112-35) focus on the subject matter Intonation. It is Roach's view that 'no definition (of intonation) is completely satisfactory, but any attempt at a definition must recognize that the *pitch* of the voice plays the most important part'(p.112). Of course, in this case, pitch should be understood in relation to "relative pitch". And again, the correct procedure is not to analyse all aspects of an individual's pitch, but only those, which are relevant for conveying some communicative information. Three conditions have been established by the author in order to consider pitch differences linguistically significant (p. 113):

1 – they should be under the speaker's control;

2 – they must be perceptible;

3 – they must allow for contrasts so as to be looked at within a set of phonological units.

While engaged in a conversation, speakers do want their utterances to be heard in such a way that the listeners understand them correctly. Therefore, the participants must select, from a choice of tones, those, which are meaningful to both parties.

At introducing the concept of *tone-unit* the author says, parenthetically, 'intonation and stress are the vocal equivalent of written punctuation' (p.121). It follows that the system for transcribing the intonational features must be as

accurate as to allow for a faithful reproduction of the utterances by any reader who knows the notational system. Capital letters and signs to indicate punctuation will become redundant. There are still too many systems being offered for the notation of intonational features of spoken discourse. It seems that a lot more work has to be devoted to the task of perfectioning such systems in the hope that a universally accepted system can come through.

The fall-rise tone, ∨↗, (p.127-8) is said to offer problems of identification: when a one-syllable tail follows the tonic syllable and there is a voiceless medial consonant, which causes a break in the voicing, as in
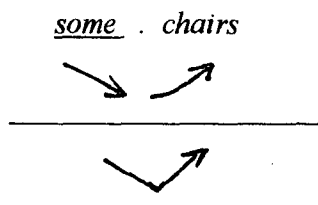
some . _chairs_

with a falling tone on _some_ and a rising movement on _chairs_. It seems that the perception of prominence on _some_, compared to the lack of prominence on _chairs_, should be enough to identify a fall-rise tone with the tonic syllable on _some_. The situation is similar with the rise-fall tone, ∧↘, having a one-syllable tail after the tonic syllable and a voiceless medial consonant between them, as in

_no_ . _sir_
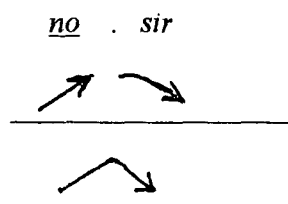
In the presentation of the functions of intonation, (p.136-7), Roach, after describing these functions as *attitudinal, accentual, grammatical* and *discourse,* emphasizes the fact that there is an overlap between discourse function and the other three. However, in spite of their overlapping, one should not think that by analysing discourse intonation we are, at the same time, describing attitudinal, accentual and grammatical functions of intonation. The overlap underlines their close relationship but does not abolish their individuality.

In the first part of the discussion on functions of intonation, the author turns his attention to the suprasegmental variables: *sequential, prosodic* and *paralinguistic.* The first variable includes the intonational elements which occur in sequence and never simultaneously, as the components which structure the tone-units: pauses, boundaries, tonic syllables with their possible pre-heads, heads and tails, including their pitch variability. The second variable, regarded as part of intonation along with the sequential components, embodies width of pitch range, key, loudness, speed and voice quality. The last one comprises body language: eye-contact, facial expression, gestures and body movements, as well as vocal effects – laughs and sobs; although conveying relevant information concerning emotional feelings, these are considered inappropriate as components of intonation.

The author's remarks about the teaching of the attitudinal use of intonation (p.141-2) are very sensible and appropriate. Nevertheless, teachers not previously and extensively exposed to the environment of the native speaking of English will hardly appreciate the features involved. They must also be fully aware of the difficulties of foreigners struggling to assimilate this particular

aspect of the speaking of a foreign language, that is, the effective and adequate use of the prosodic features.

The explanation of accentual function (p.143-5) is conducive to understanding that the placement of tonic stress – "prominence" in Brazil's system – is a function of intonation: 'placement of tonic stress is (...) closely linked to intonation'. This implies that the formerly called "sentence stress" belongs to the domain of intonation, while word stress is independent of any choice in the unfolding spoken discourse.

As to the discourse function, the author's comments on factors regulating **turn-taking** in conversational interaction (p.150) point to an unexpressed conclusion: that spoken discourse has to be taken as a complex entity, composed of segmental, suprasegmental and parasegmental elements which are inextricably related, the analysis of any of its components resulting impossible without considering the influence of either of the others. In his conclusions, Roach goes halfway to expressing this idea, but raises some cautious observations on the danger of too broad an understanding of such generalizations.

In the section *High and low heads* (p. 129-32), the author illustrates the pitch differences of stressed syllables in the head, that is, in the segment, which precedes the tonic syllable. Roach identifies two pitch heights for strong syllables in the head, high and low; these syllables are labelled *high head* and *low head*. The pitch of the high head is usually higher than the beginning pitch of the tonic syllable; likewise, the pitch of the low head is usually lower than the beginning pitch of the tonic syllable. The concept of high and low heads seems

to correspond to Brazil's subsystem key, but allowing for two choices only – high and low, instead of three – high, mid and low. There is no mention to the meaningful selection of pitch height on the tonic syllable, in other words, to Brazil's subsystem called *termination*, along with its relation to *key*.

2.4. Closing Remarks

This chapter presented part of the theoretical basis of intonation together with the views of selected authors on its description and their respective tone systems. This is the background against which the next chapter has been conceived. It contains the views and system as proposed by Brazil.

CHAPTER 3

INTONATION ACCORDING TO DAVID BRAZIL

3.1   Introduction

This chapter is intended to summarize the conceptual and theoretical foundations of Brazil's approach to the description of intonation. It is largely based on his book *The Communicative Value of Intonation in English* (CVI) (1985).

Brazil's system was chosen for the tone analysis because it allows for an interactionally motivated description of intonation. It represents an advantage over other systems more inclined to a grammatical or attitudinal description, disregarding the meaning of the discourse conveyed by the tone structure.

Brazil has built up his system upon four principles:

   1 – features that are acoustically in a continuum must be analysed as realizations of a small number of discrete units;

   2 – there is no constant relationship between particular acoustic phenomena and particular analytic categories; it is contrasts and not absolute values, which are important;

   3 – there is no necessary one-to-one relationship between paralinguistic cues and interaction significance; and,

4 – intonation is primarily concerned with adding specific interaction significance to lexico-grammatical items (Coulthard, 1987:46).

Brazil considers the tone unit the most important among the units of structure – syllable, segment, tone unit and pitch sequence – and believes it to be "the most likely unit of neurolinguistic pre-assembly" (op. cit.: 47).

The author shows how the system of intonation affects the communicative value of English utterances in interactive discourse. His framework allows for the identification and description of meaningful oppositions, analysed in three different sub-systems: tone, key and termination – each one with its own communicative significance.

Since the focus is on utterances in their natural context, that is, in normally used language originated in the here-and-now of situations, the characterisation of intonational features is not related with grammatical categories, such as declarative or interrogative sentence-type, nor with the speaker's attitudes or emotional feelings. Brazil's view is essentially pragmatic in the sense that it is phonological, communicative and discourse-bound.

In the following sections an abstract of the relevant parts of Brazil's CVI is presented, covering Tone Unit, Prominence, Key and Termination, Tone, and Orientation, and including a Summary of Conventions.

3.2 Tone Unit

Tone unit (*tu*) is the stretch of language, which carries the systemically opposed features of intonation. It consists of distinctive non-systemic

characteristics: variation in pitch, loudness and time, which may interact in different ways in modifying the composition of any utterance.

Pauses are closely related to *tu*s and are helpful in identifying the boundaries of each *tu*. However, they must not be regarded as criterial.

Each *tu* has one, two or more syllables, which the hearer recognizes as being stronger, heavier in intensity or more emphatic than the others are. These syllables are said to have prominence, a feature that distinguishes them from the other syllables in the same *tu*. As notational devices, capital letters represent prominent syllables and double slanting lines indicate the separation of *tu*s, as in the following example

(1) // I think on the WHOLE // that THESE ofFICials // // do a reMARKably good JOB //

in which there are three *tu*s and two prominent syllables in each unit. Examples of only one prominent syllable per unit can be found in the different ways of producing the second *tu*, as follows

(2) // that these ofFICials //, or // that THESE officials //.

Prominence is closely related to 'stress' or 'accent' and the distribution of prominent syllables may seem to be determined by the lexis and grammar of the utterance, since the syllable -MARK- in **remarkably** is prominent. However, each speaker has alternatives in the way of producing some *tu*s. For instance, utterance (1) could be said this way

(3) // i THINK on the WHOLE // that THESE ofFICials // do a remarkably GOOD JOB //, or // do a reMARKably GOOD job //.

Prominence is the result of an act of selection in which the speaker is involved. This selection conveys a meaningful sense to this feature.

There is another option that a speaker will make while producing a *tu*. In addition to the binary prominent/non-prominent decision, s/he has to choose a certain pitch movement, or tone, which is connected to the last prominent syllable in the *tu*. This syllable, referred to as the tonic syllable, is the point on which the tone system functions. The tonic syllables constitute a sub-set of prominent syllables. It is the incidence of prominence that fixes the domain of a tonic segment: the first prominent syllable is the onset syllable and the last one, the tonic syllable.

The tonic syllables in the first three *tu*s of utterance (1) exemplify the tones described as 'falling-rising', 'rising', and 'falling', respectively, as follows

WHOLE, ofFICials, JOB.

In transcription, the tonic syllable will be underlined, as in

(4) // I think on the WHOLE // that THESE officials //

do a reMARKably good JOB //.

A horizontal line just before the tone unit transcribes the 'level' tone:

(5)   //→ THAT //, //→ AND //.

The complete set of possible choices of *tu*s is falling – , rising – , falling-rising – , rising-falling – , and level – .

While keeping the same pitch movement in

(6) // do a reMARKably good JOB //,

where both prominent syllables are pitched at 'mid' (*m*) level, it is possible to vary the height on the last one, where the fall begins, which is the tonic syllable. In the example

(7) // do a reMARKably good   //

JOB

the falling tone begins in a 'low' (*l*) pitch if compared to the level of the preceding prominent syllable -MARK-. Another possibility would be

JOB

(8) // do a reMARKably good   //

in which the tonic syllable is pitched at 'high' (*h*) level.

Any prominent syllable preceding the tonic syllable in its *tu* will be referred to as onset syllable, as mentioned before. It is part of a sub-set of prominent syllables and is complementary to the tonic syllable. There is no pitch-movement choice associated with the onset syllable; it will, however, be placed at a high – *h*, mid – *m*, or low – *l* level pitch, as in utterance (1), which may be said as follows

(9) // I think on the WHOLE // that THESE officials // do a reMARKably good   //.

JOB

The syllable "I" is said to be *h* onset, THESE and -MARK- are *m* onset, while syllables WHOLE and -FIC- are considered *m* tonic and JOB is *l* tonic.

The pitch of each onset syllable is determined by comparing it to that of the previous onset syllable. Thus, the syllable THESE is at *m* level in relation to the pitch of the preceding onset syllable I, *h* pitched.

The pitch choice associated with the onset syllable, or first prominent syllable, will be referred to as key (*K*) and that associated with the tonic syllable, or last prominent syllable, as termination (*T*).

In order to determine the pitch-tag for K & T, the intonation analyst must know the pitch range of the speaker. Based on this knowledge, the mid-level can be established. In relation to that level, K and T tags can be ascribed.

There may be *tus* with no onset syllable, that is, the first prominent syllable will also be the last. This is the case of a *tu* with only one prominent syllable, which carries the pitch movement, the tonic syllable. In the utterance below

<div align="center">PAper</div>

(10) // that they're reQUIRED // on   //

the pitch level at -QUIRED represents a simultaneous choice of mid key (*mK*) and mid termination (*mT*), while that at PA- represents a selection of *h* level in both systems – *K* and *T* – which combine freely with all tone choices.

Comparing the following *tus*

	I think on the WHOLE	
that	THESE	ofFIC ials
do a re	MARKably good JOB	

three segments can be identified : 1– a proclitic segment preceding the *tu*; 2– a central segment called the tonic segment; and 3– an enclitic segment following the latter. The proclitic and enclitic segments are optional elements and contain no prominent syllables, nor do they participate in the selectional potentiality of the *tu*. The segments in the three *tu*s above are termed extended tonic segments, in opposition to the minimal tonic segments in the following examples

Proclitic segment	Tonic segment	Enclitic segment
that they are re	QUIRED	
on	PA	per

The tonic syllable is an indispensable element in the tonic segment and, of course, in the *tu*, and the decision to consider only one tonic syllable for each *tu* is based upon descriptive matters motivated by the meaning system.

3.3   Prominence

Prominence is an attribute of the word, and prominent words realise sense selection. This selection is related to the existential paradigm, a term used when there is incompatibility, that is, limitation by sense, with reference to the set of possibilities that a speaker can count on as available in a specific situation. It stands in opposition to the general paradigm, which refers to the entire language system. The words comprised in the existential paradigm form a sub-set of those in the general paradigm.

Shared understanding between speaker and hearer in natural conversation determines the extent of the existential paradigm, reducing it to only one possibility since no selection is involved. The utterances

Q – What heart did you play?

(11) A – // the QUEEN of hearts //, or // the QUEEN //;

Q – Which queen did you play?

(12) A – // the queen of HEARTS //, or // HEARTS //;

Q – Who else have you invited?

(13) A – // JANE sarah and Edith //, and

// a bottle of Johnny WALKer //

demonstrate that shared knowledge of card-playing conventions, experience of the immediate conversational environment, culture-wide acquaintance with a particular sequence of names, as well as shared expectations determine the elimination of alternatives and, as a result, the allocation of prominent and non-prominent syllables, or words.

The specific time and place of any utterance provides a conversational setting for each *tu*. This setting will include shared awareness of what has been said before. The awareness compromises some elements, which are known to the participants and some newly created ones, and probably some elements which will never be repeated, that originate in the ongoing discourse within the context of interaction.

Utterance (11) projects the assumption that 'hearts' is a non-selective item. This assumption is part of the communicative value of that utterance. The speaker may choose to make his utterance entangle some presumed state of affairs, or he may exploit his opportunity to choose, and represent the state of affairs the way he wants the hearer to see it, as in

Q – Did you say insolent officer?

(15) A – // NO // insolent ofFICial //.

The projection is meant to reflect the recently-created situation, being evident that the word "insolent" is non-selective. However, there is a contrastive opposition with

(16) // INsolent ofFICial //

where "insolent" presents a selection from a set of possibilities in the existential paradigm in conformity to a particular official. Existential paradigm is defined as that set of possibilities that a speaker can regard as actually available in a given situation. All intonation choices are available for exploitation and prominent syllables are to be regarded as embodying these choices from known alternatives. It is for this reason that the system of prominence figures in the account of the communicative value of utterances.

The different kinds of speaker choice are always related to two different kinds of sense unit: one realized by the word – prominent, non-prominent – and the other by the tonic syllable, for example:

Q – What card did you play?

	word	word	word	word
(17) A –	// the	QUEEN	of	HEARTS //

tonic segment
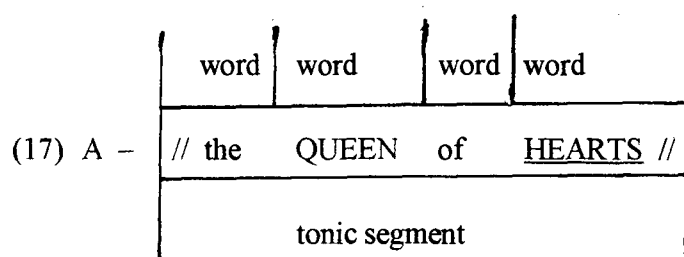
3.4 Key and Termination

Choices of pitch level serve to determine the K (key) and T (termination), systems that are realized by h (high), m (mid) or l (low) pitch of voice, each of which has its own significance in a contextualized utterance. K refers to the pitch of the first prominent syllable of a tonic segment, while T refers to the last prominent syllable, which is the tonic syllable, the one that carries the pitch movement.

3.4.1 Key

The K system enables the speaker to project an existentially valid contrast by opposing a pair of possibilities and excluding, at the same time, one of them. It functions in relation to the information enclosed in the previous tu, thus being regressive; in other words, a key choice is made in relation to the key choice in the previous tu, or to a notional baseline in the case of the first tu in a stretch of discourse. It has arbitrarily been assumed that hK is followed by hT and mK by mT.

hK, mK and lK refer to the pitch level of the first prominent syllable, that is, to the onset of the tu. hK has contrastive implications, as in

(18) // AS for the SECond half of the game //

UNbeLIEVable

// it was   //,

and also conveys the sense of particularizing, as in

JOHN'S new SECretary

(19) // it's   //,

and in word quotation:

ElecTROLysis

(20) // and the WORD for this process // is   //.

When additive intention is meant, *mK* will be used, for example

(21)   //   Only a SMALL number of people   //   SOMEthing like HALF   //

// ACtually turned UP //.

lK is equative, indicating a cause-effect relationship

(22) // the SPEAKer was ILL // the

LECture was CANcelled //,

in which the two assertions account for the same thing, or expressing a simple

additive relationship:

(23) // it is NOT the lawyer's JOB // to deCIDE what is RIGHT //

// and   //.

WHAT is WRONG

3.4.2 Termination

In the system of T the options also refer to an h, m or l pitch of voice, as they do for K, but at the end of the tu, that is, on the last prominent syllable, the one that carries the pitch movement.

The effect of T is to decide upon an aspect of the context of interaction projected by the speaker. It is a means by which the speaker may restrict the addressee's freedom of choice. The latter may adjudicate or concur, that is, may decide about or agree; at times, however, his independent view will not make T match with choice, or else, when concord breaking may occur.

Instructions given by an adult to a child, using mT, like

(24) // PUT it <u>DOWN</u> //

can be said to anticipate concurrence. It expects a non-verbal reaction, which may or may not come together with an mK 'yes', meaning agreement, since the child is not invited to adjudicate. If he does not 'put it down', exasperation may then be expressed by hT, as in

<u>DOWN</u>

(25) // PUT it   //,

for which immediate non-verbal response is expected. The adjudication invited by hT is considered independent 'activity', and the concurrence expected by mT is a manifestation of 'passivity'. To decide is to be 'active'. The choice of hT or mT projects an expectation of continuance in hK or mK, respectively, by the

following speaker. In this sense, it is said to be progressive. *IT* indicates that the speaker has finished what he wanted to say, for example

SAW

(26) // i   <u>PE</u>ter //   he was CHANGing his   //.

<u>LI</u>brary book

It projects no expectation that the following utterance will begin with a particular K choice, which may be h, m or l.

In minimal tonic segments there is no possibility of making the selection of K and T independently; in other words, if there is only one prominent syllable in the *tu*, the pitch level for K as well as that for T will be on the same syllable. The onset syllable of the tonic segment coincides with the syllable that carries the pitch movement, that is, the tonic syllable. For example:

<u>LOST</u>   (hK and hT = surprise/contrast, adjudication)

(27) // he <u>GAM</u>bled // and <u>LOST</u> // (mK and mT = addition, concurrence)

<u>LOST</u>   (lK and lT = equation, finality)

In the first instance, hK-hT, the interpretation according to Brazil would be *surprise* or *contrast*, or *adjudication*. However, because there is only one-syllable word to carry both *Key* and *Termination*, their meanings become undissociated. The high pitch is not only an expression of the unexpected, in the case of key, as it is also an expression of expectation of a decision, as in a 'yes or no' question, in the case of termination. Monosyllabic-word tone units carry, by

force, both meanings. Analogously, the same can be said of the other two situations: *mK-mT* and *lK-lT*.

3.5 Tone

The pitch movement that begins at every tonic syllable provides a system of five tones – falling (⭘), rising (⭘), falling-rising (⭘), rising-falling (⭘), and level (⭘) – which constitute a five-term choice for the speaker at each *tu* he utters. If s/he does not choose one of the five, the *tu* will sound incomplete. In order to establish the relationship that is held among parts of the language systems, specifically as to intonation, it is necessary to look at the consequences of choosing one tone in preference to another.

An intonation choice can be associated with a syllable only if it is prominent. The need to make a particular tone choice may be sufficient reason for assigning prominence to a syllable; in other words, a tonic syllable is always prominent.

3.5.1 The *P/R* Opposition

The tone which carries the falling-rising, ⭘, movement is called referring tone (*r*) and stands in opposition to the proclaiming tone (*p*), ⭘, with a falling pitch movement.

The subject matter of the *tu* with *r* is presented by the speaker as being present in the common ground, which means that it is already "in play" in the conversation. The speaker indicates that this part of the discourse will not change the state of convergence between the addressee and her/himself.

The subject matter of the *tu* with *p* is presented as not yet present in the common ground. By proclaiming a part of her/his discourse, the speaker declares her/his expectation that this will increase the area of convergence: it tells the hearer something s/he did not yet know.

The state of convergence is an aspect of the context of interaction to which all intonation choices are related. If the context of interaction is the product of the ongoing conversation, referring *tus* can be seen as making retrospective reference to elements in the recorded text. These elements must not necessarily have been mentioned, for the speaker may assume that they can be taken for granted as shared knowledge, as items of interest by public notice or any other means. In the following example

(29)   A – // *p* WHEN do they <u>CLOSE</u> //

  B – // *p* FOUR o'<u>CLOCK</u> // *r* at <u>THIS</u> time of year //,

it is already-negotiated common ground that speaker A means "now" and not "at any other season". Therefore, *p* is used by speaker B for the new information in the first *tu* and *r* for the shared-world, self-evident meaning in the second *tu*. The decisions concerning tone choice are made by each speaker, as are any other decisions in a language system.

Adverbials like "actually", "frankly", "personally", "really", "to tell you the truth", with *r* tones, are common in informal conversation, insinuating a certain degree of intimacy or solidarity. They serve as a kind of hand-on-your-shoulder gesture.

Surprise or incredulity can be attributed to tones, *p* and *r*, but the highest degree of incredulity is attached to the combination of *hT* and *r* tone.

No particular intonation and no special combination of choices can be identified as specifically interrogative. The combination of *p* tone plus *mT* is uncommon in most kinds of discourse, except for some professionals, such as policemen and physicians, when being particularly careful about the collection of facts. However, *p* tone plus *hT* as well as *r* tone plus either *mT* or *hT* is commonly associated with declarative mood elicitation.

Considerations of who knows what about whose intentions are located in the unique conversational nexus called the context of interaction.

The speaker's worldview, as in the question

(31) // *p* WILL you have COFfee //

suggests that "coffee" is one of a range of things the hearer might care to drink, such as "tea", "chocolate" or of things to do, like "going for a walk" or "taking a rest" instead of "having coffee". With an *r* tone, there is no implication that there is a choice. The hearer is asked to concur with a proposal that the speaker presents as if the fact of having coffee had already been settled.

The same approach followed for yes/no-questions will account for the significance of the *P/R* relation for information questions. With both types of questions, the choice of r tone projects the speaker's wish to have his assumptions confirmed with respect to a truth, which he expresses as having been negotiated. The use of a *p* tone, on the other hand, means that the respondent is expected to provide a choice from an unnegotiated set. In short, an *r* tone may be

interpreted as "I think I know the answer; please tell me whether I am right", and a *p* tone generally corresponds to "I don't know the answer; please tell me".

Social elicitations can be interpreted in relation to social conditions of separateness and togetherness. Phatic questions aim at something like social bridge building; therefore, they will generally have an *r* tone, which insinuates togetherness, for example

(32) // *r* HOW ARE you //.

The same question produced with a *p* tone would not be phatic, but would sound like a physician's question, like a genuine interested question on how effective his last prescription has been.

The primary intention of a yes/no question with *r* tone is to establish a comfortable social relationship, resulting in a ritualised procedure so that the truth of the answer is scarcely a consideration.

All choices in the *P/R* system contribute separative or associative implications to the tonic segment. The meaning opposition that these two tones realize is related to the complementary states of separateness and convergence that characterize the speaker/hearer relationship at the moment when each successive *tu* is produced. They constitute a closed set, exhausting the possibilities of choice in the particular paradigm they represent. In normal conversation, all *tu*s have the function of proclaiming or referring.

3.5.2 The '+' Version for Dominance

There are some verbal encounters, such as school lessons and doctor-patient consultations, in which it is easy to recognize a dominant role, and many other encounters with unequal distribution of conversational rights.

In certain circumstances, there is a dominant speaker who has a choice of two courses of action, whereas the non-dominant participant does not. In relation to the choice of tone, the dominant participant may choose either a p or $p+$ tone when he wants to proclaim, or an r or $r+$ tone when he wants to refer. The non-dominant speaker must use a p or an r tone. In other words, the dominant speaker is able to make a meaning distinction that the non-dominant speaker is not supposed to make. The $p+$ tone is realized by a rising-falling pitch movement and the $r+$ by a falling-rising movement, as seen before.

Brazil finds that the use of $r+$ tones is relatively uncommon. When speakers intend to convey their superior conversational role, they seem to do so in order to invoke social convergence. The values most commonly ascribed to some uses of $r+$ in popular, common sense language are forcefulness and emphasis.

People who are in the position of having to give instructions commonly adopt the intonation that marks the dominant speaker. They reflect the consciousness of the possession of desired knowledge, and seem to feel: "If you listen to me, I'll tell you what you want to know", as in the following example

(33) // $r+$ AFter the ROUNDabout // p TURN LEFT //,

which may be part of a sequence of directions a pedestrian would give a driver.

An interaction relationship with imperative mood overtly signals the speaker's assumption of dominant role.

The continuous implication of *r+* tones is well demonstrated in story telling, for listeners are being asked to recall a shared tradition rather than being told anything new. The teller must continuously reiterate his dominant status and insist on his expectation to be allowed to go on uninterrupted.

The effects of choosing an *r* or *r+* tone are noticeable in questions that are asked for the benefit of the speaker and those asked for the benefit of the hearer. The offer

(34) // *r+* CAN i HELP you //

sounds warmer than it would with a simple *r* tone, which could suggest a mere routine.

An *r+* tone also has the function of redrawing the convergence of interaction by reminding the hearer of something he may have forgotten.

A *p+* tone serves exclamatory utterances, such as

(35) // *p+* it's RAINing // (Who'd have thought it!),

in which the speaker is heard as proclaiming the fact at the very moment of discovering it for himself, and in which he uses a dominant prerogative to change the state of his world. He registers his own observation that it is raining and simultaneously indicates that he expects no feedback of adjudication or concurrence that is, of decision or agreement.

Most of the *p*+ tones encountered in data or noticed in overheard speech have been in situations where dominance serves to mark the here-and-now modification of the speaker's worldview.

In questions with a *p*+ tone, as

(36) // *p*+ WHY don't you ASK him //,

the meaning is characterized by forcefulness or insistence, since the speaker overtly takes up a dominant role.

3.6 Orientation

Reading aloud with contextual projections, as though they were acts of communication, in which case the reader would bring up a given state of convergence, a listener-sensitive stance, interpreting the text as if the message originated from him, is called *direct* orientation. On the contrary, when the reader considers his text a specimen of the language, reading it out simply to inform about what is printed on the paper, giving no communicative significance in anyone's world, he is producing *oblique* orientation. The tones most commonly present in oblique orientation are the *p* and the *o* tone that is, proclaiming and level tone.

The intonational features manifested in reading out also belong to various kinds of speech activity, which can be grouped under the heading of "precoded". It includes oft-repeated business – repeated language formulae produced as a routine performance, such as parade-ground commands, public recitation of prayers and other liturgical material. Classroom interaction also favours oblique orientation, as in strings of directives like:

(37) // *o* STOP <u>WRIT</u>ing // *o* PUT your pens <u>DOWN</u> //

// *o* LOOK this <u>WAY</u> //,

a semi-ritualized practice; and in the kind of template-technique teachers use for

checking the students' understanding of items already explained, for example

(38) Teacher – // *o* the LONGest side <u>IS</u> // ...

Pupil – // *p* the hy<u>POT</u>enuse //,

in which the pupil is asked to complete the linguistic specimen.

An *o* tone often precedes a pause, introduced for thought or for effect, as in

(39) // *o* THEN <u>THE</u> // ... // *p* <u>SYS</u>tem was changed //.

Pauses arise from a real need for planning time. Since they are always

treated as *tu* boundaries, the point of breaking off a *tu* and the associated pause

are criterial references for transcription purposes.

Inappropriate concern with the phonetic facts should be avoided. One

should seek to establish the formal oppositions even if this means being rather

vague about how the physical realizations are to be recognized. Pitch, loudness

and time are continuously variable attributes of the speech signal.

3.7   Summary of Conventions

The following is a brief summary of the values and of the transcription

conventions adopted in Brazil's system.

Prominence

Prominent syllables are written in upper case letters.

Onset and Tonic Syllables

The first upper case syllable in a tone unit, when it is not the tonic syllable, is the onset syllable. The prominent syllable, which carries the pitch movement in the tone unit, is the tonic syllable.

Tone Units

The boundary of each tone unit is indicated by // .

Tone

Tone choices are indicated at the beginning of the tone unit. There are five significant tones:

r tone (↘↗)   falling-rising tone: shared knowledge; convergence and solidarity, gentle reminder;

r+ tone (↗)   rising tone: the speaker urges recall of information not given in the context, dominant authority;

p tone (↘)   falling tone: new information (That's what I mean to say), individuality, separative implication;

p+ tone (↗↘)   falling-rising tone: new information given with authority, unexpectedness for both (speaker and listener), dominance;

o tone (→→)   level tone: hesitation, verbal planning;

R   denotes *r* tone and *r+* tone;

P   denotes *p* tone and *p+* tone.

Key and *Termination*

Key   pitch of the onset syllable

high key (hK)   syllable placed above the line: surprise, against the expectation, contrastive, separate-and-unrelated, disjunctive;

mid Key (mK)   syllable placed on the line: adding to, additive within the situational context, separate-but-related;

low key (lK)   syllable placed below the line: equative, equivalence within the existential paradigm.

Termination   pitch of the tonic syllable

high Termination (hT) syllable placed above the line: adjudicative, expectation of a decision, asks for *yes/no*;

mid Termination (mT) concurrence, expects agreement;

low Termination (lT) syllable placed below the line: finality, no expectation of continuation.

In a tone unit with only one prominent syllable – tonic syllable, key and termination are selected simultaneously.

Key is related to the key of the previous *tu*; in the first *tu* in a stretch of discourse, it is relative to a notional basis.

Termination is related to the previous key, the onset syllable in the same *tu*, or the key in the previous *tu*.

3.8 Concluding Remarks

I hope that the above presentation of David Brazil's discourse model for the analysis of intonation will serve to justify my choice of his system. It was used to perform the phonological analysis of the formal discourse stretches produced by Brazilian post-graduate students in the U.K. It was intended to show its advantages over other well-known systems throughout the discussion in the preceding chapter. It is worth drawing special attention here to the unique features of Brazil's system of phonological analysis. Though sophisticated and precise, it is a user-friendly system that helps to prevent misclassification of the discourse fragments analysed.

CHAPTER 4

RESEARCH METHODOLOGY

4.1   Introductory Notes

This chapter begins with a description of the procedures followed for the collection, processing, and selection of materials to form the corpus. Details of the methodology for the intonation analysis come next. In closing, information about the handling of the data by means of statistical analysis is offered.

4.2   Intonation Pattern

The intonation pattern of each subject's formal interactive discourse was established by means of the analysis of recordings collected on two occasions:

1 – upon arrival of the Brazilian graduate students to Great Britain; and

2 – six months afterwards.

An evaluation of the changes in the production of intonation features was made as an attempt to determine what modifications would occur in the observed time interval and whether they follow any tendency.

4.3   Data Collection

4.3.1 Subjects

The subjects were recruited from among newly arrived Brazilian graduate students at the Universities of Birmingham, Warwick, York, Leeds, Durham and London, regardless of age or field of study, provided they had not had previous

experience in an English speaking country and were not devoted to linguistic studies.

After a preliminary selection, based on the criteria listed below, the work started with a group of eighteen individuals. Appointments were arranged for each one.

Criteria for the selection:

1 – being a native Brazilian;

2 – having acquired a standard background in the English language in Brazil;

3 – having recently arrived in England;

4 – having come to England to stay for six months at least;

5 – being a postgraduate student at an English University;

6 – not being devoted to linguistic studies;

7 – not having previously studied, or lived, in English speaking countries;

8 – not having been raised in English speaking homes.

These criteria ensured that the informants were common Brazilians who had tried to improve their performance in the English language using the means normally available in Brazil to persons intending to pursue post-graduate studies in the U.K. Therefore, their presence in the U.K. indicated that they had passed the standard British Council proficiency test in the English language. Under

these criteria, it was assured that any native English-speaking environment would not have influenced the informants' accent. Thus, the informants had had a regular training in English and were expected to be unaware of any problem related to Linguistics, especially the intricacies of the suprasegmentals.

4.3.2 Recordings

A formal conversation between each subject and an **interlocutor**, her/his supervisor, or a senior staff member of the Department of English, University of Birmingham, was recorded on magnetic tape.

The meetings of the subjects with their interlocutor took place in the office of the interlocutor. The interlocutor was asked to conduct the discussion with the informant in a way that would keep her/him interested in supplying information on a familiar subject. It was suggested that the discussion should concentrate on

1 – the student's work or study at the University,

2 – her/his previous studies and,

3– professional aims in the future.

Six months later the same procedure was repeated with each subject and, whenever possible, with her/his previous interlocutor.

The interviews were arranged to last from 20 to 45 minutes and were held in my absence.

The arrangements for the interviews were not always successful for a number of reasons, such as travel by the informant or her/his interlocutor, illness

or other commitments. For this reason, the group of subjects finally selected for this study was limited to 10, five female and five male, who had both interviews at Time 1 and Time 2 performed at the right occasion and in good technical conditions.

4.4   Editing and Intonational Transcription

The first step of the procedure to obtain an excerpt of the recordings, suitable for the preparation of the transcriptions, was to have an overall impression of the discourse by listening to each interview from start to end, at least three times. Since the cassette player had a built-in revolution meter, the parts of the discourse suitable for analysis were noted for subsequent search. These parts, in which the informant had a major participation in the conversation were considered suitable. A register of the duration of such parts, excluding the time spent by the subject's interlocutor, was made with the aid of an electronic stopwatch.

Following this preliminary inspection, each interview was edited so as to obtain excerpts totalling 5 minutes, taken from the middle portion of the interview, when the conversation was flowing freely from both participants. Only the discourse corresponding to the Brazilian student was accounted for the study.

The five-minute excerpts were then converted into written transcriptions. Based on the listening of the recording, each transcription was divided into tone units and the intonational features marked appropriately. Therefore, the corpus of this work is based on the tone unit. An average of 280 tone units for each five-minute excerpt was found.

The notation used for the markings referred above was based on Brazil's method, as described in Chapter 3.

4.5   Intonation Analysis

The analysis of the intonational features of the discourse was made under quantitative and qualitative criteria in order to compare the subjects' performance on both recorded interviews. The first interview is hereafter referred to as Time 1 as well as the second interview is referred to as Time 2. The list below contains the quantitative variables measured as well as their abbreviations:

a – number of tone units – NRTU;

b – number of words – WORD;

c – number of syllables – SYLL;

d – number of prominences – PROM;

e – number of wrongly placed word stresses – WPWS;

f – number of wrongly placed prominent syllables – WPPS;

g – number of wrongly placed tonic syllables – WPTS.

Variables *a, b, c,* and *d* above measure the features affecting speed; variables *d, e, f,* and *g* correspond to features affecting rhythm. Variable *d,* number of prominences, is obviously a feature related to both suprasegmentals, speed and rhythm.

It must be emphasized here that all measurements, quantitative and qualitative, refer to the discourse contained in five-minute stretches.

The non-numeric variables were named and grouped as qualitative variables. Their reading required the classification of the tone unit as one of two, or more options. These variables constitute the group that determines the intonation pattern of the population under study. Their names, abbreviations and respective options are given below:

a – range of intonation contours produced – TONE,

    options: *p*, *p+*, *r*, *r+*, *o*, *I*.

b – meaningful choices of tone – ADEQ,

    options: *Odd*, *Unremarkable*;

c – key and termination pattern – KT,

    options: H–H = High–High,

                 H–M = High–Mid,

                 H–L = High–Low,

                 M–H = Mid–High,

                 M–M = Mid–Mid,

                 M–L = Mid–Low,

                 L–H = Low–High,

                 L–M = Low–Mid,

                 L–L = Low–Low;

d – production of hesitation sign – ER,

options: Y = Yes,   N = No.

The following criteria, used in order to determine the performance of the subjects on most of these features, are mainly based on a preliminary study of interactive discourse of Brazilian postgraduate students at the University of Birmingham. The corpus of that study was submitted to a native experienced linguist who did the markings corresponding to the expected performance. The informants' performance was then compared to that standard (Garcia, 1990):

Number of tone units – NRTU: The subjects in that study tended to use an excess of tone units in their discourse, e.g.

// *p* i THINK[ ] // *p* it was necesSARy // *p* TO // // *p* to GO // *p* TO //
   // *r+* GUILD of STUdents //

six tone units, instead of

// *p* i THINK it was necessary to go to guild of STUdents //

one tone unit, according to the *expected* performance used for comparison.

Number of prominences – PROM: The measurement of this feature was made because an abnormal use of prominences per tone unit was found, e.g.

// *p* JUST ONE PICture //; // *r+* FOR THIS //

instead of

// *p* just ONE PICture //, or // *p* JUST ONE picture //,

or

// *p* just ONE picture //; // *r+* for THIS //.

Number of wrongly placed word stresses – WPWS: The record of this kind of mistake, or error, refers to words with two or more syllables, e.g.

returned ['r ɪ t ɜˑn d]

instead of

[r ɪ' t ɜˑn d];

necessary [n ɛ s ə' s æ r ɪ]

instead of

['n ɛ s ə s æ r ɪ] or ['n ɛ s ə s r ɪ].

Number of wrongly placed prominent syllables – WPPS and *number of wrongly placed tonic syllables* – WPTS: Mistakes, or errors, of this type refer to the shift of prominences and of tonic syllables, e.g.

// *p* and SHE conTACT to MY // *p* LAND_LAdy //

instead of

// *p* and SHE CONtact to my // *p* LANDlady //,

and

// *r+* PUT your registration NUMber //

instead of

// *r+* PUT your regisTRAtion number //.

Range of intonation contours chosen – Tone Profile: This feature concerns the type of pitch contours, or tones, present in the subject's discourse as well as their relative frequency. The registering of this feature allows for the comparison with the English intonation contours described in the literature (e.g. Crystal, 1969 and Brazil, 1985).

Meaningful choices of tone – ODD or UNREM: The proper choice of tone represents a very difficult task for the non-native speaker as it requires a good deal of experience before the strategies of choice are learnt. This variable was included on the assumption that the subjects tend to perform more under the influence of the strategies of their mother tongue than according to those used in English. The evaluation was made by counting *unremarkable* vs *odd*, or wrong, decisions in the case of a *P/R* opposition. The computation of odd choices of tone in the case of *o tus* was not carried out.

The intonation patterns obtained according to the parameters mentioned above were compared as follows:

a – patterns produced in two different occasions – Time 1 and Time 2;

b – patterns produced by female and male subjects – *Sex*.

The small number of individuals (ten) representing the population under study is a limiting factor to the attempt to make a statistical analysis of the distribution of the tone frequency. A qualitative comparison was however possible as can be seen in Chapter 5.

4.6 Data Analysis and Statistical Procedure

4.6.1 Transcripts

Handwritten transcripts of the selected discourse stretches of each interview were prepared. Sufficient space between lines was kept so as to allow for the marking of the features analysed, as mentioned in section 4.4. A sample is shown in Fig.4.1.

The sample sheet in Fig. 4.1 belongs to the corpus of this work which contains the transcription of all the tone units analysed – 6191, and the markings corresponding to the analysis. The transcription follows Brazil's model, as described in Chapter 3. The informants are numbered from 0 to 9. The series from 0 to 4 corresponds to the female group; and from 5 to 9, to the male group. The interviews are numbered 1 or 2, according to having been recorded upon arrival of the informant to the UK – Time 1; or six months later – Time 2.

The tone units are numbered consecutively for each informant and for each interview. By this means, and in order to prepare for the ensuing statistico-analytical procedures employed, each tone unit has an individual number against which all its characteristics are referred.

The markings obeyed the following conventions:

1 – double slanted bars indicating the beginning and closing of the tone unit;

2 – the symbol for the corresponding tone, either *p*, *r*, *p+*, *r+*, or, *o*; in the case of incomplete tone units, *I* , an x was used to substitute the symbol of the tone; incomplete tone units are utterances which do not include a prominent syllable, and, consequently, there is no tonic syllable; therefore, they lack the essential feature of a tone unit;

3 – in a tone unit, the unstressed syllables are written in small characters; the stressed, or prominent, syllables, in capital letters; the prominent syllable that carries the pitch movement, the tone, is underlined;

4 – the position of the syllables in relation to the line is an indication of their function in terms of *key* and *termination;* syllables written *above, on* or *below* the line represent *high*, *mid,* or *low key* or *termination;* the onset syllable or, in other words, the first prominent syllable holds the key feature; the last prominent syllables, in turn, signals the termination feature; in the case of monosyllabic tone units, the classification for key and termination, in terms of pitch, is coincident; this coincidence occurred in a very large number of the tone units analysed in the corpus, as will be seen later, in Chapter 5.

To this point, the information between slanted double bars refers to the intonational features of each tone unit. Upon occurrence of an *ODD* choice of tone, the small letter o is written on top of the marking corresponding to the tone. A capital letter **P** on top of a prominent syllable indicates a *wrongly placed*

prominent syllable; likewise, a capital letter T indicates a *wrongly placed tonic syllable* .

The **number of words** in the tone unit is indicated by an Arabic number followed by the small letter *w*. The indication of the **number of syllables** in the tone unit is given by an Arabic number followed by the small letter *s* . Both indications are placed next to the slanted double bars which correspond to the closing of the tone unit.

Occasionally, very odd pronunciation occurrencies are indicated above the respective segment in the form of symbols of the International Phonetic Alphabet. See for instance, tone unit 51.

The the markings of all the features, as seen above, were transferred to handmade spreadsheets, as shown in Fig 4.2.

The handmade spreadsheets are divided into six sectors, from left to right. The first sector contains the identification elements for each tone unit, involving the informant, characteristics of the interview and the number of the tone unit in three digits.

The second sector contains the variables referring to the structural information about the tone unit, such as number of words, number of syllables and number of prominences, together with the analytical elements referring to wrongly placed stress (*wpwst*), wrongly placed prominent syllable (*wppsyl*) and wrongly placed tonic syllable (*wptsyl*).

The third sector contains the record of the tone choice for each tone unit, allowing for the five tones defined in Brazil's system, p , r , $p+$ $r+$, o and a column for the recording of the incomplete tone units (x).

The fourth sector registers the adequacy of the choice of tone, whether odd or unremarkable.

The fifth sector refers to the features related to the variables key and termination. It admits all the alternatives from high key and high termination – (HH) through mid key and mid termination – (MM) to low key and low termination – (LL).

The last sector of Fig.4.2 registers the occurrence of ER, the sign of hesitation. The registration of this feature is conditioned to the existence of an underlying tonic syllable.

After careful checking, the data referring to each tone unit were fed into a microcomputer utilizing a FOXPRO program for the organization of a database file. The printed form of this database file constitutes the Annex I to this work comprising 137 pages. It contains the individual data belonging to each tone-unit, the result of the analysis of the discourse stretches taken from each of the 20 interviews.

A sample page of Annex I is shown in Fig. 4.3. Each page contains data regarding the informant, her/his sex, the interview, and the total number of tone units produced in the five-minute excerpt selected from the interview The first column refers to the number of the tone unit, and the other ten comuns rerfer to the ten variables under which the statistical analysis was performed, namely:

WORD stands for number of words in the tone unit;

SYLL, for number of syllables;

TONE, for the choice of tone;

PROM, for the number of prominences;

WPWS, for number of wrongly placed word stresses;

WPPS, for number of wrongly placed prominent syllables;

WPTS, for wrongly placed tonic syllables;

PROP, for the adequacy of the choice of tone; UNR, for unremarkable; ODD, for odd choices of tone;

KT, for key and termination; and

ER, for the presence – Y, or the absence – N of this sign of hesitation.

The database file represented by Annex I, constitutes the substract upon which the statistical data analysis is perfomed.

4.6.2 Data Analysis

In order to handle the high amount of data generated in this work, a powerful computational tool was necessary. For its well-known capabilities the SPSS (Statistical Package for the Social Sciences) program was chosen. Its 'one-way cross tabulations' feature provided the cross tabulations needed to assess the interrelation between the independent variables (*time, sex*) and the measured variables. For the purpose of the analysis, the dependent variables were classified into two groups: "quantitative variables" and "qualitative variables".

The first ones are those whose reading can be expressed in numbers, such as number of words, of syllables, or of wrongly placed tonic syllables. Under qualitative variables the non-numeric variables are grouped, e.g. key and termination, whose reading required classifying from a menu of options (high-high, high-mid, high-low, etc.). Although containing some of the tabulations referring to qualitative variables, Annex II is the source for all tables referring to the quantitative variables. Annex III is the source for most of the tables referring to qualitative variables utilized in the presentation of the results (Chapter 5).

For the convenience of the reader, an Appendix was organized, and is located at the end of this book. It contains copies of the source pages mentioned above, as well as of those referred to along the text.

F 4 — formal 1   63

ot   o'   Hk   o'   LAST   P.T   o'   P.T
from 48.//p the   TIME // 3w-3s; 49//p THAT my SUperVIsor //3w-6s

49. o'
Ht 50.//o ER //1w-1s; 51.// p WAS IN bra (im) ZIL // 3w-4s

51.   P
    52.//o HE SPENTs //2w-2s; 53.//p ONE MONTH //2w-2s

53.
o'   o'2.w-2s P.T   1w-1s   P.T
    54.//p BUTs I // 55.//x i d// 56.//o I.// 1w-1s

55.-56.
Tsyl   3w-2s   from   P   P.T
from 57.//p DIDn't[r][və] // 58.//o I d i d I //3w-3s

58.
Tsyl o' R 3w-2s. (-)from   See t. u nº 296, 297   o'   P.T
o from 59.//o i DIDn't [r] // 60.//p i DIDn't [l]er //4w-3s

60.
Tsyl o'   o'   (-)from
from 61.//x i d er //2w-2s; 62.// p i DIDn't [r] //3w-2s

62.
    P.T
    63.//o I'm //2w-1s   64.//x i didn't //3w-2s

64.
                              P
    65.// p NO //1w-1s 66.// r+ i AM NOT s // 3w-3s

66.
    1w-1s
    67.//p NO //   68.//p SORry // 1w-2s

68.
    P
    4w-4s   2w-3s
    69.//p i AM NOTs THERE //   70.//o beCAUSE in //

70.23   70

Figure 4.1– Fac-simile of a sheet of handwritten transcripts.

Figure 4.2 – Fac-simile of a handmade spreadsheet. Each row refers to one tone unit, with the key for its identification and the record of the data corresponding to the variable represented at the top of each column.

```
Results from the Interviews                              Informant: 4
------------------------------------------------------------------------

Interview: Second              Sex:  Female              NRTU: 278

Unit   Word   Syll   Tone   Prom   WPWS   WPFS   WPTS   Prop   KT    Er
```

Unit	Word	Syll	Tone	Prom	WPWS	WPFS	WPTS	Prop	KT	Er
099	3	2	0	1	0	1	1	Unr	MM	N
100	4	5	P	2	0	0	0	Unr	MH	N
101	5	5	0	2	0	1	1	Unr	MM	N
102	2	2	I	-	-	-	-	-	---	-
103	3	6	P	2	0	0	0	Unr	MH	N
104	3	4	0	1	0	0	0	Unr	MM	N
105	2	7	P	2	0	0	0	Unr	MH	N
106	2	5	R	2	1	2	1	Unr	MM	N
107	2	4	P	2	0	0	0	Unr	MM	N
108	4	5	0	2	0	0	0	Unr	MM	N
109	3	3	P	2	0	1	0	Unr	MM	N
110	1	1	0	1	0	0	0	Unr	MM	N
111	1	4	P	1	0	0	0	Unr	MM	N
112	4	5	0	2	0	0	0	Unr	MM	N
113	1	3	P	1	0	0	0	Unr	MM	N
114	1	1	0	1	0	0	0	Unr	MM	N
115	3	6	P	2	0	0	0	Unr	MM	N
116	1	1	P	1	0	0	0	Unr	MM	N
117	3	7	P	2	1	1	1	Unr	ML	N
118	4	5	P	2	1	2	1	Unr	ML	N
119	4	8	0	2	1	1	1	Unr	ML	N
120	2	3	P	2	0	0	0	Unr	ML	N
121	2	2	I	-	-	-	-	-	---	-
122	1	1	P	1	0	0	0	Unr	MM	Y
123	6	7	P	3	0	1	0	Odd	MM	N
124	3	3	R	1	0	0	0	Unr	MM	N
125	4	4	R	1	0	0	0	Unr	MM	N
126	3	5	P	2	0	1	0	Unr	ML	N
127	2	3	R	1	0	0	0	Unr	MM	N
128	1	1	0	1	0	0	0	Unr	MM	Y
129	4	7	0	2	1	1	0	Unr	MM	N
130	3	3	P	2	0	1	0	Odd	MM	N
131	5	5	P	2	0	0	0	Unr	ML	N
132	2	3	P	2	0	0	0	Unr	ML	N
133	2	2	0	1	0	0	0	Unr	HH	N
134	5	5	0	3	0	1	0	Unr	HM	N
135	3	3	0	2	0	1	1	Unr	MM	N
136	2	4	P	1	0	0	0	Unr	MM	N
137	3	6	P	2	0	1	0	Odd	MH	N
138	3	3	0	1	0	0	0	Unr	MM	N
139	4	4	P	1	0	0	0	Unr	HH	N
140	3	3	I	-	-	-	-	-	---	-
141	2	3	0	1	0	0	0	Unr	MM	N
142	2	4	P	1	0	0	0	Unr	MM	N
143	3	4	0	2	0	0	0	Unr	HH	N
144	2	2	I	-	-	-	-	-	---	-
145	3	4	0	2	0	1	0	Unr	MM	N
146	3	3	0	1	0	0	0	Unr	MM	N
147	2	3	P	1	0	0	0	Unr	MM	N

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                                                        Page  A-60
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Figure 4.3. – Fac-simile of source-page A-60 from Annex 1. Please refer to section 4.6.1. for details.

CHAPTER 5

RESULTS

5.1   Introduction

The results obtained by the application of the set of rules and procedures defined in the preceding chapter are given as follows.

The computation of the ten variables for each of a total of 6191 tone units is given in Annex I (A-I). The observation of the data shows a great variability of the results obtained. It is very difficult to distinguish the performance of one subject from another regarding sex or time of collection of the data. The variability of the results within the same interview (Time 1 or Time 2), for the same informant or between informants, does not allow for the perception of the differences at which the work is aimed. The reason for this difficulty lies in the great mass of data resulting from the phonologic analysis of 6191 tone units under 22 possible variations of the variables. Therefore, it was necessary to submit the data to a set of analytic procedures in order to identify the existing differences and to determine which of these are significant. The product of such procedures, processed results, is presented in Annex II (A-II) and in Annex III (A-III). A-II contains the statistic analysis of the quantitative variables, that is, all those expressed by numbers or frequencies. A-III contains the statistic analysis of the qualitative variables, those referring to the tone profile, to the performance of key and termination, and to the occurrence of signs of hesitation.

5.2   Incomplete Tone Units

A total of 6191 tone units were analysed; of these, 576, or 9.3%, were incomplete. Incomplete tone units are those parts of discourse that contain a certain number of words but remain unfulfilled. These do not contain the essential part of a tone unit, i.e., they do not contain the 'tonic syllable', which carries prominence and pitch movement. They were taken into account only as far as the variables *number of words* and *number of syllables* are concerned, for they are an integral part of the total amount of discourse produced and analysed. In order to calculate the results of the distribution of the tone profile, the incomplete tone units were listed in all tables in the column named *incomplete* (A-I). However, for the purposes of statistical analysis, the other variables of the incomplete tone units are not included in the column of results *valid percent*; they appear as *missing observations* (A-II and A-III).

5.3   Summary Tables and Preliminary Discussion

The set of tables below summarizes the processed results, and is grouped according to certain aspects of the analysis. These tables were prepared on the basis of the data contained in A-II and A-III. The title of each table identifies the dependent variable that is represented against the independent variables *time* and *sex*. In each table, the values of significance and **level of significance (level,** in short) read at the bottom of each column refer to the differences between the mean values of the variable concerned, depending on *sex*. The same values, when read from left to right in each row, refer to the differences between the mean values of the variable concerned, depending on *time*.

A brief description and a preliminary discussion of the quantitative meaning of these tables is also given. The purpose of this brief discussion is to provide some assistance for the reader in the interpretation of the tables. An interim interpretation of the results from the point of view of the objectives of this work is also offered. A further discussion and integration of the results is provided in the next chapter.

The number of the source pages in A-II and A-III can be found at the right-hand side at the bottom of each table, in parenthesis (small characters). For the convenience of the reader, an Appendix was organized. It contains copies of these source pages, as well as of the pages mentioned along the text. Where applicable, ratio values are given as mean plus or minus standard deviation (MEAN +/- SD). Tables under sections 5.3.1 and 5.3.2 refer to the quantitative variables. The qualitative variables are dealt with under section 5.3.3. Quantitative and qualitative variables are defined in Intonation Analysis (4.4). Section 5.3.4 presents the results referring to the performance of each informant.

The variables have also been classified in respect to discourse. The first group comprises those referring to **discourse features affecting speed**, such as number of tone units, number of tone units per subject, number of words per tone unit and number of syllables per tone unit. These features are referred to the five-minute excerpt used for the intonation analysis. The second group, **discourse features affecting rhythm,** such as signs of hesitation, wrongly placed word stresses, number of prominences per tone unit, wrongly placed prominent syllables and wrongly placed tonic syllables. The last group includes **features related to intonation,** which are prominence, tone, key and termination.

5.3.1 Discourse Features Affecting Speed

The tables and discussion included in this section refer to data derived from the measurement of the quantitative variables, namely number of tone units, number of tone units per subject, number of words per tone unit, and number of syllables per tone unit. The numbers of words per tone unit and of syllables per tone unit are representative of the amount of information a speaker is able to produce in a single spell of her/his discourse.

Tables 5.1, 5.2 and 5.3 provide the possibility to comment on some general features of the discourse structure of the population under study. As mentioned before, the *corpus* is formed by stretches of discourse totalling 5 minutes for each subject, that is to say, not including the time her/his interlocutor spent while talking. Therefore, it is possible to compare the actual amount of discourse produced by each group of subjects, female or male, and to see how they evolved in the period of six months between Time 1 and Time 2.

First (see Table 5.1), observe that the number of tone units (NRTU) for the female group is smaller than the same number for the male group and that the difference between groups (Fem and Male) is highly significant in Time 1 as well as in Time 2. Second, it can be seen that the production, in terms of tone units for both groups, has increased from Time 1 to Time 2.

TABLE 5.1

NUMBER OF TONE UNITS AND NUMBER OF TONE UNITS PER SUBJECT
WITH DIFFERENCES RELATED TO SEX AND TIME

	TIME 1		TIME 2		TOTAL	SIGNIF	LEVEL
	NRTU	NRTU/ Subj MEAN+/-SD	NRTU	NRTU/ Subj MEAN+/-SD			
Fem	1354	272+/-23	1459	296+/-37	2813	0.0000	<1%
Male	1617	335+/-27	1761	352+/-14	3378	0.0000	<1%
Total	2971	301+/-36	3220	327+/-39	6191	0.0000	<1%
Signif		0.0000		0.0000			
Level		<1%		<1%			

(A-II: 34,42,78,86,94)

TABLE 5.2

NUMBER OF WORDS PER TONE UNIT
WITH DIFFERENCES RELATED TO SEX AND TIME

	TIME 1 MEAN+/-SD	TIME 2 MEAN+/-SD	SIGNIF	LEVEL
FEM	2.0340+/-1.2135	2.0055+/-1.2434	0.5391	NS
MALE	2.0730+/-1.2190	2.1953+/-1.3018	0.0049	<1%
TOTAL	2.0552+/-1.2165	2.1093+/-1.2790	0.0887	<10%
SIGNIF	0.3842	0.0000		
LEVEL	NS	<1%	(A-II:	35,43,87,95)

Table 5.2 shows that the number of words per tone unit is not significantly different between groups for Time 1, while at Time 2, the male group has significantly increased its production. Important, however, is to note that the mean number of words per tone unit is centred around 2, with a relatively large standard deviation, implying

TABLE 5.3

NUMBER OF SYLLABLES PER TONE UNIT

WITH DIFFERENCES RELATED TO SEX AND TIME

	TIME 1	TIME2	SIGNIF	LEVEL
	MEAN+/- SD	MEAN+/- SD		
FEM	2.6972+/ -1.7437	2.7300+/ -1.8499	0.6296	NS
MALE	2.8788+/ -1.8952	2.9392+/ -1.9541	0.3622	NS
TOTAL	2.7960+/ -1.8296	2.8444+/ -1.9101	0.3097	NS
SIGNIF	0.0070	0.0020		
LEVEL	<1%	<1%		

(A-II: 36,44,80,88,95)

that the number of words has varied considerably from tone unit to tone unit. A small number of words per tone unit seem, therefore, to be one of the characteristics of the population under study.

The number of syllables per tone unit, Table 5.3, is an indication of the actual length of the tone unit, or in other words, of the amount of information the speaker is able to produce in one tone unit. See section 6.3.1 for a further discussion on this point.

The values found for both female and male groups tend to count around 3 syllables per tone unit, with a large standard deviation, therefore pointing to a fairly large spread of the actual values. Here, again, one can find significant differences between groups for Time 1 and for Time 2, to the advantage of the male group. In general terms, it can be seen that the population, as a whole, demonstrates little speed at Time 1, with no apparent improvement in Time 2.

TABLE 5.4

NUMBER OF SYLLABLES PER WORD

ACCORDING TO SEX AND TIME

	TIME 1	*TIME 2*
FEM	1.3260	1.3612
MALE	1.3887	1.3388
TOTAL	1.3604	1.3485

The ratio between the mean values in Table 5.3 and in Table 5.2 provides the figures below, Table 5.4, pointing to around 1.3 syllables per word. This means that, among the words produced by this population, a large proportion is monosyllabic.

The notion that a large proportion of words are monosyllabic is reinforced by the frequency values for *number of words per tone unit* (A-II,2) and for *number of syllables per tone unit* (A-II,3), yielding respectively 41.9% for one-word tone units and 29.4% for one-syllable tone units. The number of syllables for each word individually was not measured. Consequently, it is not possible to present a precise distribution spectrum of syllables per word, since this research was focused on the *tone unit* and not on the *word*.

The overall picture obtained from the observation of the variables *number of tone units*, *number of words per tone unit*, and *number of syllables per tone unit* analysed by *time* and *sex* strongly indicates that, on the average, an increase in the amount of discourse took place between Time 1 and Time 2. This is indicated by the larger number of tone units in Time 2, paralleled by a larger number of words and of syllables per tone unit. The performance of the female group may seem less impressive because the number of words decreased in Time 2. However, the computation of number of tone units and number of syllables per tone unit shows that the net result was an increase in the total amount of discourse for the female group in Time 2. A further discussion of these aspects is offered in Section 6.3.1.

5.3.2 Discourse Features Affecting Rhythm

Table 5.5 presents an overall view of the frequency distribution of the features affecting rhythm, such as hesitation (ER), wrongly placed word stress (WPWS), number of prominences (PROM), wrongly placed prominent syllables (WPPS), and wrongly placed tonic syllables (WPTS). There is a reasonably low

frequency for ER (8.6) and for WPWS (6.3). The distribution of PROM is consistent with a population that, as seen earlier (Section 5.3.1.), is not very fluent and uses a high proportion of monosyllabic words. On the other hand, a relatively high frequency of WPPS (31.0) and of WPTS (23.5) raises the possibility of examining differences related to time and to sex. On the average, 33.3% (33.2%+0.1%=33.3%) of the prominences are misplaced.

TABLE 5.5

FEATURES AFFECTING RHYTHM
ALL SUBJECTS, TIME 1 AND TIME 2 COMBINED

FREQ	ER	WPWS	PROM	WPPS	WPTS
NO 0	91.4	93.6		66.7	76.5
YES 1	8.6	6.3	61.7	33.2	23.5
2			32.5	0.1	
3			5.4	0.0	
4			0.4		

all values in %   (A-II: 3b,4a,b,c,6,b)

No significant difference was found for hesitation values between the first and second interviews (Table 5.6). However, between the female and the male group, the difference is significant at the <5% level, taking Time 1 and Time 2 together. The comparison of hesitation data, regardless of time and sex (A-II, 23,24), yields a highly significant difference (significance 0.00138, level <1%) between subjects.

TABLE 5.6

FEATURES AFFECTING RHYTHM

HESITATION – *ER* WITH DIFFERENCES RELATED TO SEX AND TIME

Time/ Sex	Hesitation %	SIGNIF	LEVEL
Time 1			
Fem	9.4		
Male	8.4	.32679	NS
Time 2			
Fem	9.5		
Male	7.5	.06021	<10%
Time 1 and			
Time 2			
Fem	9.4		
Male	7.9	.04208	<5%
Time 1			
Fem and Male	8.9		
Time 2			
Fem and Male	8.4	.55285	NS

(A-II: 21,22; A-III: 42,43)

This fact reinforces the notion that the differences found, concerning the variables *time* and *sex*, are due to a general trend of the sample, regardless of the individual behaviour of its parts. The influence of hesitation on rhythm is discussed in 6.3.2.

TABLE 5.7

FEATURES AFFECTING RHYTHM

WRONGLY PLACED WORD STRESSES PER TONE UNIT

WITH DIFFERENCES RELATED TO SEX AND TIME

	TIME 1 MEAN+/-SD	TIME 2 MEAN+/-SD	SIGNIF	LEVEL
FEM	0.0583+/- 0.2379	0.0650+/- 0.2496	0.4871	NS
MALE	0.0717+/- 0.2608	0.0610+/- 0.2394	0.2362	NS
TOTAL	0.0656+/- 0.2506	0.0628+/- 0.2441	0.6778	NS
SIGNIF	0.1688	0.6562		
LEVEL	<20%	NS		

(A-II: 29,37,45,81,89,97)

The mean values for the variable, WPWS, table 5.7, are affected by very large standard deviations, therefore decreasing the significance of the differences between one mean and the other. Hence, no significant difference is found between Time 1 and Time 2. A small level of significance (<20%) is found for the difference between the female and the male group for Time 2; thus, it is possible to say that WPWS is not affected by time or sex in the circumstances of the population under study.

As to prominences per tone unit (Table 5.8), no significant difference can be found for the Fem group in relation to time, indicating that they exhibit a consistent pattern referring to the number of prominences per tone unit.

TABLE 5.8

FEATURES AFFECTING RHYTHM

NUMBER OF PROMINENCES PER TONE UNIT

WITH DIFFERENCES RELATED TO SEX AND TIME

	TIME 1 MEAN+/-SD	TIME 2 MEAN+/-SD	SIGNIF	LEVEL
FEM	1.4466+/-0.6195	1.4586+/-0.6283	0.6262	NS
MALE	1.4234+/-0.6058	1.4518+/-0.6061	0.1973	<20%
TOTAL	1.4341+/-0.6121	1.4549+/-0.6163	0.2042	>20%
SIGNIF	0.3299	0.7626		
LEVEL	NS	NS		

(A-II: 32,40,48,84,92,100)

The male group, on the other hand, has increased the number of prominences per tone unit and the difference between the means for Time 1 and Time 2 is significant to the level of <20%. The male group, therefore, affects the

result of the whole population by bringing the level of significance between differences for Time 1 and Time 2 to just over 20%.

Regarding *sex*, the difference between the means for the groups Fem and Male is non-significant for variables Time 1 and Time 2.

TABLE 5.9

FEATURES AFFECTING RHYTHM

WRONGLY PLACED PROMINENT SYLLABLES PER TONE UNIT

WITH DIFFERENCES RELATED TO SEX AND TIME

	TIME 1	*TIME 2*	SIGNIF	LEVEL
	MEAN+/-SD	MEAN+/-SD		
FEM	0.3662+/- 0.5353	0.3789+/- 0.5536	0.5551	NS
MALE	0.3475+/- 0.5224	0.3379+/- 0.5074	0.6076	NS
TOTAL	0.3561+/- 0.5283	0.3566+/- 0.5293	0.9678	NS
SIGNIF	0.3641	0.0358		
LEVEL	NS	<5%	(A-II 0,38,46,	82,90,98)

Very large standard deviations do not allow for any significant differences between groups in Time 1 as far as the variable **wrongly placed prominent syllables per tone unit** is concerned (Table 5.9). At Time 2, a significant difference appears between the female and the male group, at the level of 5%. It means that the female group worsened their performance, while the male group

had it improved; thus, with a larger interval between the means, the difference became significant.

The female group increased the number of *WPTS* per tone unit (Table 5.10) between Time 1 and Time 2, and the difference between the means is significant at the level of <1%. The increase that is observed in the male group is, however, NS (not significant). The difference between the means for the FEM and MALE groups in Time 1 is significant at the level of <1%, while for Time 2 the difference is also significant, but at <5% level. On the whole, the two groups had their performance worsened as far as this variable is concerned.

A high proportion, 23.5% – table 5.5, of the discourse presents wrongly placed tonic syllables, which may cause frequent misunderstandings. The increase of the occurrence of this error detected in Time 2, Table 5.10, may perhaps be ascribed to an increase in fluency together with the use of polysyllabic words. The difference between groups is significant, very high in Time 1, level <1%, and smaller in Time 2, level <5%, indicating that the female group produced fewer wrongly placed tonic syllables than their male counterparts. In addition, one should note the increase in the number of wrongly placed tonic syllables for both groups, highly significant for the female group in Time 1 and Time 2.

5.3.3 Features Related to Intonation

The study of intonation includes *prominence*, *tone*, *key* and *termination*. Results belonging to the variable *prominence* were presented in Section 5.3.1

(Discourse Features Affecting Speed). Tables referring to the other variables are given and discussed below.

TABLE 5.10

FEATURES AFFECTING RHYTHM

WRONGLY PLACED TONIC SYLLABLE PER TONE UNIT

WITH DIFFERENCES RELATED TO SEX AND TIME

	TIME 1	TIME 2	SIGNIF	LEVEL
	MEAN+/-SD	MEAN+/-SD		
FEM	0.1864+/- 0.3917	0.2304+/- 0.4213	0.0062	<1%
MALE	0.2514+/- 0.4340	0.2620+/- 0.4413	0.5056	NS
TOTAL	0.2216+/- 0.4163	0.2476+/- 0.4324	0.0221	<5%
SIGNIF	0.0001	0.0479		
LEVEL	<1%	<5%		

(A-II: 4c,31,39,47,83,91,99)

5.3.3.1 Tone Profile and Choice of Tone

The results for tone profile and choice of tone are given in Tables 5.11 and 5.12, respectively. The following comments were drawn from the observation of Table 5.11 – Tone Profile according to Sex and Time

The frequencies of *r+* and of *o* tones, as well as the production of incomplete tone units are the main factors to be considered here. They account for the difference, highly significant, between the groups, as to the variables *Sex*

and *Time* – *r+* tones decreased in the female group while *o* tones increased in both groups.

Compared to the male group (see A-II,8), the female group produced a higher percentage (42.3%) of *p* tones, and *r+* tones (9.3% vs.7.1%). The percentages of their *o* tones and *incomplete* tone units are lower than those corresponding to the male group (37.7% vs. 39.7% and 8.6% vs. 9.9%).

The tone profile of the population, see Table 5.11, differs significantly (level <1%) between the first and second interviewsNote that *r* tones are absent in the population under study and that *o* tones are produced in a very high proportion (38.8%). Incomplete tone units account for about one tenth (9.39%) of the full number, 6191, of tone units. A further discussion of the tone profile and its comparison to a British tone profile is provided in section 6.3.2 of the following chapter.

When considered individually, subjects show that, as to tone profile (see A-II: 10,11), they differ from one another in a highly significant way – level <1%. This fact reinforces the importance of differences observed between the first and the second interviews as well as between the female and the male groups, indicating that these differences must be due to a well-defined trend. In other words, these individuals, while having an independent behaviour, show that some tendencies in the group are consistent with either the variation in time or the variation in sex. So, taking for instance variable *I*, incomplete tone unit, it is easy to see how the female group has a dominance over the male group, in both Time 1 and Time 2, while, at the same time, having followed the tendency of both the

TABLE 5.11

TONE PROFILE

ACCORDING TO SEX AND TIME

TIME/ SEX	p	p+	r+	o	I	SIGNIF and LEVEL
TIME 1						
FEM	44,5	0.3	11.6	33,6	10.0	.00003
MALE	42.6	0.1	7.4	38.8	11.2	<1%
TIME 2						
FEM	42,2	0.0	7.2	43,4	7.2	.42212
MALE	42,5	0.1	6.8	41.9	8.7	NS
TIME 1 and TIME 2						
FEM	43.3	0.1	9.3	38.7	8.6	.00315
MALE	42,5	0.1	7.1	40,4	9.9	<1%
TIME 1						
FEM and MALE	43,4	0.2	9.3	36,1	10.7	
TIME 2						.00000
FEM and MALE	42,3	0.1	7.0	42,5	8.0	<1%

(A-II: 5a,8,9; A-III: 34,35)

female and the male group (Fem and Male) of reducing the frequency of *I* with time. Now, turning to another variable, *o* tone, one can see that both groups have

increased the number of *o* tones between Time 1 and Time 2. Note, however, that the increase in the female group is larger than that in the male group. If an unconscious error-avoiding strategy is admitted, this is being used mostly to the advantage of the discourse comprehensibility of the female group.

Further to establishing a tone profile, an evaluation of the choice of tone was made. For each tone unit, the choice of tone was classified as either **unremarkable** or **odd**. The resulting analysis is shown in Table 5.12.

This table contains very important information regarding changes in the subjects' performance, considering that as a whole they presented a decrease of almost 4% (from 23.9% to 20.2%) in the variable **odd** for their choices of tone. The difference is significant at the <1% level. It is possible to say that, in respect to the increase in the number of proper choices of tone, the local native speakers may have influenced the population, as a whole.

Table 5.12 shows no difference in the level of significance for **sex** as far as the variable **odd** choice of tone is concerned. Nonetheless, over one-fifth (21.9%) of the tone units present odd choice of tone which may lead to misunderstanding in communication.

The difference between the first and second interviews is significant to the level of <1%. The proportion of odd choices of tone is smaller at the end of the six-month period considered, when the entire population is taken into account, that is, Fem and Male combined.

TABLE 5.12

CHOICE OF TONE

WITH DIFFERENCES RELATED TO SEX AND TIME

TIME/ SEX	ODD	UNREMARKABLE	SIGNIF	LEVEL
TIME 1				
FEM	24.1	75.9		
MALE	23.8	76.2	.88533	NS
TIME 2				
FEM	19.9	80.1		
MALE	20.3	79.7	.78303	NS
TIME 1				
and				
TIME 2				
combined				
FEM	21.9	78.1		
MALE	22.0	78.0	.93149	NS
TIME 1				
FEM and MALE	23.9	76.1		
combined				
TIME 2				
FEM and MALE	20.2	79.8	.00067	<1%
combined				

(A-II: 5b,12,13; A-III: 36,37)

5.3.3.2 Key and Termination

Some comments can be drawn from the results in Table 5.13 below. In the first place, the percentage of tone units with mid-key and mid-termination – **M-M** (70.0%) is outstandingly high. This indicates a monotonous discourse that may be ascribed to the lack of fluency of the subjects, in agreement with the findings in *Discourse features affecting speed* (5.3.1). This finding together with the high proportion of *odd* choices of tone – 21.9% (Table 5.12) and the predominating

components of the tone profile (*p* and *o* tones – Table 5.11) constitute a body of strange discourse characteristics. At the same time, the sum of the values corresponding to the selection of high key yields 17.6%. The native interlocutor may interpret such a high proportion of high key as a sign of aggressiveness and/or the wish to hold the floor. In any case, it is possible to conclude that the discourse of this population, as a whole, contains some strange ingredients that can easily lead to impaired comprehension and, indeed, singles out the speakers as not belonging to the native population.

The key and termination profiles of the female and of the male group are significantly different (level <1%). High key is predominant among males – 14.7% (fem) vs. 19.7% (male), considering the sum of H-H, H-M, and H-L values; M-M is predominant in the female group – 72.2% (fem) vs. 68.3% (male). Tentatively, one might think that the subjects belonging to the female group are more polite or less aggressive, or even, less imposing than their male counterparts.

The difference in the K and T profile between the first and the second interviews is very significant (level <1%), featuring an increase for H-H and H-M and a decrease for M-M, M-L and L-L.

As has been seen for other variables, the performance of individual subjects is completely independent of one another. Statistics shows that the difference between subjects is highly significant, giving a significance of 0.00000, which means no probability of similarity (A-II, 18,19).

TABLE 5.13

KEY AND TERMINATION PROFILE

WITH DIFFERENCES RELATED TO SEX AND TIME

KEY AND TERMINATION

TIME/ SEX	HH	HM	HL	MH	MM	ML	LL	SIGNIF	LEVEL
TIME 1									
FEM	7.3	5.8	0.3	2.3	73.2	7.1	3.9		
MALE	10.2	5.7	0.2	4.5	70.8	3.8	4.6	.00003	<1%
TIME 2									
FEM	9.2	7.1	0.2	3.8	71.2	5.5	3.0		
MALE	13.8	8.8	0.2	3.2	66.0	4.8	3.2	.00228	<1%
TIME 1 and TIME 2									
FEM	8.3	6.5	0.3	3.1	72.2	6.3	3.4		
MALE	12.1	7.4	0.2	3.8	68.3	4.3	3.9	.00000	<1%
TIME 1 FEM and MALE	8.9	5.9	0.3	3.5	71.9	5.4	4.3		
TIME 2 FEM and MALE	11.7	8.0	0.2	3.5	68.4	5.1	3.1	.00009	<1%

(A-II: 6,16,17,18,19; A-III: 38,40)

5.3.4 Results Reflecting the Individual Performance of Subjects

5.3.4.1 Discourse Features Affecting Speed

The numbers of words per tone unit and of syllables per tone unit are representative of the amount of information a speaker is able to put in a single spell of her/his discourse.

The number of tone units *per se* does not constitute an important feature, but it is the normalizing factor for all the important ratios under discussion in this chapter. This fact led to the organization of table 5.14 below in order to allow a visualization of the changes occurred for each subject between the recording of the first (Time 1) and the second interviews (Time 2). The similarities observed for the absolute differences in the case of informants 2 and 7, and 3 and 8 are of no value when their percentages are taken into account. As seen in table 5.1 (Number of Tone Units per Subject), in terms of performance per group, female or male, or in terms of the time of exposure of the subjects to the stimulus of a native English-speaking community, highly significant differences can be observed. Both groups presented an increase in the number of tone units per subject as a function of time (statistical analysis presented horizontally), while maintaining the difference between groups (statistical analysis presented vertically).

TABLE 5.14

NUMBER OF TONE UNITS RELATED TO SUBJECTS FROM 0 TO 9

TIME 1 and 2

SUBJECT	TIME 1	TIME 2
#	NRTU	NRTU
0	252	275
1	245	249
2	265	302
3	308	355
4	284	278
FEM	1354	1459
5	361	361
6	331	360
7	309	347
8	278	325
9	338	368
MALE	1617	1761
TOTAL	2971	3220

(A-II: 26)

Another parameter related to the performance of the informants refers to the number of words produced per tone unit. Table 5.15, below, offers the individual

performance of the informants at Time 1 and at Time 2. Large standard deviations indicate the variability of this parameter for each individual. The individuality of the performance at both times is emphasized by the high level of significance of the differences between individuals.

TABLE 5.15

NUMBER OF WORDS PER TONE UNIT

WITH DIFFERENCES RELATED TO SUBJECTS FROM 0 TO 9

TIME 1 and 2

SUBJECT #	*TIME 1* WORD/TU MEAN+/-SD	*TIME 2* WORD/TU MEAN+/-SD
0	2.1667+/-1.2858	2.1418+/-1.3447
1	2.1469+/-1.4239	1.8554+/-1.2649
2	1.7434+/-1.0272	1.7220+/-0.9768
3	2.0260+/-1.9826	1.9493+/-1.1609
4	2.0986+/-1.2084	2.4065+/-1.3610
FEM	2.0340+/-1.2135	2.0055+/-1.2434
5	2.2687+/-1.3488	2.4404+/-1.5501
6	2.0665+/-1.1916	2.0889+/-1.2255
7	2.1294+/-1.2390	2.3314+/-1.3222
8	2.0432+/-1.2069	2.0215+/-1.1478
9	1.8432+/-1.0460	2.0842+/-1.1677
MALE	2.0730+/-1.2190	2.1953+/-1.3018
TOTAL	2.0552+/-1.2165	2.1093+/-1.2790
SIGNIF	0.0000	0.0000
LEVEL	<1%	<1%

(A-II: 27.65)

Tables 5.15 and 5.16 underline the variability of the performance from subject to subject, a point made repetitively in this study. On the other hand, any changes detected depend on the collective behaviour of the sample or on its individual components. The difference found between the subjects of both groups, female and male, both for Time 1 and for Time 2, is highly significant and brings out their individuality.

TABLE 5.16

SYLLABLES PER TONE UNIT

WITH DIFFERENCES RELATED TO SUBJECTS FROM 0 TO 9

TIME 1 and 2

SUBJECT	*SYLL/TU*	*SYLL/TU*
#	MEAN+/-SD	MEAN+/-SD
0	2.9524+/-1.9531	2.8400+/-2.0244
1	2.6245+/-1.8078	2.6867+/-1.9568
2	2.4491+/-1.5220	2.3510+/-1.4995
3	2.5779+/-1.6275	2.5915+/-1.7188
4	2.8944+/-1.7682	3.2482+/-1.9616
FEM	2.6972+/-1.7437	2.7300+/-1.8499
5	3.2216+/-2.2350	3.3906+/-2.4094
6	2.6767+/-1.8244	2.6278+/-1.7281
7	2.9838+/-1.9026	3.2392+/-2.0366
8	2.8849+/-1.7968	2.8031+/-1.8014
9	2.6095+/-1.5546	2.6386+/-1.5598
MALE	2.8788+/-1.8952	2.9392+/-1.9541
TOTAL	2.7960+/-1.8296	2.8444+/-1.9101
SIGNIF	0.0000	0.0000
LEVEL	<1%	<1%

(A-II: 28,67)

As seen in Tables 5.2 and 5.3, above, the female group tends to repeat its performance in Time 2, while the male group, having increased its performance in terms of number of words, shows no significant difference in number of syllables between Time 1 and Time 2.

Syllables per tone unit is a variable that runs in parallel with *words per tone unit*. The individuality of the performance of the subjects, as observed for words per tone unit in Table 5.15, is confirmed in the table above.

This chapter has presented the summary tables and a preliminary discussion of the numerical results obtained by analysing 6.191 tone units selected from formal discourse produced by ten Brazilian post-graduate students on the occasion of their arrival in the UK and six months later. It reflects their linguistic behaviour as captured on these two occasions under the techniques and criteria used in this work.

A discussion of these results in the context of the literature available is presented in the following chapter.

CHAPTER 6

DISCUSSION

6.1   Introduction

The experience gained in a preliminary research project (Garcia, 1991a) led to the formulation of the working hypothesis for the current work. In that paper it was found that the native English speaker ranks the comprehensibility of the Brazilian speaker according to her/his inability to produce a discourse free of inserted vowels, wrongly placed tonic syllables, repeated words and wrongly placed prominences. These factors are related to the rhythm and the intonation of the discourse. For that study, the subjects were recruited from among the Brazilian postgraduate students at the University of Birmingham, regardless of age, sex or field of study, provided they had not had previous experience in an English speaking country and were not devoted to linguistic studies. No attempt was made at determining the time they had been in the country. Therefore, the study reflected the cross-section of the discourse abilities of the group at the time of the recordings.

For the present study, it was assumed that Brazilian students, although competent in the language as measured by the standards of British Council examiners, may no doubt have, upon arrival, some difficulties regarding the prosodic features of their discourse. The other assumption, actually the working hypothesis, was that these students, when immersed in the country's

environment, would suffer some degree of influence that could modify these prosodic features to some extent, possibly in the direction of their improvement.

6.2 English as an International Language (EIL)

The ongoing discussion on the role of English as an international language (EIL), has a direct bearing on the objectives of the present work, especially in respect to intonation. The number of persons in the world, according to Strevens, as mentioned by Morley (1993:311)

> who use English for some purpose range between 750 million and a billion and a half. But, and of special interest to us, only approximately 300 million of them are native speakers (NSs), leaving a staggering number of nonnative speakers (NNSs).

Until recently, the aim in pronunciation teaching was to try to make the learners become aware of, and to develop, the skills of speaking English with an almost unnoticeable foreign accent. The objective was to establish a flawless communication between non-native speakers (NNSs) and native speakers (NSs) of English. The present work was conceived within this framework.

A very important change is taking place at present. The emphasis is being displaced from that objective towards the definition of acceptable standards of communication among NNSs, therefore reinforcing the importance of English as a world *lingua franca*.

The role of pronunciation within this new perspective is being discussed. A less rigid approach to pronunciation is being proposed. It considers the existence of the many recognized NSs' accents and, at the same time, accepts as legitimate the local accents of true bilinguals. It may seem an exaggeration but, within this

context, even the non-existence of NSs of English is being admitted. This new view comes in favour of the recognition of the dominating role of English as the international *lingua franca*.

The first recorded outburst of this new attitude is given by Brazil (1994:1-2). He strongly opposes 'the perfectionist tradition which demands native-speaker like control of the sounds of a particular accent, and which regards everything else as an "error".' According to him, pronunciation should be seen 'from the point of view of how it can best enable them (the learners) to make their meanings and intentions clear to a listener'. This is in the line with Morley (idem:317) who stresses the importance of training NNS speakers 'to become effective, fully participating members of the English-speaking community' and gives notice of the 'persistent, if small, groundswell of movement to write pronunciation back into the instructional equation but with a new look and a basic premise: *Intelligible pronunciation is an essential component of communicative competence.*'

Lee (1995:8-9) defines "native speakers of English" as 'people whose first language in life was English. But people may have more than one native language (...)' In relation to "non-native speakers", he states that

> They may speak English poorly or well. Those who speak it well don't generally speak it *exactly* the same way as any 'native' speaker. (...) Pronunciation is only one aspect of language use. (...) Learners need some acquaintance with several types of English if they are to spend much time in Britain or frequently move about the world, although they need to *use* only one familiar type. (...) 'Non-native' learners need not aim at becoming indistinguishable from 'native speakers'.

And, in his final statement on the occasion of the 1994 IATEFL Conference at Brighton, he says that: 'We should try to be charitable about other people's ways of using a language. If English is to be a flexible means of communication in the modern world, good will in all communicative acts is desirable.' (emphasis added)

The statements above are perhaps the first milestones on the road leading to the present concept of *good* or *acceptable* pronunciation. It is interesting to note the reaction caused by such views, particularly in England, as for example Shukla's writing (1995:28):

> Not wishing to contradict anything the author has to say on the subject, I would like to refer to an ever-growing population of young men and women who are condemned to be 'non-natives' in modern Britain. Yet the only 'non-native' thing about them is their name, skin colour or both. A great deal of effort will have to be made to disentangle cultural and racial factors from the purely linguistic ones. It would be a great pity if 'native' were always to remains (*sic*) synonymous with White Anglo-Saxon speakers.

I am obviously not addressing myself to the politico-socio-linguistic problems of modern England. Statements as the above have, however, to be taken into account in the attempt to determine their influence in the construction of a syllabus for the teaching of pronunciation in EFL, as will be considered in the next chapter.

The argument on NS, NNS and EFL proceeds with Jenkins (1996:10-11) while quoting Sridhar (1996), who says that

> The traditional prototype paradigm of second language teaching, which assumed that a non-native learner learned English in order to communicate with a native speaker of English no longer represents the primary context of the use of English in the world today.

This statement is followed by Jenkins' view bringing up the idea of the existence, nowadays, of

> (...) two categories of English: first, that used intranationally, whether in the 'core' countries (Britain, the USA, Australasia) or as an official language in the 'ESL' countries such as India; and second, that used anywhere in the world, between speakers from countries for whom English does not have intranational functions.

And she continues by presenting her ideas towards a change in pedagogic goals, 'particularly in the field of pronunciation'. She argues against such terms as 'native speaker', 'non-native speaker' and 'English as a foreign language'. Instead of 'native speaker', Jenkins proposes 'MSE', Monolingual Speaker of English, which refers to those L1 speakers of English who speak no other language fluently. As to pronunciation, it is her opinion that

> L1 standards would remain operable here, but not to be used to measure other varieties of English. Eg. just because L1 speakers use weak forms, this does not mean that speakers of other varieties should be criticised or even penalised for not doing so, since these do not appear to contribute to international intelligibility. . . Instead of "NS", for those L1 speakers of English who speak (an)other language(s) fluently AND instead of "NNS" for fluent L2 speakers of English

Jenkins suggests BSE, – or Bilingual Speaker of English. for those who are not fluent, or who speak English as a second or a foreign language, she suggests NBSE – Non-Bilingual Speaker of English. In my opinion, the adoption of this classification would not only place the English speaker, native or otherwise, in an international perspective but it would also help dispel the discrimination that non-native English teachers, although qualified, suffer when applying for teaching posts in the U.K. or in other countries.

More recently, the same author (Jenkins, 1998a:119), still probing the concept of English as a *lingua franca* (ELF), argues that features such as word stress and pitch movement are irrelevant for the intelligibility among non-native speakers, 'so they are only useful if learners intend to communicate with native speakers of English'.

From the West side of the Atlantic, Morley (ibid.:324) among a number of pedagogical principles regarding the teaching of pronunciation, puts emphasis on

> the uniqueness of each ESL learner. Each has created his or her own personal pattern of spoken English, which is unlike that of anyone else and the product of influences from both the L1 and the L2, the student's personal learning and communicability strategies, as well as the impact of input and instruction. (...) This unique pattern now needs to be modified in some way(s) in order to reach goals of intelligibility, communicability, and self-confidence.

In a paper entitled *Which pronunciation norms and models for English as an International Language?*, Jenkins (1998b:42) expands her argument on EIL:

> We no longer regard English as being taught mainly for communication with its native speakers (the goal of EFL) or the target of pronunciation teaching as a native-like accent, with the eradication of all traces of a "foreign" accent, however unrealistic that target always was. We acknowledge that the EFL-ESL distinction is beginning to blur as the two merge into English as an International Language (EIL).

The arguments above bring an entirely new focus on the work presented here. It was originally conceived, as said before, as an attempt to determine whether a population of Brazilian post-graduate students, rating between BSEs and NBSEs in Jenkins' proposed classification, suffer the influence of the academic environment in the UK and are able to improve the prosodic features of

their English. It is now being said that such an improvement is actually irrelevant in what concerns the students' ability to communicate with other NNSs and that only if they were to communicate with NSs would it become important.

In view of the above, in the Southern Hemisphere, particularly in this country, Brazil, as part of the world community that are largely users of EIL, 'the most widespread language in the world, <u>but one with no native speakers'</u> (emphasis added) (Morrow, 1998:99), the effort that is being proposed below, towards raising the importance of pronunciation in the ELT curriculum, seems to lose momentum.

On the other hand, when it is necessary to communicate with native speakers in their own language, by experience, I know how important it is to be able to minimize the disadvantage of being a NNS, even when rated among BSEs. I therefore consider that the arguments of the above mentioned authors apply only North-Southward, and not South-Northward, and I maintain that it is important to improve the curriculum of EFL in what concerns phonology, especially intonation. Consequently, NS teachers of the new vogue that are not willing to spend their time teaching a high standard of pronunciation should be strongly repelled in our EFL teaching system. Their argument that "Brazilian English" is a legitimate brand of EIL is not consistent with the considerable disadvantage that Brazilians or, for that matter, nationals of any other non-English-speaking countries – EIL speakers – have, due to their pronunciation, when in contact with learned societies, institutions or the academia in the "core" English-speaking countries.

I am afraid that, if the less rigid attitude is to persist, we may, in no too long time, come to the development of local pidgin EILs, soon leading to the need of translation procedures to convert one local EIL brand into another, and that these brands will in themselves be ununderstandable to native speakers ...

6.3   Influence of the Environment

The English language teaching (ELT) literature is rich in studies and research papers that have examined the problems of the teaching of English as a second language; the International Association of Teachers of English as a Foreign Language (IATEFL) has been in existence for a number of years and has provided a powerful forum for such discussions; and yet, until Roach (1983), no particular importance had been paid to the effects of adaptation to the environment as a form of learning and, therefore, improving one's prosody.

The results of an attempt to measure, in a systematic way, the effect of the immersion of Brazilian post-graduate students in a native English-speaking environment are offered here as a contribution to the subject. A number of variables aiming at determining the effect of time on the behaviour of the population under study regarding speed, rhythm and intonation were chosen.

6.3.1 Influence on Speed

It can be said now that after six months in England, the students presented an increase in the amount of discourse produced per unit time. The data represented in tables 5.1, 5.2, 5.3, and 5.4 give unequivocal testimony to this statement. Looking at the set of variables related to speed – number of tone units per subject, number of words per tone unit and number of syllables per tone unit

– one can see that the output of information of the group increased from Time 1 to Time 2 in the five minute stretches of discourse analysed.

A definition of the criteria used in order to support the statement above is in order now. The number of tone units in the five minute stretches, alone, is not sufficient, since the number of words per tone unit and the number of syllables per tone unit may change from individual to individual, from tone unit to tone unit.

The number of words per tone unit is an indication of the amount of information an individual is able to compress in a tone unit.

The number of syllables per tone unit is an expression of the complexity of the words utilized by the informant.

If the number of tone units increases and the number of words hardly changes while the number of syllables does not change, the increase in tone units related to these other two variables is a sure indication of the increase in the amount of discourse contained in a particular stretch analysed, and therefore, an indication of the increase in speed.

In the case of the population under study, while the female group had a smaller output in terms of number of tone units than their male counterparts, both groups increased their performance from Time 1 to Time 2. The respective differences were highly significant.

In terms of number of words per tone unit, considering Time 1 and Time 2, there is no difference for the female group and a small though significant increase for the male group. This increase lends a high significance to the otherwise small

difference between both groups in Time 2 (Table 5.2). This means that the female group, having increased the number of tone units and not having increased the number of words per tone unit from Time 1 to Time 2, actually improved the amount of information produced in the five-minute stretch of discourse analysed.

Now, concerning the male group, their improvement is important in two ways, since they have increased not only the number of tone units but also the number of words per tone unit.

The number of syllables per tone unit did not vary significantly from Time 1 to Time 2 for both groups. However, between groups the difference is highly significant and again is in favour of the male group.

All three variables considered, both groups, and hence, the population under study, presented an increase in the output of their discourse in relation to the five-minute stretches considered, from Time 1 to Time 2.

In conclusion, it is possible to say that speed is positively affected by her/his immersion in an English-speaking environment, and that this effect can be detected at six months' time.

Commenting on the speed of speech, Crystal (1995:115) estimates it at 200 syll/min for the reading of BBC News, 300 syll/min in a radio discussion and, in informal conversation, an average of 400 syll/min, with some fragments of utterances reaching peaks of 500 syll/min. In formal discourse, as described in Section 3.2.2, however, the performance of the population under study is far below that of native speakers. Taking into account and combining the results in Tables 5.1 and 5.3, one can arrive at 100 syllables per minute (syll/min) for

females at Time 1, and 107 syll/min at Time 2, while males produced 111 syll/min at Time 1 and 120 syll/min at Time 2. The differences between sexes and between Time 1 and Time 2 in Table 5.1 are highly significant.

A cautionary word has to be inserted here and it refers to a comment by Crystal (1975:15) on the relation between speed and the number of tone units in an utterance. I said before, section 2.4, that an adverse effect for comprehension could exist due to the presence of an abnormally high number of tone units in a certain stretch of time. In the case of the Brazilian informants, one has to bear in mind that the increase in the number of tone units from Time 1 to Time 2 is accompanied by a significant increase of syllables per minute, therefore representing a true increase of the amount of discourse per unit time. In favour of this interpretation comes the fact that, even so, there is plenty of room for improvement when the Brazilian group, averaging between 100 and 120 syll/min, is compared to the 200 to 500 syll/min range that native speakers can reach.

6.3.2 Influence on Rhythm

Rhythm is recognized as a very difficult feature for learners of English to perceive and to acquire. It is particularly true for learners whose L1 is syllable-timed, such as French and Spanish, and for Brazilians, especially those speaking the *fronteiriço*, a dialect of Brazilian-Portuguese, used by the people living along the borders with Uruguay and Argentina.

> While English is relatively stress-timed, with stresses occurring on important syllables in the speech stream at roughly equal intervals, most of the world's languages tend towards varying degrees of syllable-timing. (...) In fact, rigid stress-timing is no more than a convenient fiction for classroom practice...(Jenkins, 1998a:123).

According to Vanderplank's (1993:120-1) report on a classroom experience,

> For almost all learners, the notion of isochrony was novel and they felt it filled an important gap in their understanding of stress and rhythm in English. Learners ranged from German and Danish speakers with few problems of stress, rhythm or understanding in English, to French speakers who had all the usual problems associated with those whose mother tongue is syllable-timed trying to learn a stress-timed language.

My previous teaching experience (Garcia, 1983) confirms Vanderplank's observations. Errors due to wrongly placed word stress and wrongly placed prominent syllables occur with a very high frequency and are very difficult to correct by means of the audio-oral method, indicating the lack of the notion of isochrony.

It is very interesting to take note of a certain degree of difficulty that present-day authors, such as those mentioned above, have when they attempt to classify English according to rhythm. For many years, stress-timing was considered to be the characteristic rhythm of English, as opposed to other well defined syllable-timed languages, such as French. If a change is actually taking place, or if, on the other hand, the study of suprasegmentals is leading to the identification and recognition of previously unsuspected nuances in the rhythm due to regional influences, only research can determine.

A very similar situation can be found in Brazil, where regional dialects are recognized mainly because of their segmental components, especially in the way consonants are pronounced. Only recently, has some attention been devoted to

the suprasegmentals of Brazilian Portuguese, but, as yet, no consensus has been reached.

I should like to stress that the study involving the rhythm of Brazilian Portuguese, like the study of the rhythm of English, constitutes a very broad and large untapped source of research topics.

I shall now examine the influence observed on the different variables that affect rhythm, e.g., hesitation, wrongly placed word stress, number of prominences, wrongly placed prominent syllables and wrongly placed tonic syllables.

Table 5.5 allows a comparison of the features mentioned above. Regarding rhythm, it is easy to distinguish two features that exert little influence on the performance of the whole group. The two features are *Hesitation* (ER) and *Wrongly placed word stress* (WPWS). The data on *Prominences* (PROM) refer to the proportion of prominences per tone unit. These data are in agreement with the finding that most tone units consist of two words, mostly monosyllabic words. The other two features in Table 5.5 are *Wrongly placed prominent syllable* (WPPS) and *Wrongly placed tonic syllable* (WPTS), which represent, respectively, an incidence of 33.2 and 23.5%. For WPPS, this incidence means that one third of the tone units produced by the informants have the prominence in the wrong syllable. Concerning WPTS, almost one quarter of the tone units have the tonic syllable in the wrong place. It is easy to evaluate the disruption of the normal rhythm of the language caused by these two factors combined and the loss of the comprehensibility of this population's discourse for native speakers.

Hesitation as defined and measured in this work is considered by Hewings (1990:130) a feature that influences fluency. It should be made clear that only such hesitation signs considered by Hewings as 'filled pauses' (idem: 131), e.g. *ER* with a prominence, were taken into account. This variable did not suffer a significant change with time. In a preliminary research (Garcia 1991b), it was found that hesitation occupies a position of great relevance among the factors impairing comprehension. In the present study, apart from its persistence, the only difference found in performance was between sexes. Female informants are more hesitant than the male group. No differences ascribable to time could be detected (See Table 5.6 for the relevant data).

The occurrence of wrongly placed word stress (Table 5.7) is another feature that revealed itself immune to correction by immersion of the informants in the native speaking surrounding. The same is true for the number of prominences per tone unit (Table 5.8). In a previous study (Garcia, 1983), while evaluating a pronunciation teaching method – audio-oral, it was found that graduate students exhibited a considerable improvement in the occurrence of wrongly placed word stress after three weeks of instruction in class. This fact comes in support of the need to teach pronunciation from the onset of ELT with the conscious participation of the student. This type of deviation is difficult to be corrected by a simple immersion of the EFL speaker in the native speakers' environment, at least in a period of six months.

Although not specifically mentioned in Brazil's texts as features related to intonation, the measurement of wrongly placed word stress and wrongly placed tonic syllable was included in this study because of its obvious relation to this

suprasegmental. The inappropriate placement of stresses contributes to the misplacement of the tonic syllable. Actually, Cruttenden (1986:18-9) considers accented syllables to form 'the framework for intonation'. He finds that 'As a prerequisite for the description of intonation, we have to know which syllables are stressed in words (...); (...) which syllables are accented syllables in utterances'.

Considering the whole group, wrongly placed prominent syllables per tone unit is a feature that does not show a significant difference between the first and the second interviews. The only difference found was between sexes, the male group having presented a better performance than their female counterparts. However, this difference can hardly be ascribed to the effect of the English environment on the Brazilian male students (Table 5.9). The difference between sexes reappears when the placement of tonic syllables is considered. Here again, the performance of the male group is better than that of the female group. Surprisingly, as a whole, both groups had their performance worsened with time.

As a consequence of the above, factors affecting rhythm did not suffer a positive influence from the environment. The group has kept, when not worsened, their initial performance in six months' time, thereby rhythm remaining an important factor against comprehension of their discourse.

The factors discussed above influence the overall performance of the speaker and influence the comprehensibility of her/his speech, as mentioned before (Garcia, 1991a). In other words, fluency, defined as the ability 'to speak and to write a particular language competently and with ease' (Chambers Concise

Dictionary, as referred by Hedge, 1993:275) depends heavily on such factors. Taken in the opposite direction, Hedge (ibid.) defines: 'Non-fluency in an English language learner is discernible in frequent pauses, repetitions, and self-corrections...'.

The inevitable conclusion is that the population under study was unable to overcome its difficulties in what concerns factors that exert influence on rhythm, such as wrongly placed prominent syllables and wrongly placed tonic syllables. This is in agreement with Pirt's report (1990:154) on discourse intonation problems for non-native speakers in which she says that such errors occur

> because the speaker is *saying* rather than *meaning* the words. It is not, therefore, a question of learning *how* to shift prominence from one word to another (what is unfortunately what most text books imply the learner is incapable of), for there is evidence that they can do that already (...). It would seem rather that the problem is *where* and *when* to make a word prominent.

From this comment, it is very easy to identify Pirt's alignment with Brazil's ideas about the spontaneous discourse sounding like oblique orientation. A similar comment can be found in Konder & Duarte (1989), which reads:

> The intonation distinctions between direct orientation and oblique orientation, however, are not restricted to reading. We should be concerned with the pedagogical implications for EFL teaching/learning not only as regards the learner's reading intonation but perhaps more importantly as regards their intonation in speaking – which will have oblique orientation as long as they concentrate on the language (grammatical structures and vocabulary) and they will consequently speak as if they were reading out.

The discourse of the group, in a period of six months in the U.K., is still and easily identifiable as belonging to that of a non-fluent English learner. There may not be an easy way to remedy this situation. The best form to overcome it is to

prevent it, engaging early learners in an active programme to develop pronunciation skills alongside with the learning of the lexis and the grammar of the English language. One such programme would have to involve the conscious learning capabilities of the subjects, drawing attention to L1 aspects that tend to affect the performance of the learner in the pronunciation of the foreign language. More on this subject can be found in the chapter on Intonation and the EFL Syllabus.

6.3.3 Tone Profile and Choice of Tone

I shall now examine the variables *tone, key* and *termination* whose domain is determined by prominence.

Table 5.11 provides the distribution of tones in the population of Brazilian students arranged according to sex and time. Such a distribution as discussed in Section 5.3.3.1 has shown a significant difference between Time 1 and Time 2, indicating a tendency to increase the proportion of *o* tones (36,1 to 42,5%), at the expense of *p* tones (43,4 to 42,3%), and of *r+* tones (9,3 to 7,0%). Incomplete tone units decreased from 10,7 to 8,0% in the six-month period.

The tone profile discussed above is of no value *per se*. It has to be compared to a suitable standard obtained with native informants, in order to observe: *a* – the differences between these and the Brazilian informants; and *b* – any changes resulting from their presence in England.

Crystal (1969:225), who recorded spontaneous speech in informal situation, made numerical data of the tone distribution for English native speakers

available. In the same section, he refers to data from Quirk et al. (1964) and from

Davy (1968), for conversation, as transcribed in the following table:

TABLE 6.1

TONE PROFILE FOR ENGLISH NATIVE SPEAKERS

Tone profile	$\searrow$	$\searrow$	$\vee\nearrow$	$\nearrow$	$\searrow+\nearrow \rightarrow$	$\nearrow+\searrow$
(in %)						
Crystal, 1969	51.2	5.2	8.5	20.8	7.7	4.9	1.7
Quirk et al., 1964	52.5	3.9	6.9	24.7	9.3	2.1	0.6
Davy, 1968	58.7	4.2	7.4	16.1	5.1	8.0	0.4

The data in Table 6.1 are not referred to the number of tone units or to the number of informants. In this case it is difficult to judge their corresponding significance. In general, they are in good agreement among themselves.

There is a difference between the system adopted in the present study (Brazil, 1985), which consists of five tones – *p, r, p+, r+, o,* and that of Crystal's (ibid.), which in addition has two compound tones: $\searrow+\nearrow$ and $\nearrow+\searrow$. These compound tones, when analysed under Brazil's system, generate each two tones, either *p=* $\searrow$ and *r+= $\nearrow$*, or *r+ = $\nearrow$* and *p=* $\searrow$, as follows:

TABLE 6.2

CONVERSION OF ENGLISH TONE PROFILE

Tone profile	↓	∿	↗	↑	↓+↑	→	↑+↓
British (in %, Crystal, 1969)	51.2	5.2	8.5	20.8	7.7	4.9	1.7
Brazil's System (Equivalent)	p	p^+	r	r^+	$p{+}r^+$	o	$r^+{+}p$

Rearranging Crystal's data according to Brazil's five-tone system, a new set of values is obtained, as shown below, thus allowing for the comparison with the data herein reported.

TABLE 6.3

ENGLISH TONE PROFILE IN BRAZIL'S SYSTEM

Tone profile	p	$p+$	r	$r+$	o
British (in %, adapted from Crystal, 1969)	55.4	4.7	7.8	27.6	4.5

Crystal's data are in disagreement with those of Brazil, Coulthard and Johns' (1980:13).

For these authors, the falling, ↘, and the falling-rising tones, ↘↗, 'are by far the most frequent' in their data, although no values are given. However reliable the source, the fact that Crystal's data had to undergo adaptation in order to be compared with my data indicates the regrettable lack of researched data for the native population in terms of Brazil's notation system. Nonetheless, the recording of other non-native groups for studies of some peculiarities of their intonation, although not on a quantitative or statistical basis, have been made by other authors and will be discussed below.

The data corresponding to the tone profile of the Brazilian group at Time 1 and Time 2, male and female combined, were taken from Table 5.11 in order to organize Table 6.4. This table, however, includes the variable *I* – incomplete tone unit.

TABLE 6.4

TONE PROFILE OF BRAZILIAN POST GRADUATE STUDENTS

INCLUDING INCOMPLETE TONE UNITS

(Data in %)

	p	*p+*	*r*	*r+*	*o*	*I*
Time 1	43.4	0.2	-.-	9.3	36.1	10.7
Time 2	42.3	0.1	-.-	7.0	42.5	8.0

It is important to note the decrease in the proportion of incomplete tone units, from Time 1 to Time 2. The exclusion of this variable provides a new set of data, thus allowing for a direct comparison with Crystal's adapted data, as in Table 6.5.

The tone pattern shown by the group of Brazilian students has peculiar features when compared to the data obtained for native speakers. The occurrence of *p* tones decreases a little from Time 1 to Time 2; *r* tones do not occur; *r+* tones decrease from Time 1 to Time 2; the proportion of *o* tones increases. The absence of *r* tones in the discourse of the Brazilian group can perhaps be explained by a sort of inhibition-transfer. Lieff & Nunes (1993:25) consider that 'The fall-rise may be difficult due to shyness or to the feeling that this is an "exaggerated" pitch change'.

TABLE 6.5

TONE PROFILE OF BRAZILIAN POST GRADUATE STUDENTS

COMPARED TO DATA OF ENGLISH NATIVE SPEAKERS

(EXCLUDING INCOMPLETE TONE UNITS)

(Data in %)

BRAZILIAN	*p*	*p+*	*r*	*r+*	*o*
Time 1	48.7	0.2	-.-	10.4	40.5
Time 2	46.0	0.1	-.-	7.6	46.2
BRITISH	55.4	4.7	7.8	27.6	4.5

First of all, it must be admitted that these data give no indication of a positive evolutive process towards a native speaker intonation pattern. Secondly, it may be possible that the Brazilian group was, instinctively, using an error-avoiding strategy whereby *o* tones were used instead of normally occurring *p*, *r* and *r+* tones. In fact, the sum of *r+* and *o* tones in the Brazilian group (46.2% + 7.6% = 53.8%) accounts for more than the sum of *p+*, *r*, *r+* and *o* tones in Crystal's data (4.7% + 7.8% +27.6% + 4.5% = 44.6%).

The complete absence of *r* tones and the use of *r+* tones, whenever referring tones are used, confers a dominant quality to the speaker's discourse, which may sound aggressive to native listeners. On the other hand, the excessive use of *o* tones denotes a discourse loaded with incomplete pieces of information, according to Mansfield (1990:79). In a study of Italian informants, she found that

o tones are followed by tone units with *p* tones to complete the information. Referring tones (*r* and *r+*) seem more difficult to be mastered by the Brazilian EFL speaker than *p* tones.

Pirt (1990:152), describing the tone profile of Italian EFL speakers in comparison to English native speakers, found 'more oblique tones in the non-native data,' though her material was obtained from "real-time discourse", not from reading. According to Pirt, while native speakers resort to *o* tones as a strategy to ' (a) on-the-spot verbal planning (...) and (b) simulated word searching for rhetorical effect', *o* tones in the non-native speakers' discourse can be interpreted 'as a non-communicative stance on the part of the speaker.' This coincides with the impression I have upon listening to the discourse of my informants, and is corroborated by the numerical data obtained.

Since *o* tones occur mainly in relation to function words, it is not surprising that non-native speakers, in their attempt to avoid intonation inadequacies, resort intensely to such tones in their discourse. *o* tones are non-committing and, therefore, non-native speakers may abuse of level intonation as part of their unconscious error-avoiding strategy.

TONE PROFILE

RELATIVE FREQUENCY %

TONES

Time 1 (F+M) Time 2 (F+M) BRITISH
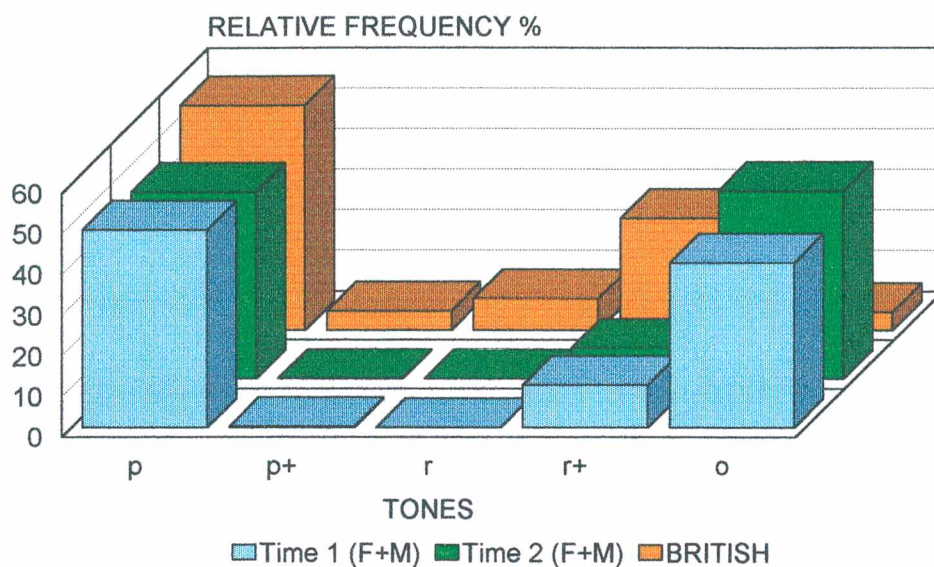
*Figure 6.1 – **Tone Profile** – The graph represents the tone profile of the combined female and male groups for Time 1 and Time 2 in comparison to the British profile adapted from Crystal's data (1969:225).*

Figure 6.1, above, gives a visible impression of the difference referring to the tone profile between the native speaker's population, according to Crystal, and the data that resulted from this research.

TABLE 6.6

TONE PROFILE ACCORDING TO SEX AND TIME

BRAZILIAN POST GRADUATE STUDENTS

(Data in %)

	TONE	*p*	*p+*	*r*	*r+*	*o*
FEM						
TIME 1		49.4	0.3	0.0	12.9	37.3
TIME 2		45.5	0.0	0.0	7.7	46.7
MALE						
TIME 1		48.0	0.1	0.0	8.3	43.7
TIME 2		46.5	0.1	0.0	7.4	46.9

In order to see if any differences between sexes would arise in the tone profile, Table 6.6 was organized. It is based upon Table 5.11, excluding the fractional contribution of the incomplete tone units.

Figure 6.2 corresponds to a visual representation of Table 6.6. Both serve to indicate that the female group uses the falling, *p* tone in a higher frequency than the male group in Time 1. In the second interview *p* and *r+* tones yield some of their proportion to *o* tones in the case of both sexes. The situation in Time 1, although not confirmed in Time 2, takes me back to Coates' comments (p16)

TONE PROFILE
according to sex and time
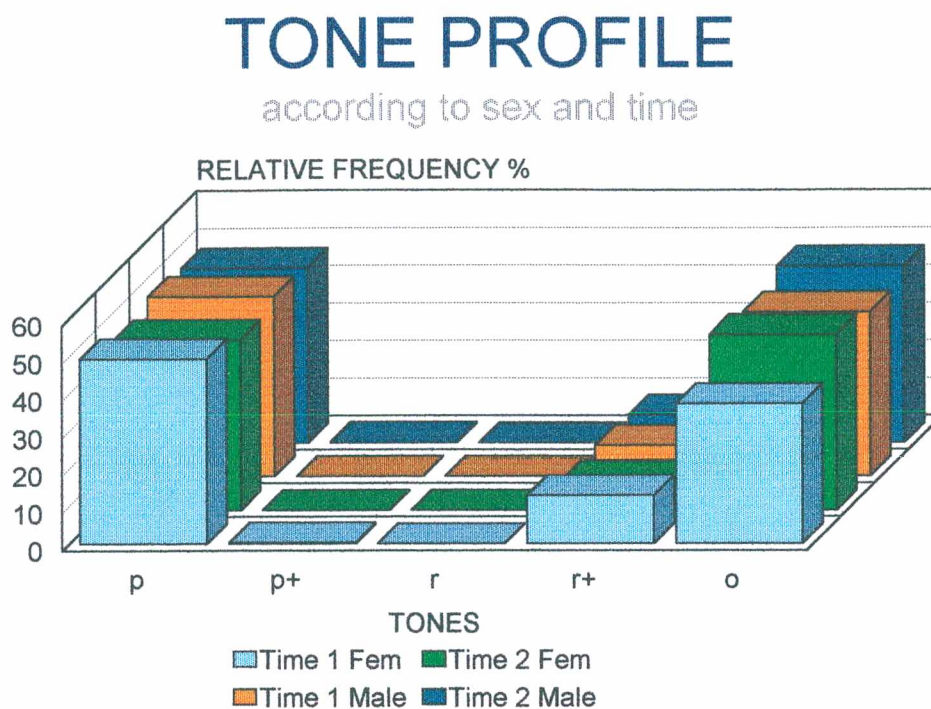
*Figure 6.2 – **Tone Profile according to sex and time** – The graph represents the tone profile of the female group and of the male group and the variation observed from Time 1 to Time 2.*

6.4 Key and Termination

Key and termination are topics of which the study has evolved lately, aiming at the confirmation of Brazil's statement on the regressive role of both, together with their relation to the choice of tone. In my study, apart from an evaluation of the frequency of key and termination choices, in the corpus, no attempt was made at the establishment of the relation of K and T of each tone unit to the neighbouring tone units. The possibility is still open for a future study.

The behaviour of the population under study showing an absolute predominance of mid choices for both features can only be explained in terms of

an error-avoiding strategy. It is interesting to bring to this discussion the pioneering work of Konder et al. (1988), which presents a H-M pattern for Portuguese spoken by a Brazilian teacher in class. If this could be extended somehow to the population-at-large, one would have to recognize that conversion to a predominant M-M pattern, when speaking English, denotes an abnormal production.

6.5   Concluding Remarks

In closing this discussion of the data obtained, I should like to draw attention to the importance of the analysis of a large number of tone units. This fact has ensured an insight of the real weight of the conclusions. The discussion is not based on the analysis of individual tone units or small stretches of discourse but rather on the tendencies exhibited by a well-defined population.

CHAPTER 7

INTONATION AND THE EFL SYLLABUS

7.1   A Discussion on Intonation as a Legitimate Part of the EFL Syllabus

Should intonation be part of a teaching-learning programme? How important do Brazilian EFL teachers regard intonation features to be, and how well are they prepared to include them in their regular classroom activities?

Learners of English should have the opportunity to become aware of the role of intonation and the problems that inappropriate intonation can cause. They need to develop their receptive skills, their ability to listen critically and to reach a stage in which they can hear the differences subconsciously, the way a native listener does. It seems strange that English intonation, which is the first feature of the spoken language to be acquired by an English infant, should be the last feature to be presented to foreign students of English. All the important segmental features have been well accounted for in text books for a proficiency scale ranging from beginner to advanced; however, any systematic study of intonation has traditionally been left to the well motivated, advanced learner. It is very true that 'at a time when communicative competence has emerged as a goal for the language learner, it would seem that the time is ripe for considering ways of integrating the teaching of intonation and other aspects of the sound system into the language syllabus' (Brazil et al., 1980:117). This statement is almost two decades old and yet it is very up-to-date and applicable to the present situation. More recently, Clennell (1997:117) points to the fact that at

the heart of many cross-cultural misunderstandings lie problems associated with intonation features of learner English. Failure to make use of the appropriate pragmatic discourse features of English intonation may result in serious communication breakdown between native and non-native speakers of even advanced levels of proficiency.

The problem can be summarized in the following *cliché* he transcribes: 'It's not <u>what</u> she says, but <u>how</u> she says it' (emphasis added).

One of the implications of the communicative language approach considers spoken rather than written data to be the model for any description of natural languages, and consequently for grammar. Speakers project assumptions as to the values of linguistic items or forms, and these assumptions are open to challenge and to negotiation in real interactive discourse. While native speakers allow for the mistakes of a foreigner in grammar, vocabulary and segmental pronunciation, mistakes in intonation are not accepted. According to Cruttenden (1994:231), 'while the variation in intonation between languages (...) is not as great as that involved in segments, it is nonetheless sufficient to cause a strong foreign accent and in some cases to lead to misunderstanding.'

Crystal and Davy (1975:8), in turn, say that native speakers 'assume that in this respect (in intonation) a person sounds as he means to sound'. This may explain why writers on intonation have often said that foreign learners of English need to learn English intonation. Some features do, in fact, interfere with comprehensibility of native speakers (Garcia, 1991b).

A model derived from written text does not account for the role of intonation choices in projecting the existential, here-and-now, lexical and syntactical relationships expressed by speakers. Language users exploit the range

and limits of the meaning potential through contrastive choice of the phonological features of intonation. It seems inadequate to attempt to formulate a model for a description of spoken language if the effects of intonation selections are not taken into account, because the component *intonation* brings meaning into being.

In a discussion on intonation rules in ELT textbooks, Cauldwell and Hewings (1996:327-34) criticize the two rules of intonation most commonly found in ELT textbooks. They refer to *intonation in lists* and to *intonation in questions*, and consider these as inadequate descriptions of what happens in naturally occurring speech. These authors offer alternative analyses of the various patterns found in lists and in questions, using Brazil's discourse intonation model (1985, 1994). As teachers and writers of teaching material, they suggest the need to provide learners with descriptions of intonation, which will allow them to understand the communicative significance of the patterns of intonation identified in such rules, and of the expectations to these rules.

Barr (1990:20-1), describing a successful experiment, stresses the need to make students aware of intonation choices rather than simply teaching them to recognize these choices. In so doing, instead of avoiding the topic intonation as a complex matter 'more likely to hinder students than to help them', the teaching of intonation can be adequately developed once the proper way to teach it is applied.

Research on intonation, involving the application of Brazil's approach to other languages, has led to the confirmation of his principles. Wulffson (1990:60-1), for example, studying intonation of questions in a Swedish saga

found that, contrary to what is usually taught in didactic materials, which associate questions or questioning to the rising tone, this is not always the case:

> In fact a question, or an item functioning as a question, need not be interrogative at all, nor need it carry a rising tone. A single word with a falling intonation, for example, may function perfectly well as a question. Conversely, rising, or falling-rising tones may easily be associated with "statements". Intonational denominators are quite separate from the grammar 'in question'.

I arrived at the same general conclusion when studying the intonation pattern in formal and informal discourse of learned Brazilian-Portuguese speakers (Projeto NURC) (Garcia, 1984), although at a time when Brazil's intonation system had not been published.

Koester (1990:98-9) identified one source of misunderstanding in German EFL speakers, represented by the use of *o* tone 'more for "polite" disagreeing where English speakers used *r* tone'. She ascribes this difference to the 'rarity of *r* tone used by German speakers for this function to an overall infrequency of *r* tone in the German as compared to the English data.' Koester emphasizes the importance of the use of the appropriate intonation to convey the intended meaning, and the need to apply the knowledge of the above mentioned differences to the teaching of spoken English. In the case of her study, she finds 'the possibly more frequent use of *o* tone than *r* tone in German for polite disagreement' as the reason for the low frequency of *r* tones in the German EFL speakers' discourse.

Language must be captured while in use for real, communicative purposes and the resulting description can constitute the basis for a real grammar.

Grammatical items must be viewed within the discourse-specific and meaningful relations, which they realize as the conversation progresses, as the negotiation process unfolds. It is from the existential paradigm rather than from abstract meaning that speakers choose their prominent words, and make their intonation decisions. Selections encode features of the context of interaction, not of the language system alone.

The selection of linguistic items or structures is part of the sociolinguistic, or pragmatic, competence. This fact is implicit in Grice's (as referred to in Levinson, 1983:Ch.4) set of conversational maxims by which co-operative participants are urged to choose informative, relevant, true and consistent language.

Language out of a real context of situation can be produced by mechanical speech devices (Roach, 1983:102,136), but they produce sentences that are rather unnatural and practically unintelligible – lexical items are accurately arranged in syntactic structures, but intonation is missing. However, in the present days, the use of such mechanical speech devices has evolved towards the utilization of pre-recorded stretches of discourse with the proper intonation. It is still true that utterances with every syllable on the same pitch level, without changes in loudness and in speed, and without any pauses are most likely not to convey the intended meaning. Discourse is goal-oriented: intonation should be seen as a fundamental thread by which the speaker's goal, or communication, is realized and, thus, on which meaning heavily depends.

In a discussion on *Respiration and voicing*, Roach (1988:26-7) draws attention to the simplest but seldom mentioned facts about stress and intonation – their relation with the air movement in and out of the lungs. The explanation that follows could not be simpler and yet, how important! It is worth bringing forth a comment by Ladefoged (1975:296) on the tension of the laryngeal muscles of the non-native speaker. In the beginning of her/his experience with a foreign language, while listening, s/he silently tries to imitate the sounds and the rhythm produced by the native speaker just by contracting the muscles of her/his speech organs. When referring to spoken discourse and foreign language learners, Carson (1977), while teaching a course on the phonological structure of English, would emphasize the importance of adapting one's respiratory movements to the rhythm of the foreign language in order to make comprehension easier with less physical effort.

The lack of instruction in an area as simple as that mentioned above leads to almost irrecoverable defects in the pronunciation of Brazilian EFL learners. Preventive measures such as the inclusion of these items in the EFL syllabus would certainly conduce to better performance.

Bradford (1988), in *Intonation in context*, treats intonation within the communicative teaching of spoken English in a way which is easy-to-use and friendly both to the students and, very importantly, to the teachers. Offering a range of exercises for the improvement of intonational features and providing good practice for fluency and accuracy, the book stimulates the learners' creativity while, at the same time, allows for their cognitive response. It, thus, provides a good basis for the teaching of intonation.

Her first aim is to make learners aware of the main features of intonation. For this reason, she simplifies Brazil's terminology in order to make it more understandable in terms of function. Just to give an example, she uses *highlighting* instead of *prominence*, and *telling* instead of *proclaiming*. She also limits herself to the parts of Brazil's system which she feels are most important and most teachable; hence, *key* and *termination* are collectively referred to as *key*, and *orientation* is not included. This may not be the best solution because the identities of *key* and of *termination* should be preserved. On the other hand, *orientation* is too important to be simply omitted.

Further, Bradford adapts Brazil's system of transcription to make it more accessible to students, writing it on a single line, and using arrows, a more familiar notation, to indicate the tones. The seven main units of the book present the three features most commonly occurring: *tone, prominence*, and *key* (pitch).

The author's second aim is to provide enjoyable activities for both controlled and freer practice. Each unit follows the same format of *sensitisation, explanation, imitation, practice activities*, and *communicative activity*. In no section, and at no stage, is mere imitation sufficient, for learners are constantly given alternatives, which make them think about the effect of **what** they are saying and **how** they are saying it. In other words, learners must become conscious of the role of intonation — pitch range and degree of stress — and of the problems in communication, which may arise from inadequate use of the suprasegmental features. They are allowed to choose between working with or without a teacher, that is, on a self-study basis.

The topic **intonation** is becoming more conspicuous in the literature available for the EFL teaching as can be found in Hewings' book (1993) on *Pronunciation Tasks* in which students are expected to work out pronunciation rules for themselves.

Brazil makes a further contribution to this topic in his 1994 book, *Pronunciation for Advanced Learners of English,* in which the learner is encouraged to examine the sound system of English from the point of view of intonation.

Why so much emphasis on the analysis and the teaching of intonation? Are the teaching and learning of pronunciation in general and of intonation, in particular, hopeless? How fruitful can they be? Are results measurable in confrontation with the time and effort that teachers and students are likely to invest in their achievement? These questions arose from the following comment by Roach (1988:p.114), worth transcribing here:

> During the development of modern phonetics in the present century it was for a long time hoped that scientific study of intonation would make it possible to state what the function of each different aspect of intonation was, and that foreign learners could then be taught rules to enable them to use intonation the way the native speakers use it. Few people now believe this to be possible.

It seems a little disturbing, in face of a general belief, that instructional material can be developed for the teaching of English intonation that would enable the learner to communicate almost indiscernibly in a native English-speaking environment. The setting up of the ideal conditions specified by the author (idem:115), such as regular and frequent exposure of learners to native

speakers, are hard to achieve, if not impossible, in terms of the developing world. I believe, however, that continuous effort towards making explicit the rules of intonation, followed by persistent practice, should solve the problem. I equally believe that the chances to learn English intonation are the same as those of learning the pronunciation of segments and the correct use of stress.

English stress placement is a highly complex matter, very difficult for a foreigner to learn on his own, as he does in relation to lexical items and the syntactic string of an utterance. There are rules for the stress placement on morphologically simple and complex words; these rules have to be learnt in spite of their various exceptions. This is nonetheless better than to consider English word stress as deprived from regularity, or to learn stress placement along with each individual word. If it is not difficult for a native speaker of English to pronounce a new word with the correct stress, one would think that stress placement is predictable and, thereby, amenable to rules.

From Roach's (1988:79-85) discussion on *Complex word stress*, it becomes apparent that stress placement on such words is subject to various circumstances, of which the origin of the complex words stands out. He indicates that deeper consideration into this issue would require knowledge of morphology in as many as five or six languages, of which Latin and Greek are outstanding. It might be of interest to observe that words of classical origin are common to a number of languages, their spelling varying slightly, but their stressed syllables being largely dependent on the stress rules of the languages themselves. To give just one example, take the words:

hypothesis [haɪ'pɒθəsɪs] – English, hypothèse [ipo'tɛz] –

French, and hipótese [i'pɔtezɪ] – – Portuguese.

In French, contrary to the English and Portuguese versions, the correspondent word carries the stress on the last syllable (the last e is silent) because of the peculiarity of the stress rules in French – a syllable-timed language.

Word-class pairs with identical spelling (Roach, 1988:84-5) constitute a very common source of mispronunciation. These words differ from each other in stress placement according to their category – noun or adjective *versus* verb, as in the pairs:

'the subject' [ðə'sʌbdʒɛkt]

and

'to subject' [tə səb'dʒɛkt];

'it's perfect' [ɪts'pɜˈfəkt]

and

'to perfect' [tə pɜˈ'fɛkt].

As a consequence, the intensity of stress placed on the main syllable, as opposed to that on the weak half of the word, results in a vowel of different quality, besides altering the rhythm of discourse.

In closing this claim for the need to have intonation included as a regular and distinct part of the *curriculum* of ESL/EFL/EIL, I should like to emphasize

that this conviction is deeply seated on an experience lasting almost four decades as an EFL teacher.

It is encouraging to observe that the ideas expressed above are shared by other persons in this country. Colin Paton (1998:19), Academic Coordinator at Sociedade Brasileira de Cultura Inglesa in Rio de Janeiro, recently took a firm stand for the work on pronunciation, proposing a number of points aimed at sensitising teachers to start working on the subject, of which I detached the following:

1. the importance of both receptive and productive work on phonology to improve spoken intelligibility and listening acuity;

2. the importance of drawing up a plan of work that meets *Brazilian* needs (contrastive analysis);

3. fully integrating pronunciation work with all other areas of the syllabus; and lastly,

4. **start working on pronunciation with your students!!!!!**

To these points I should like to add that good knowledge of the phonology of L1, both segmental and suprasegmental, is essential before embarking on the teaching of the pronunciation of L2.

At this moment, a proposal of some aspects useful for building up a syllabus for the teaching of English as a second language to non-native speakers is in order. This proposal should include those items that, in my experience, are

of help for overcoming the problems related to intonation as discussed in this work.

7.2 Topics for the EFL Syllabus – A Proposal

The teaching of a foreign language should aim at the preparation of speakers with all the abilities in that language. This means that the speaking and writing skills of such a person should be indiscernible from those of the native speakers of the language concerned. The idealization of such performance should include the choice of a certain accent. This is of course very difficult to achieve when the product of such teaching is an experienced NNS, a bilingual speaker of English – BSE, who is fluent, while, at the same time, exhibits a flawless but unidentifiable accent.

In order to achieve this goal, all efforts should be directed, from the part of the teacher as well as from the part of the student, at avoiding the transfer of the systems of the mother tongue to the second language.

English is the object language of this discussion and, because of its growing importance in today's world, I am convinced that the guiding principle for the instruction of learners of English as a foreign language should be to achieve the paradigm mentioned lines above: undistinguishable speaking and writing when compared to native speakers of a widely accepted educated standard.

The prevention of pronunciation problems in the area of intonation should start with the presentation and use of the International Phonetic Alphabet (IPA) at the very beginning of any program of instruction in a foreign language, particularly in English. Students should begin by speaking, not by writing the

target language. Grammatical rules and spelling are, at the onset of a TEFL programme, of secondary importance. As a result, the student's discourse, as s/he acquires L2, would not be loaded with anomalous features such as the insertion and omission of syllables, which spoil the rhythm and contribute to misunderstanding.

Good grammar books and dictionaries can be of sufficient assistance, alongside with the teacher's help, in solving the student's problems in the areas of reading and writing – the written form. This form of the target language should be learnt immediately after the development of the listening and speaking skills – the audio-oral abilities. By means of a step by step form, giving privilege to the audio-oral over the reading-writing aspects, the target language can be completely acquired with a minimum of transfer from the mother tongue.

The adoption of IPA in the routine of TEFL would bring the additional advantage of raising the awareness of the students to the features and problems of their own language. As a consequence, the incidence of errors caused by transfer from the mother tongue to L2 should decrease, or even, disappear. It is well known that transfer is responsible for errors affecting either segments or suprasegments.

Errors or deviations should be carefully identified and classified for each group of students, with their active participation. Progress of their performance should be assessed periodically. Thereby, the persistence of such deviations can be determined and, with the conscious participation of the students, easily eliminated.

Instruction should concentrate, insistently, on drills aimed at the elimination of factors affecting rhythm – inclusion and omission of syllables, reduction of vowels in unstressed syllables – and the assimilation of the peculiarities of intonation in English. As seen in the work reported here, intonation is not easily acquired by simple immersion in the NS environment. It must be the object of intense drilling. This fact brings about the current need to adopt a representative standard tone profile. I recognize the fragility of the standard used in my comparisons since it was not obtained by means of the same method applied to the data from my sample. Additional studies aiming at the determination of the tone profile of native speakers by means of David Brazil's system are required to fill this gap in my studies.

CONCLUSION

Having examined and discussed the results obtained as a consequence of the application of the research methodology described, it is now possible to summarize and give a systematic organization to the conclusions that are scattered in the previous pages.

The observation of the data followed the performance of the group of individuals selected to represent the population of Brazilian post-graduate EFL speakers under two independent variables – *time* and *sex*.

The working hypotheses postulated that the performance of the group in respect to intonation would change under the influence of the university environment in which the individuals were plunged in a six-month period after their arrival at the U.K. It was further hypothesized that females and males would present a different behaviour.

The research results show that:

1. Although significant differences were found regarding some of the discourse features analysed, no important differences of performance can be ascribed to *sex*.

2. The measurement of the relevant features indicates an increase in speed between the first and second interviews, although, by British standards, they rate far behind the native speakers' population.

3. Regarding rhythm, according to the measurement of the features concerned, this suprasegmental is heavily altered in the discourse of the target population. The performance of the group has practically not changed in the time interval considered.

4. It can now be said that indeed the performance of the group, regarding intonation, has varied with *time* in a slightly beneficial way.

5. Regardless of *time* and *sex*, in respect of intonation, the population under study shows characteristics that may lead to poor comprehensibility as a consequence of an abnormal tone profile and to defects in the rhythm of their discourse. No meaningful signs of adaptation to the local pattern could be detected except for a decrease in the number of incomplete tone units and a decrease in the odd choices of tone.

6. The predominance of mK-mT in the *corpus* analysed contributes to a flat discourse. A significant decrease in mK-mT was observed in the second interview indicating some degree of adaptation to the environment.

A follow-up of this research would have been in order so as to renew the evaluation of the group of participants at 12 or 24 months after the first interview.

The methodological procedure utilized allows for an adequate survey of the features affecting intonation thus allowing for the detection of clear-cut trends of the group, both at their proneness to incur in deviations as well as to measure the changes in their performance as a reaction to the native speaking environment. One such reaction observed refers to the increase in *o* tones from the first to the second interview. This effect may well signal the use of an error-avoiding

strategy from the part of the Brazilian EFL speakers by means of the use of a non-committing intonation.

The wealth of documented interviews accumulated in the course of this research can originate a number of further research studies for teams of graduate and post-graduate students.

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APPENDIX

A - II

- Source pages
  Selected from
  Annex II

```
TITLE      'Iria Werlang Garcia   *   PhD Thesis'.
SUBTITLE 'Data Analisis'.

data list file='iria.txt'
        /    id          1 -  7 (A)
             info        8
             sex         9
             time       10
             nrtu       11 - 13
             word       14 - 15
             syll       16 - 17
             wpws       18 - 19
             prom       20 - 21
             wpps       22
             wpts       23
             tone       24
             prop       25
             kt         26
             er         27.


var label    id             'Identification number'
             info           'Number of informant'
             sex            'Sex'
             time           'Interview'
             nrtu           'Nr. of tone units'
             word           'Nr. of words'
             syll           'Nr. of syllables'
             wpws           'Nr. of wrong placed word stresses'
             prom           'Nr. of prominences'
             wpps           'Nr. of wrong placed prominent syllables'
             wpts           'Nr. of wrong placed tonic syllables'
             tone           'Tone'
             prop           'Property of tone'
             kt             'Key and termination'
             er             'Vacilation'.

val label / info       0    'Inf. # 0'
                       1    'Inf. # 1'
                       2    'Inf. # 2'
                       3    'Inf. # 3'
                       4    'Inf. # 4'
                       5    'Inf. # 5'
                       6    'Inf. # 6'
                       7    'Inf. # 7'
                       8    'Inf. # 8'
                       9    'Inf. # 9'
          / sex        1    ' Female '
                       2    '  Male  '
          / time       1    ' First  '
                       2    ' Second '
          / tone       1    '   P    '
                       2    '   R    '
                       3    '   P+   '
                       4    '   R+   '
                       5    '   O    '
                       6    '   PO   '
                       7    '   I    '
          / prop       1    '  Odd   '
                       2    '  Unr   '
```

```
            / kt          1   '   HH   '
                          2   '   HM   '
                          3   '   HL   '
                          4   '   MH   '
                          5   '   MM   '
                          6   '   ML   '
                          7   '   LH   '
                          8   '   LM   '
                          9   '   LL   '
            / er          1   '   Yes  '
                          2   '   No   '  .
```

missing value prom(9) wpws(9) wpps(9) wpts(9) prop(9) kt(0) er(9).

****

FREQUENCIES /VARIABLES WORD TO ER.
The raw data or transformation pass is proceeding
   6191 cases are written to the compressed active file.

***** Memory allows a total of.. .5894 Values, accumulated across all Variables.
      There also may be up to   736 Value Labels for each Variable.

- -

WORD   Nr. of words

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	2593	41.9	41.9	41.9
	2	1772	28.6	28.6	70.5
	3	1014	16.4	16.4	86.9
	4	507	8.2	8.2	95.1
	5	197	3.2	3.2	98.3
	6	71	1.1	1.1	99.4
	7	20	.3	.3	99.7
	8	13	.2	.2	99.9
	9	4	.1	.1	100.0
	Total	6191	100.0	100.0	

Valid cases   6191   Missing cases   0

SYLL   Nr. of syllables

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	1823	29.4	29.4	29.4
	2	1488	24.0	24.0	53.5
	3	1098	17.7	17.7	71.2
	4	723	11.7	11.7	82.9
	5	474	7.7	7.7	90.6
	6	271	4.4	4.4	94.9
	7	158	2.6	2.6	97.5
	8	80	1.3	1.3	98.8
	9	45	.7	.7	99.5
	10	17	.3	.3	99.8
	11	6	.1	.1	99.9
	12	6	.1	.1	100.0
	13	2	.0	.0	100.0
	Total	6191	100.0	100.0	

Valid cases   6191   Missing cases   0

- -

WPWS   Nr. of wrong placed word stresses

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	5258	84.9	93.6	93.6
	1	354	5.7	6.3	99.9
	2	3	.0	.1	100.0
	9	576	9.3	Missing	
	Total	6191	100.0	100.0	

Valid cases   5615   Missing cases   576

PROM   Nr. of prominences

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	3462	55.9	61.7	61.7
	2	1827	29.5	32.5	94.2
	3	306	4.9	5.4	99.6
	4	20	.3	.4	100.0
	9	576	9.3	Missing	
	Total	6191	100.0	100.0	

Valid cases   5615   Missing cases   576

- -

WPPS   Nr. of wrong placed prominent syllables

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	3748	60.5	66.7	66.7
	1	1739	28.1	31.0	97.7
	2	123	2.0	2.2	99.9
	3	4	.1	.1	100.0
	4	1	.0	.0	100.0
	9	576	9.3	Missing	
	Total	6191	100.0	100.0	

Valid cases   5615   Missing cases   576

- -

WPTS   Nr. of wrong placed tonic syllables

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	4296	69.4	76.5	76.5
	1	1317	21.3	23.5	100.0
	2	2	.0	.0	100.0
	9	576	9.3	Missing	
	Total	6191	100.0	100.0	

Valid cases   5615   Missing cases   576

TONE   Tone

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
P	1	2602	42.0	42.0	42.0
P+	3	7	.1	.1	42.1
R+	4	501	8.1	8.1	50.2
O	5	2400	38.8	38.8	89.0
PO	6	105	1.7	1.7	90.7
I	7	576	9.3	9.3	100.0
	Total	6191	100.0	100.0	

Valid cases   6191   Missing cases   0

- -

PROP   Property of tone

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Odd	1	1232	19.9	21.9	21.9
Unr	2	4383	70.8	78.1	100.0
	9	576	9.3	Missing	
	Total	6191	100.0	100.0	

Valid cases   5615   Missing cases   576

KT   Key and termination

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
HH	1	582	9.4	10.4	10.4
HM	2	393	6.3	7.0	17.4
HL	3	13	.2	.2	17.6
MH	4	196	3.2	3.5	21.1
MM	5	3933	63.5	70.0	91.1
ML	6	293	4.7	5.2	96.3
LL	9	205	3.3	3.7	100.0
	0	576	9.3	Missing	
		-------	-------	-------	
	Total	6191	100.0	100.0	

Valid cases   5615   Missing cases   576

- -

ER   Vacilation

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Yes	1	484	7.8	8.6	8.6
No	2	5131	82.9	91.4	100.0
	9	576	9.3	Missing	
		-------	-------	-------	
	Total	6191	100.0	100.0	

Valid cases   5615   Missing cases   576

TONE   Tone   by SEX   Sex

```
                      SEX           Page 1 of 1
              Count  |
              Row Pct | Female     Male
              Col Pct |                      Row
                      |      1 |      2 | Total
TONE        ---------+--------+--------+
           1 |   1189 |   1413 |   2602
     P       |   45.7 |   54.3 |   42.0
             |   42.3 |   41.8 |
             +--------+--------+
           3 |      4 |      3 |      7
     P+      |   57.1 |   42.9 |     .1
             |     .1 |     .1 |
             +--------+--------+
           4 |    262 |    239 |    501
     R+      |   52.3 |   47.7 |    8.1
             |    9.3 |    7.1 |
             +--------+--------+
           5 |   1060 |   1340 |   2400
     O       |   44.2 |   55.8 |   38.8
             |   37.7 |   39.7 |
             +--------+--------+
           6 |     57 |     48 |    105
     PO      |   54.3 |   45.7 |    1.7
             |    2.0 |    1.4 |
             +--------+--------+
           7 |    241 |    335 |    576
     I       |   41.8 |   58.2 |    9.3
             |    8.6 |    9.9 |
             +--------+--------+
        Column    2813     3378     6191
         Total    45.4     54.6    100.0
```

Chi-Square	Value	DF	Significance
Pearson	17.84663	5	.00315
Likelihood Ratio	17.79488	5	.00321
Mantel-Haenszel test for linear association	1.23645	1	.26616

Minimum Expected Frequency -   3.181
Cells with Expected Frequency < 5 -   2 OF   12 (16.7%)

Number of Missing Observations: 0

TONE   Tone   by   TIME   Interview

```
                     TIME          Page 1 of 1
               Count  |
               Row Pct | First    Second
               Col Pct |                     Row
                       |     1  |      2  | Total
TONE        ---------+--------+--------+
             1  |  1266  |  1336  |  2602
     P          |  48.7  |  51.3  |  42.0
                |  42.6  |  41.5  |
                +--------+--------+
             3  |     5  |     2  |     7
     P+         |  71.4  |  28.6  |    .1
                |    .2  |    .1  |
                +--------+--------+
             4  |   276  |   225  |   501
     R+         |  55.1  |  44.9  |   8.1
                |   9.3  |   7.0  |
                +--------+--------+
             5  |  1057  |  1343  |  2400
     O          |  44.0  |  56.0  |  38.8
                |  35.6  |  41.7  |
                +--------+--------+
             6  |    50  |    55  |   105
     PO         |  47.6  |  52.4  |   1.7
                |   1.7  |   1.7  |
                +--------+--------+
             7  |   317  |   259  |   576
     I          |  55.0  |  45.0  |   9.3
                |  10.7  |   8.0  |
                +--------+--------+
          Column    2971     3220     6191
           Total    48.0     52.0    100.0
```

Chi-Square	Value	DF	Significance
Pearson	38.56824	5	.00000
Likelihood Ratio	38.64617	5	.00000
Mantel-Haenszel test for linear association	.10188	1	.74958

Minimum Expected Frequency -   3.359
Cells with Expected Frequency < 5 -   2 OF   12 (16.7%)

Number of Missing Observations: 0

TONE   Tone   by   INFO   Number of informant

		INFO					Page 1 of 2
	Count Row Pct Col Pct	Inf. # 0	Inf. # 1	Inf. # 2	Inf. # 3	Inf. # 4	Row
		0	1	2	3	4	Total
TONE							
P	1	186 7.1 35.3	207 8.0 41.9	260 10.0 45.9	309 11.9 46.6	227 8.7 40.4	2602 42.0
P+	3		1 14.3 .2		2 28.6 .3	1 14.3 .2	7 .1
R+	4	32 6.4 6.1	26 5.2 5.3	73 14.6 12.9	64 12.8 9.7	67 13.4 11.9	501 8.1
O	5	265 11.0 50.3	219 9.1 44.3	160 6.7 28.2	199 8.3 30.0	217 9.0 38.6	2400 38.8
PO	6	6 5.7 1.1	14 13.3 2.8	11 10.5 1.9	15 14.3 2.3	11 10.5 2.0	105 1.7
I	7	38 6.6 7.2	27 4.7 5.5	63 10.9 11.1	74 12.8 11.2	39 6.8 6.9	576 9.3
(Continued)	Column Total	527 8.5	494 8.0	567 9.2	663 10.7	562 9.1	6191 100.0

TONE   Tone by INFO   Number of informant

Count Row Pct Col Pct	Inf. # 5 5	Inf. # 6 6	Inf. # 7 7	Inf. # 8 8	Inf. # 9 9	Row Total
TONE						
1 P	289 11.1 40.0	303 11.6 43.8	302 11.6 46.0	251 9.6 41.6	268 10.3 38.0	2602 42.0
3 P+			2 28.6 .3		1 14.3 .1	7 .1
4 R+	36 7.2 5.0	59 11.8 8.5	46 9.2 7.0	22 4.4 3.6	76 15.2 10.8	501 8.1
5 O	298 12.4 41.3	252 10.5 36.5	235 9.8 35.8	245 10.2 40.6	310 12.9 43.9	2400 38.8
6 PO	12 11.4 1.7	5 4.8 .7	14 13.3 2.1	9 8.6 1.5	8 7.6 1.1	105 1.7
7 I	87 15.1 12.0	72 12.5 10.4	57 9.9 8.7	76 13.2 12.6	43 7.5 6.1	576 9.3
Column Total	722 11.7	691 11.2	656 10.6	603 9.7	706 11.4	6191 100.0

Chi-Square	Value	DF	Significance
Pearson	205.47802	45	.00000
Likelihood Ratio	212.41523	45	.00000
Mantel-Haenszel test for linear association	.02547	1	.87319

Minimum Expected Frequency -   .559
Cells with Expected Frequency < 5 -   10 OF   60 (16.7%)

Number of Missing Observations: 0

PROP   Property of tone   by   SEX   Sex

```
                    SEX           Page 1 of 1
              Count  |
              Row Pct | Female   Male
              Col Pct |                     Row
                      | .   1  |      2  | Total
PROP         ---------+--------+--------+
              1  |    563  |   669  |  1232
     Odd         |   45.7  |  54.3  |  21.9
                 |   21.9  |  22.0  |
              +--------+--------+
              2  |   2009  |  2374  |  4383
     Unr         |   45.8  |  54.2  |  78.1
                 |   78.1  |  78.0  |
              +--------+--------+
           Column    2572     3043     5615
            Total    45.8     54.2    100.0
```

Chi-Square	Value	DF	Significance
Pearson	.00739	1	.93149
Continuity Correction	.00287	1	.95724
Likelihood Ratio	.00729	1	.93197
Mantel-Haenszel test for linear association	.00739	1	.93149

Minimum Expected Frequency - 564.328

Number of Missing Observations: 576

PROP   Property of tone   by   TIME Interview

```
                    TIME           Page 1 of 1
            Count  |
            Row Pct | First    Second
            Col Pct |                    Row
                    |     1  |     .2  | Total
PROP        --------+--------+--------+
              1  |    635  |    597  |  1232
     Odd         |   51.5  |   48.5  |  21.9
                 |   23.9  |   20.2  |
                 +--------+--------+
              2  |   2019  |   2364  |  4383
     Unr         |   46.1  |   53.9  |  78.1
                 |   76.1  |   79.8  |
                 +--------+--------+
          Column     2654     2961     5615
           Total     47.3     52.7    100.0
```

Chi-Square	Value	DF	Significance
Pearson	11.57753	1	.00067
Continuity Correction	11.35880	1	.00075
Likelihood Ratio	11.56261	1	.00067
Mantel-Haenszel test for linear association	11.57546	1	.00067

Minimum Expected Frequency - 582.320

Number of Missing Observations: 576

KT Key and termination by SEX Sex

```
                        SEX         '       Page 1 of 1
                Count   |
                Row Pct | Female    Male
                Col Pct |                       Row
                        |     1   |      2   | Total
KT          ------------+---------+----------+
                  1  |    214  |    368  |    582
        HH           |   36.8  |   63.2  |   10.4
                     |    8.3  |   12.1  |
                     +---------+---------+
                  2  |    167  |    226  |    393
        HM           |   42.5  |   57.5  |    7.0
                     |    6.5  |    7.4  |
                     +---------+---------+
                  3  |      7  |      6  |     13
        HL           |   53.8  |   46.2  |     .2
                     |     .3  |     .2  |
                     +---------+---------+
                  4  |     80  |    116  |    196
        MH           |   40.8  |   59.2  |    3.5
                     |    3.1  |    3.8  |
                     +---------+---------+
                  5  |   1856  |   2077  |   3933
        MM           |   47.2  |   52.8  |   70.0
                     |   72.2  |   68.3  |
                     +---------+---------+
                  6  |    161  |    132  |    293
        ML           |   54.9  |   45.1  |    5.2
                     |    6.3  |    4.3  |
                     +---------+---------+
                  9  |     87  |    118  |    205
        LL           |   42.4  |   57.6  |    3.7
                     |    3.4  |    3.9  |
                     +---------+---------+
              Column     2572     3043      5615
              Total      45.8     54.2     100.0
```

Chi-Square	Value	DF	Significance
Pearson	37.02405	6	.00000
Likelihood Ratio	37.30684	6	.00000
Mantel-Haenszel test for linear association	17.12071	1	.00004

Minimum Expected Frequency -   5.955

Number of Missing Observations: 576

KT   Key and termination   by   TIME   Interview

```
                    TIME          Page 1 of 1
              Count |
              Row Pct | First    Second
              Col Pct |                      Row
                      |    1  |     2  | Total
KT           ---------+--------+--------+
              1  |   235  |   347  |   582
        HH       | 40.4   | 59.6   | 10.4
                 |  8.9   | 11.7   |
              +--------+--------+
              2  |   156  |   237  |   393
        HM       | 39.7   | 60.3   |  7.0
                 |  5.9   |  8.0   |
              +--------+--------+
              3  |     7  |     6  |    13
        HL       | 53.8   | 46.2   |   .2
                 |   .3   |   .2   |
              +--------+--------+
              4  |    93  |   103  |   196
        MH       | 47.4   | 52.6   |  3.5
                 |  3.5   |  3.5   |
              +--------+--------+
              5  |  1908  |  2025  |  3933
        MM       | 48.5   | 51.5   | 70.0
                 | 71.9   | 68.4   |
              +--------+--------+
              6  |   142  |   151  |   293
        ML       | 48.5   | 51.5   |  5.2
                 |  5.4   |  5.1   |
              +--------+--------+
              9  |   113  |    92  |   205
        LL       | 55.1   | 44.9   |  3.7
                 |  4.3   |  3.1   |
              +--------+--------+
          Column    2654     2961     5615
          Total     47.3     52.7    100.0
```

Chi-Square	Value	DF	Significance
Pearson	28.04187	6	.00009
Likelihood Ratio	28.20951	6	.00009
Mantel-Haenszel test for linear association	25.83913	1	.00000

Minimum Expected Frequency -   6.145

Number of Missing Observations: 576

KT Key and termination by INFO Number of informant

		INFO					Page 1 of 2
	Count						
	Row Pct	Inf. # 0	Inf. # 1	Inf. # 2	Inf. # 3	Inf. # 4	
	Col Pct						Row
		0	1	2	3	4	Total
KT							
HH	1	38	39	49	54	34	582
		6.5	6.7	8.4	9.3	5.8	10.4
		7.8	8.4	9.7	9.2	6.5	
HM	2	54	21	27	42	23	393
		13.7	5.3	6.9	10.7	5.9	7.0
		11.0	4.5	5.4	7.1	4.4	
HL	3	4	2			1	13
		30.8	15.4			7.7	.2
		.8	.4			.2	
MH	4	4	2	10	16	48	196
		2.0	1.0	5.1	8.2	24.5	3.5
		.8	.4	2.0	2.7	9.2	
MM	5	326	370	373	403	384	3933
		8.3	9.4	9.5	10.2	9.8	70.0
		66.7	79.2	74.0	68.4	73.4	
ML	6	41	20	21	52	27	293
		14.0	6.8	7.2	17.7	9.2	5.2
		8.4	4.3	4.2	8.8	5.2	
LL	9	22	13	24	22	6	205
		10.7	6.3	11.7	10.7	2.9	3.7
		4.5	2.8	4.8	3.7	1.1	
	Column	489	467	504	589	523	5615
(Continued)	Total	8.7	8.3	9.0	10.5	9.3	100.0

KT Key and termination by INFO Number of informant

	INFO					Page 2 of 2
Count Row Pct Col Pct	Inf. # 5 5	Inf. # 6 6	Inf. # 7 7	Inf. # 8 8	Inf. # 9 9	Row Total
KT						
1 HH	56 9.6 8.8	49 8.4 7.9	88 15.1 14.7	39 6.7 7.4	136 23.4 20.5	582 10.4
2 HM	61 15.5 9.6	46 11.7 7.4	31 7.0 5.2	43 10.0 8.2	45 11.5 6.8	393 7.0
3 HL	4 30.8 .6	1 7.7 .2		1 7.7 .2		13 .2
4 MH	20 10.2 3.1	20 10.2 3.2	41 20.9 6.8	14 7.1 2.7	21 10.7 3.2	196 3.5
5 MM	446 11.3 70.2	436 11.1 70.4	387 9.8 64.6	399 10.1 75.7	409 10.4 61.7	3933 70.0
6 ML	24 8.2 3.8	43 14.7 6.9	21 7.2 3.5	21 7.2 4.0	23 7.8 3.5	293 5.2
9 LL	24 11.7 3.8	24 11.7 3.9	31 15.1 5.2	10 4.9 1.9	29 14.1 4.4	205 3.7
Column Total	635 11.3	619 11.0	599 10.7	527 9.4	663 11.8	5615 100.0

Chi-Square	Value	DF	Significance
Pearson	329.79020	54	.00000
Likelihood Ratio	311.13998	54	.00000
Mantel-Haenszel test for linear association	26.21435	1	.00000

Minimum Expected Frequency -   1.081
Cells with Expected Frequency < 5 -   10 OF   70 (14.3%)

ER Vacilation by SEX Sex

```
                      SEX              Page 1 of 1
              Count  |
              Row Pct | Female    Male
              Col Pct |                      Row
                      |    1   |     2  | Total
ER            --------+--------+--------+
           1  |   243  |    241 |   484
    Yes       |  50.2  |   49.8 |   8.6
              |   9.4  |    7.9 |
              +--------+--------+
           2  |  2329  |   2802 |  5131
    No        |  45.4  |   54.6 |  91.4
              |  90.6  |   92.1 |
              +--------+--------+
           Column    2572     3043     5615
            Total    45.8     54.2    100.0
```

Chi-Square	Value	DF	Significance
Pearson	4.13209	1	.04208
Continuity Correction	3.94037	1	.04714
Likelihood Ratio	4.11869	1	.04241
Mantel-Haenszel test for linear association	4.13136	1	.04210

Minimum Expected Frequency - 221.700

Number of Missing Observations: 576

ER Vacilation by TIME Interview

```
                    TIME            Page 1 of 1
            Count  |
            Row Pct | First    Second
            Col Pct |                    Row
                    |    1  |     2  | Total
ER          --------+--------+--------+
               1 |   235  |   249  |   484
     Yes         |  48.6  |  51.4  |   8.6
                 |   8.9  |   8.4  |
                 +--------+--------+
               2 |  2419  |  2712  |  5131
     No          |  47.1  |  52.9  |  91.4
                 |  91.1  |  91.6  |
                 +--------+--------+
          Column   2654     2961     5615
           Total   47.3     52.7    100.0
```

Chi-Square	Value	DF	Significance
Pearson	.35223	1	.55285
Continuity Correction	.29797	1	.58516
Likelihood Ratio	.35180	1	.55310
Mantel-Haenszel test for linear association	.35217	1	.55289

Minimum Expected Frequency - 228.769

Number of Missing Observations: 576

ER Vacilation by INFO Number of informant

		INFO					Page 1 of 2
	Count	Inf. # 0	Inf. # 1	Inf. # 2	Inf. # 3	Inf. # 4	
	Row Pct						Row
	Col Pct	0	1	2	3	4	Total
ER							
Yes	1	43	51	48	48	53	484
		8.9	10.5	9.9	9.9	11.0	8.6
		8.8	10.9	9.5	8.1	10.1	
No	2	446	416	456	541	470	5131
		8.7	8.1	8.9	10.5	9.2	91.4
		91.2	89.1	90.5	91.9	89.9	
(Continued)	Column Total	489	467	504	589	523	5615
		8.7	8.3	9.0	10.5	9.3	100.0

ER Vacilation by INFO Number of informant

```
                  INFO                                          Page 2 of 2
            Count  |
            Row Pct |Inf. # 5 Inf. # 6 Inf. # 7 Inf. # 8 Inf. # 9
            Col Pct |                                                    Row
                    |      5  |      6  |      7  |      8  |      9  | Total
ER          --------+---------+---------+---------+---------+---------+
               1  |     32  |     44  |     68  |     52  |     45  |   484
      Yes         |    6.6  |    9.1  |   14.0  |   10.7  |    9.3  |   8.6
                  |    5.0  |    7.1  |   11.4  |    9.9  |    6.8  |
            +---------+---------+---------+---------+---------+
               2  |    603  |    575  |    531  |    475· |    618  |  5131
      No          |   11.8  |   11.2  |   10.3  |    9.3  |   12.0  |  91.4
                  |   95.0  |   92.9  |   88.6  |   90.1  |   93.2  |
            +---------+---------+---------+---------+---------+
            Column    635       619       599       527       663      5615
            Total    11.3      11.0      10.7       9.4      11.8     100.0
```

```
        Chi-Square                  Value           DF          Significance
------------------------          -----------       ----        ------------

Pearson                           27.04365           9              .00138
Likelihood Ratio                  28.19086           9              .00089
Mantel-Haenszel test for           1.33144           1              .24855
      linear association
```

Minimum Expected Frequency -   40.254

Number of Missing Observations: 576

Summaries of   NRTU   Nr. of tone units
By levels of   TIME   Interview
               SEX   Sex
               INFO   Number of informant

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			314.9221	40.2114	6191
TIME	1	First	301.6375	36.8811	2971
SEX	1	Female	272.7282	23.2556	1354
INFO	0	Inf. # 0	252.0000	.0000	252
INFO	1	Inf. # 1	245.0000	.0000	245
INFO	2	Inf. # 2	265.0000	.0000	265
INFO	3	Inf. # 3	308.0000	.0000	308
INFO	4	Inf. # 4	284.0000	.0000	284
SEX	2	Male	325.8448	27.5769	1617
INFO	5	Inf. # 5	361.0000	.0000	361
INFO	6	Inf. # 6	331.0000	.0000	331
INFO	7	Inf. # 7	309.0000	.0000	309
INFO	8	Inf. # 8	278.0000	.0000	278
INFO	9	Inf. # 9	338.0000	.0000	338
TIME	2	Second	327.1795	39.2577	3220
SEX	1	Female	296.1885	37.1107	1459
INFO	0	Inf. # 0	275.0000	.0000	275
INFO	1	Inf. # 1	249.0000	.0000	249
INFO	2	Inf. # 2	302.0000	.0000	302
INFO	3	Inf. # 3	355.0000	.0000	355
INFO	4	Inf. # 4	278.0000	.0000	278
SEX	2	Male	352.8558	14.9012	1761
INFO	5	Inf. # 5	361.0000	.0000	361
INFO	6	Inf. # 6	360.0000	.0000	360
INFO	7	Inf. # 7	347.0000	.0000	347
INFO	8	Inf. # 8	325.0000	.0000	325
INFO	9	Inf. # 9	368.0000	.0000	368

Total Cases =   6191

Summaries of   WORD   Nr. of words
By levels of   TIME   Interview
               SEX   Sex
               INFO   Number of informant

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			2.0833	1.2496	6191
TIME	1	First	2.0552	1.2165	2971
SEX	1	Female	2.0340	1.2135	1354
INFO	0	Inf. # 0	2.1667	1.2858	252
INFO	1	Inf. # 1	2.1469	1.4239	245
INFO	2	Inf. # 2	1.7434	1.0272	265
INFO	3	Inf. # 3	2.0260	1.0826	308
INFO	4	Inf. # 4	2.0986	1.2084	284
SEX	2	Male	2.0730	1.2190	1617
INFO	5	Inf. # 5	2.2687	1.3488	361
INFO	6	Inf. # 6	2.0665	1.1916	331
INFO	7	Inf. # 7	2.1294	1.2390	309
INFO	8	Inf. # 8	2.0432	1.2069	278
INFO	9	Inf. # 9	1.8432	1.0460	338
TIME	2	Second	2.1093	1.2790	3220
SEX	1	Female	2.0055	1.2434	1459
INFO	0	Inf. # 0	2.1418	1.3447	275
INFO	1	Inf. # 1	1.8554	1.2649	249
INFO	2	Inf. # 2	1.7020	.9768	302
INFO	3	Inf. # 3	1.9493	1.1609	355
INFO	4	Inf. # 4	2.4065	1.3610	278
SEX	2	Male	2.1953	1.3018	1761
INFO	5	Inf. # 5	2.4404	1.5501	361
INFO	6	Inf. # 6	2.0889	1.2255	360
INFO	7	Inf. # 7	2.3314	1.3222	347
INFO	8	Inf. # 8	2.0215	1.1478	325
INFO	9	Inf. # 9	2.0842	1.1677	368

Total Cases =   6191

Summaries of   SYLL   Nr. of syllables
By levels of   TIME   Interview
               SEX   Sex
               INFO   Number of informant

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			2.8212	1.8720	6191
TIME	1	First	2.7960	1.8296	2971
SEX	1	Female	2.6972	1.7437	1354
INFO	0	Inf. # 0	2.9524	1.9531	252
INFO	1	Inf. # 1	2.6245	1.8078	245
INFO	2	Inf. # 2	2.4491	1.5220	265
INFO	3	Inf. # 3	2.5779	1.6275	308
INFO	4	Inf. # 4	2.8944	1.7682	284
SEX	2	Male	2.8788	1.8952	1617
INFO	5	Inf. # 5	3.2216	2.2350	361
INFO	6	Inf. # 6	2.6767	1.8244	331
INFO	7	Inf. # 7	2.9838	1.9026	309
INFO	8	Inf. # 8	2.8849	1.7968	278
INFO	9	Inf. # 9	2.6095	1.5546	338
TIME	2	Second	2.8444	1.9101	3220
SEX	1	Female	2.7300	1.8499	1459
INFO	0	Inf. # 0	2.8400	2.0244	275
INFO	1	Inf. # 1	2.6867	1.9568	249
INFO	2	Inf. # 2	2.3510	1.4995	302
INFO	3	Inf. # 3	2.5915	1.7188	355
INFO	4	Inf. # 4	3.2482	1.9616	278
SEX	2	Male	2.9392	1.9541	1761
INFO	5	Inf. # 5	3.3906	2.4094	361
INFO	6	Inf. # 6	2.6278	1.7281	360
INFO	7	Inf. # 7	3.2392	2.0366	347
INFO	8	Inf. # 8	2.8031	1.8014	325
INFO	9	Inf. # 9	2.6386	1.5598	368

   Total Cases =   6191

Summaries of   WPWS   Nr. of wrong placed word stresses
By levels of   TIME   Interview
                SEX   Sex
                INFO   Number of informant

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			.0641	.2471	5615
TIME	1	First	.0656	.2506	2654
SEX	1	Female	.0583	.2379	1218
INFO	0	Inf. # 0	.0089	.0943	224
INFO	1	Inf. # 1	.0131	.1140	229
INFO	2	Inf. # 2	.0418	.2206	239
INFO	3	Inf. # 3	.1245	.3308	265
INFO	4	Inf. # 4	.0881	.2840	261
SEX	2	Male	.0717	.2608	1436
INFO	5	Inf. # 5	.0680	.2521	309
INFO	6	Inf. # 6	.0761	.2657	289
INFO	7	Inf. # 7	.0490	.2161	286
INFO	8	Inf. # 8	.1191	.3376	235
INFO	9	Inf. # 9	.0568	.2318	317
TIME	2	Second	.0628	.2441	2961
SEX	1	Female	.0650	.2496	1354
INFO	0	Inf. # 0	.0189	.1363	265
INFO	1	Inf. # 1	.0168	.1288	238
INFO	2	Inf. # 2	.0679	.2521	265
INFO	3	Inf. # 3	.1204	.3259	324
INFO	4	Inf. # 4	.0840	.2913	262
SEX	2	Male	.0610	.2394	1607
INFO	5	Inf. # 5	.0491	.2164	326
INFO	6	Inf. # 6	.0636	.2445	330
INFO	7	Inf. # 7	.0607	.2392	313
INFO	8	Inf. # 8	.0890	.2853	292
INFO	9	Inf. # 9	.0462	.2103	346

Total Cases =   6191
Missing Cases =   576 OR   9.3 PCT.

Summaries of   WPPS   Nr. of wrong placed prominent syllables
By levels of   TIME   Interview
               SEX   Sex
               INFO   Number of informant

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			.3564	.5288	5615
TIME	1	First	.3561	.5283	2654
SEX	1	Female	.3662	.5353	1218
INFO	0	Inf. # 0	.3259	.4885	224
INFO	1	Inf. # 1	.2009	.4015	229
INFO	2	Inf. # 2	.3264	.5288	239
INFO	3	Inf. # 3	.5396	.6025	265
INFO	4	Inf. # 4	.4061	.5580	261
SEX	2	Male	.3475	.5224	1436
INFO	5	Inf. # 5	.3851	.5320	309
INFO	6	Inf. # 6	.3910	.5553	289
INFO	7	Inf. # 7	.3671	.5247	286
INFO	8	Inf. # 8	.3447	.5274	235
INFO	9	Inf. # 9	.2555	.4649	317
TIME	2	Second	.3566	.5293	2961
SEX	1	Female	.3789	.5536	1354
INFO	0	Inf. # 0	.3660	.5487	265
INFO	1	Inf. # 1	.2185	.4141	238
INFO	2	Inf. # 2	.4264	.6118	265
INFO	3	Inf. # 3	.4290	.5765	324
INFO	4	Inf. # 4	.4275	.5541	262
SEX	2	Male	.3379	.5074	1607
INFO	5	Inf. # 5	.3926	.5484	326
INFO	6	Inf. # 6	.4182	.5353	330
INFO	7	Inf. # 7	.3578	.5124	313
INFO	8	Inf. # 8	.2877	.4684	292
INFO	9	Inf. # 9	.2341	.4441	346

   Total Cases =   6191
Missing Cases =   576 OR   9.3 PCT.

Summaries of   WPTS   Nr. of wrong placed tonic syllables
By levels of   TIME   Interview
                SEX   Sex
                INFO   Number of informant

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			.2353	.4250	5615
TIME	1	First	.2216	.4163	2654
SEX	1	Female	.1864	.3917	1218
INFO	0	Inf. # 0	.1250	.3315	224
INFO	1	Inf. # 1	.1048	.3070	229
INFO	2	Inf. # 2	.1590	.3777	239
INFO	3	Inf. # 3	.3170	.4662	265
INFO	4	Inf. # 4	.2031	.4031	261
SEX	2	Male	.2514	.4340	1436
INFO	5	Inf. # 5	.2751	.4473	309
INFO	6	Inf. # 6	.2526	.4353	289
INFO	7	Inf. # 7	.2587	.4387	286
INFO	8	Inf. # 8	.2809	.4504	235
INFO	9	Inf. # 9	.1987	.3997	317
TIME	2	Second	.2476	.4324	2961
SEX	1	Female	.2304	.4213	1354
INFO	0	Inf. # 0	.1925	.3950	265
INFO	1	Inf. # 1	.1639	.3709	238
INFO	2	Inf. # 2	.2264	.4193	265
INFO	3	Inf. # 3	.2932	.4559	324
INFO	4	Inf. # 4	.2557	.4371	262
SEX	2	Male	.2620	.4413	1607
INFO	5	Inf. # 5	.3344	.4790	326
INFO	6	Inf. # 6	.2970	.4576	330
INFO	7	Inf. # 7	.2843	.4518	313
INFO	8	Inf. # 8	.2363	.4255	292
INFO	9	Inf. # 9	.1618	.3688	346

Total Cases =   6191
Missing Cases =   576 OR   9.3 PCT.

Summaries of   PROM   Nr. of prominences
By levels of   TIME   Interview
                SEX   Sex
                INFO   Number of informant

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			1.4451	.6143	5615
TIME	1	First	1.4341	.6121	2654
SEX	1	Female	1.4466	.6195	1218
INFO	0	Inf. # 0	1.4821	.6350	224
INFO	1	Inf. # 1	1.3275	.5398	229
INFO	2	Inf. # 2	1.3431	.5340	239
INFO	3	Inf. # 3	1.5094	.6223	265
INFO	4	Inf. # 4	1.5517	.7086	261
SEX	2	Male	1.4234	.6058	1436
INFO	5	Inf. # 5	1.4822	.6912	309
INFO	6	Inf. # 6	1.3737	.5579	289
INFO	7	Inf. # 7	1.4580	.6012	286
INFO	8	Inf. # 8	1.4809	.6360	235
INFO	9	Inf. # 9	1.3375	.5244	317
TIME	2	Second	1.4549	.6163	2961
SEX	1	Female	1.4586	.6283	1354
INFO	0	Inf. # 0	1.5283	.7178	265
INFO	1	Inf. # 1	1.3193	.5578	238
INFO	2	Inf. # 2	1.4264	.6056	265
INFO	3	Inf. # 3	1.4105	.5793	324
INFO	4	Inf. # 4	1.6069	.6388	262
SEX	2	Male	1.4518	.6061	1607
INFO	5	Inf. # 5	1.5828	.6731	326
INFO	6	Inf. # 6	1.4182	.5630	330
INFO	7	Inf. # 7	1.4473	.6134	313
INFO	8	Inf. # 8	1.4589	.6218	292
INFO	9	Inf. # 9	1.3584	.5372	346

    Total Cases =   6191
Missing Cases =   576 OR   9.3 PCT.

- - - - - - - - - - O N E W A Y - - - - - - - - - - -

      Variable   NRTU   Nr. of tone units
  By Variable   SEX   Sex

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	2079150.562	2079150.562	3148.3932	.0000
Within Groups	2969	1960682.021	660.3846		
Total	2970	4039832.583			

Group	Count	Mean	Standard Deviation	Standard Error	95 Pct Conf Int for Mean		
Female	1354	272.7282	23.2556	.6320	271.4884	To	273.9680
Male	1617	325.8448	27.5769	.6858	324.4996	To	327.1899
Total	2971	301.6375	36.8811	.6766	300.3108	To	302.9642

Group	Minimum	Maximum
Female	245.0000	308.0000
Male	278.0000	361.0000
Total	245.0000	361.0000

No Range Tests performed with fewer than three non-empty groups.

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Variable   WORD   Nr. of words
By Variable SEX   Sex

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	1.1209	1.1209	.7574	.3842
Within Groups	2969	4393.8262	1.4799		
Total	2970	4394.9472			

Group	Count	Mean	Standard Deviation	Standard Error	95 Pct Conf Int for Mean		
Female	1354	2.0340	1.2135	.0330	1.9693	To	2.0987
Male	1617	2.0730	1.2190	.0303	2.0135	To	2.1324
Total	2971	2.0552	1.2165	.0223	2.0114	To	2.0990

Group	Minimum	Maximum
Female	1.0000	9.0000
Male	1.0000	9.0000
Total	1.0000	9.0000

No Range Tests performed with fewer than three non-empty groups.

- - - - - - - - - - O N E W A Y - - - - - - - - - - -

           Variable   WORD   Nr. of words
        By Variable   SEX   Sex

                          Analysis of Variance

                                   Sum of   Mean   F   F
             Source   D.F.   Squares   Squares   Ratio   Prob.

Between Groups   1   28.7625   28.7625   17.6747 .0000

Within Groups   3218   5236.7580   1.6273

Total   3219   5265.5205

                                   Standard   Standard
Group   Count   Mean   Deviation   Error   95 Pct Conf Int for Mean

  Female   1459   2.0055   1.2434   .0326   1.9416   To   2.0693
  Male   1761   2.1953   1.3018   .0310   2.1345   To   2.2562

Total   3220   2.1093   1.2790   .0225   2.0651   To   2.1535

Group   Minimum   Maximum

  Female   1.0000   9.0000
  Male   1.0000   8.0000

Total   1.0000   9.0000

No Range Tests performed with fewer than three non-empty groups.

- - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable SYLL   Nr. of syllables
By Variable SEX   Sex

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	34.9497	34.9497	9.6044	.0020
Within Groups	3218	11710.0997	3.6389		
Total	3219	11745.0494			

Group	Count	Mean	Standard Deviation	Standard Error	95 Pct Conf Int for Mean		
Female	1459	2.7300	1.8499	.0484	2.6349	To	2.8250
Male	1761	2.9392	1.9541	.0466	2.8479	To	3.0306
Total	3220	2.8444	1.9101	.0337	2.7784	To	2.9104

Group	Minimum	Maximum
Female	1.0000	13.0000
Male	1.0000	13.0000
Total	1.0000	13.0000

No Range Tests performed with fewer than three non-empty groups.

- - - - - - - - - - O N E W A Y - - - - - - - - - - - -

        Variable WPWS   Nr. of wrong placed word stresses
      By Variable SEX   Sex

                        Analysis of Variance

| | | Sum of | Mean | F | F |
Source	D.F.	Squares	Squares	Ratio	Prob.
Between Groups	1	.0118	.0118	.1983	.6562
Within Groups	2959	176.3043	.0596		
Total	2960	176.3161			

| | | | Standard | Standard | | | |
Group	Count	Mean	Deviation	Error	95 Pct Conf Int for Mean		
Female	1354	.0650	.2496	.0068	.0517	To	.0783
Male	1607	.0610	.2394	.0060	.0493	To	.0727
Total	2961	.0628	.2441	.0045	.0540	To	.0716

Group	Minimum	Maximum
Female	.0000	2.0000
Male	.0000	1.0000
Total	.0000	2.0000

No Range Tests performed with fewer than three non-empty groups.

- - - - - - - - - O N E W A Y - - - - - - - - - -

        Variable WPPS   Nr. of wrong placed prominent syllables
     By Variable SEX   Sex

                          Analysis of Variance

                                   Sum of   Mean   F   F
              Source   D.F. Squares   Squares   Ratio   Prob.

Between Groups   1   1.2341   1.2341   4.4095   .0358

Within Groups   2959   828.1580   .2799

Total   2960   829.3921

                                Standard   Standard
Group   Count   Mean   Deviation   Error   95 Pct Conf Int for Mean

  Female   1354   .3789   .5536   .0150   .3494   To   .4084
  Male   1607   .3379   .5074   .0127   .3131   To   .3627

Total   2961   .3566   .5293   .0097   .3376   To   .3757

Group   Minimum   Maximum

  Female   .0000   4.0000
  Male   .0000   2.0000

Total   .0000   4.0000

No Range Tests performed with fewer than three non-empty groups.

- - - - - - - - - - O N E W A Y - - - - - - - - - -

        Variable WPTS   Nr. of wrong placed tonic syllables
     By Variable SEX   Sex

                              Analysis of Variance

                                  Sum of   Mean   F   F
            Source   D.F.   Squares   Squares   Ratio   Prob.

Between Groups   1   .7315   .7315   3.9154   .0479

Within Groups   2959   552.8133   .1868

Total   2960   553.5447

                                Standard   Standard
Group   Count   Mean   Deviation   Error   95 Pct Conf Int for Mean

  Female   1354   .2304   .4213   .0114   .2080   To   .2529
  Male   1607   .2620   .4413   .0110   .2404   To   .2836

Total   2961   .2476   .4324   .0079   .2320   To   .2631

Group   Minimum   Maximum

  Female   .0000   1.0000
  Male   .0000   2.0000

Total   .0000   2.0000

No Range Tests performed with fewer than three non-empty groups.

- - - - - - - - - - O N E W A Y - - - - - - - - - - -

        Variable PROM   Nr. of prominences
    By Variable SEX   Sex

                          Analysis of Variance

                              Sum of   Mean   F   F
            Source   D.F. Squares   Squares   Ratio Prob.

Between Groups   1   .0347   .0347   .0912 .7626

Within Groups   2959   1124.1963   .3799

Total   2960   1124.2310

                          Standard   Standard
Group   Count   Mean Deviation   Error   95 Pct Conf Int for Mean

  Female   1354   1.4586   .6283   .0171   1.4251 To   1.4921
  Male   1607   1.4518   .6061   .0151   1.4221 To   1.4814

Total   2961   1.4549   .6163   .0113   1.4327 To   1.4771

Group   Minimum   Maximum

  Female   1.0000   4.0000
  Male   1.0000   4.0000

Total   1.0000   4.0000

No Range Tests performed with fewer than three non-empty groups.

- - - - - - - - - - - O N E W A Y - - - - - - - - - - - -

        Variable   WORD   Nr. of words
      By Variable INFO   Number of informant

                              Analysis of Variance

                              Sum of   Mean   F   F
            Source   D.F.   Squares   Squares   Ratio   Prob.

Between Groups   9   159.6712   17.7412   11.1538   .0000

Within Groups   3210   5105.8493   1.5906

Total   3219   5265.5205

                                 Standard   Standard
Group   Count   Mean   Deviation   Error   95 Pct Conf Int for Mean

Inf. # 0   275   2.1418   1.3447   .0811   1.9822 To   2.3015
Inf. # 1   249   1.8554   1.2649   .0802   1.6975 To   2.0133
Inf. # 2   302   1.7020   .9768   .0562   1.5914 To   1.8126
Inf. # 3   355   1.9493   1.1609   .0616   1.8281 To   2.0705
Inf. # 4   278   2.4065   1.3610   .0816   2.2458 To   2.5672
Inf. # 5   361   2.4404   1.5501   .0816   2.2800 To   2.6009
Inf. # 6   360   2.0889   1.2255   .0646   1.9619 To   2.2159
Inf. # 7   347   2.3314   1.3222   .0710   2.1918 To   2.4710
Inf. # 8   325   2.0215   1.1478   .0637   1.8963 To   2.1468
Inf. # 9   368   2.0842   1.1677   .0609   1.9645 To   2.2039

Total   3220   2.1093   1.2790   .0225   2.0651 To   2.1535

Group   Minimum   Maximum

Inf. # 0   1.0000   8.0000
Inf. # 1   1.0000   8.0000
Inf. # 2   1.0000   6.0000
Inf. # 3   1.0000   6.0000
Inf. # 4   1.0000   9.0000
Inf. # 5   1.0000   8.0000
Inf. # 6   1.0000   7.0000
Inf. # 7   1.0000   7.0000
Inf. # 8   1.0000   7.0000
Inf. # 9   1.0000   7.0000

Total   1.0000   9.0000

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        Variable SYLL   Nr. of syllables
     By Variable INFO   Number of informant

                        Analysis of Variance

                                 Sum of   Mean   F   F
            Source   D.F.   Squares   Squares   Ratio Prob.

Between Groups   9   342.5535   38.0615   10.7150 .0000

Within Groups   3210   11402.4959   3.5522

Total   3219   11745.0494

                              Standard   Standard
Group   Count   Mean   Deviation   Error   95 Pct Conf Int for Mean

Inf. # 0   275   2.8400   2.0244   .1221   2.5997 To   3.0803
Inf. # 1   249   2.6867   1.9568   .1240   2.4425 To   2.9310
Inf. # 2   302   2.3510   1.4995   .0863   2.1812 To   2.5208
Inf. # 3   355   2.5915   1.7188   .0912   2.4121 To   2.7710
Inf. # 4   278   3.2482   1.9616   .1176   3.0166 To   3.4798
Inf. # 5   361   3.3906   2.4094   .1268   3.1412 To   3.6400
Inf. # 6   360   2.6278   1.7281   .0911   2.4487 To   2.8069
Inf. # 7   347   3.2392   2.0366   .1093   3.0242 To   3.4542
Inf. # 8   325   2.8031   1.8014   .0999   2.6065 To   2.9997
Inf. # 9   368   2.6386   1.5598   .0813   2.4787 To   2.7985

Total   3220   2.8444   1.9101   .0337   2.7784 To   2.9104

Group   Minimum   Maximum

Inf. # 0   1.0000   13.0000
Inf. # 1   1.0000   10.0000
Inf. # 2   1.0000   9.0000
Inf. # 3   1.0000   9.0000
Inf. # 4   1.0000   10.0000
Inf. # 5   1.0000   13.0000
Inf. # 6   1.0000   9.0000
Inf. # 7   1.0000   12.0000
Inf. # 8   1.0000   12.0000
Inf. # 9   1.0000   11.0000

Total   1.0000   13.0000

- - - - - - - - - - O N E W A Y - - - - - - - - - -

           Variable   NRTU   Nr. of tone units
        By Variable   TIME   Interview

                              Analysis of Variance

                                  Sum of   Mean   F   F
            Source   D.F.   Squares   Squares   Ratio   Prob.

Between Groups   1   1008109.644   1008109.644   693.1774 .0000

Within Groups   6189   9000856.830   1454.3314

Total   6190   10008966.47

                                      Standard   Standard
Group   Count   Mean   Deviation   Error   95 Pct Conf Int for Mean

 First   2971   301.6375   36.8811   .6766   300.3108 To   302.9642
 Second   3220   327.1795   39.2577   .6918   325.8230 To   328.5360

Total   6191   314.9221   40.2114   .5111   313.9203 To   315.9240

Group   Minimum   Maximum

 First   245.0000   361.0000
 Second   249.0000   368.0000

Total   245.0000   368.0000

No Range Tests performed with fewer than three non-empty groups.

- - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable   SYLL   Nr. of syllables
By Variable   TIME   Interview

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	3.6171	3.6171	1.0322	.3097
Within Groups	6189	21687.4425	3.5042		
Total	6190	21691.0596			

Group	Count	Mean	Standard Deviation	Standard Error	95 Pct Conf Int for Mean		
First	2971	2.7960	1.8296	.0336	2.7302	To	2.8618
Second	3220	2.8444	1.9101	.0337	2.7784	To	2.9104
Total	6191	2.8212	1.8720	.0238	2.7746	To	2.8678

Group	Minimum	Maximum
First	1.0000	12.0000
Second	1.0000	13.0000
Total	1.0000	13.0000

No Range Tests performed with fewer than three non-empty groups.

- - - - - - - - - - O N E W A Y - - - - - - - - - - -

        Variable WPWS   Nr. of wrong placed word stresses
     By Variable TIME   Interview

                              Analysis of Variance

                              Sum of   Mean   F   F
            Source   D.F.   Squares   Squares   Ratio Prob.

Between Groups   1   .0105   .0105   .1726 .6778

Within Groups   5613   342.9084   .0611

Total   5614   342.9190

                              Standard   Standard
Group   Count   Mean Deviation   Error   95 Pct Conf Int for Mean

 First   2654   .0656   .2506   .0049   .0560 To   .0751
 Second   2961   .0628   .2441   .0045   .0540 To   .0716

Total   5615   .0641   .2471   .0033   .0576 To   .0706

Group   Minimum   Maximum

 First   .0000   2.0000
 Second   .0000   2.0000

Total   .0000   2.0000

No Range Tests performed with fewer than three non-empty groups.

- - - - - - - - - O N E W A Y - - - - - - - - - -

        Variable   WPPS   Nr. of wrong placed prominent syllables
      By Variable TIME   Interview

                            Analysis of Variance

                                    Sum of   Mean   F   F
            Source   D.F.   Squares   Squares   Ratio Prob.

Between Groups   1   .0005   .0005   .0016 .9678

Within Groups   5613   1569.9094   .2797

Total   5614   1569.9099

                                Standard   Standard
Group   Count   Mean   Deviation   Error   95 Pct Conf Int for Mean

 First   2654   .3561   .5283   .0103   .3360   To   .3762
 Second   2961   .3566   .5293   .0097   .3376   To   .3757

Total   5615   .3564   .5288   .0071   .3425   To   .3702

Group   Minimum   Maximum

 First   .0000   3.0000
 Second   .0000   4.0000

Total   .0000   4.0000

No Range Tests performed with fewer than three non-empty groups.

- - - - - - - - - O N E W A Y - - - - - - - - - -

        Variable WPTS   Nr. of wrong placed tonic syllables
     By Variable TIME   Interview

                        Analysis of Variance

                              Sum of   Mean   F   F
            Source   D.F.   Squares   Squares   Ratio Prob.

Between Groups   1   .9460   .9460   5.2405 .0221

Within Groups   5613   1013.2720   .1805

Total   5614   1014.2180

                            Standard   Standard
Group   Count   Mean Deviation   Error   95 Pct Conf Int for Mean

  First   2654   .2216   .4163   .0081   .2057 To   .2374
  Second   2961   .2476   .4324   .0079   .2320 To   .2631

Total   5615   .2353   .4250   .0057   .2241 To   .2464

Group   Minimum   Maximum

  First   .0000   2.0000
  Second   .0000   2.0000

Total   .0000   2.0000

No Range Tests performed with fewer than three non-empty groups.

- - - - - - - - - O N E W A Y - - - - - - - - - -

        Variable   PROM   Nr. of prominences
     By Variable   TIME   Interview

                            Analysis of Variance

                                Sum of   Mean   F   F
            Source   D.F.   Squares   Squares   Ratio Prob.

Between Groups   1   .6085   .6085   1.6126 .2042

Within Groups   5613   2118.1918   .3774

Total   5614   2118.8004

                                Standard   Standard
Group   Count   Mean   Deviation   Error   95 Pct Conf Int for Mean

  First   2654   1.4341   .6121   .0119   1.4108 To   1.4574
  Second   2961   1.4549   .6163   .0113   1.4327 To   1.4771

Total   5615   1.4451   .6143   .0082   1.4290 To   1.4611

Group   Minimum   Maximum

  First   1.0000   4.0000
  Second   1.0000   4.0000

Total   1.0000   4.0000

No Range Tests performed with fewer than three non-empty groups.

- - - - - - - - - - O N E W A Y - - - - - - - - - - -

         Variable   NRTU   Nr. of tone units
        By Variable TIME   Interview

                            Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	386518.5405	386518.5405	396.5777	.0000
Within Groups	2811	2739699.149	974.6351		
Total	2812	3126217.689			

Group	Count	Mean	Standard Deviation	Standard Error	95 Pct Conf Int for Mean		
First	1354	272.7282	23.2556	.6320	271.4884	To	273.9680
Second	1459	296.1885	37.1107	.9716	294.2827	To	298.0943
Total	2813	284.8962	33.3428	.6287	283.6635	To	286.1289

Group	Minimum	Maximum
First	245.0000	308.0000
Second	249.0000	355.0000
Total	245.0000	355.0000

No Range Tests performed with fewer than three non-empty groups.

- - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable   WORD   Nr. of words
By Variable TIME   Interview

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	.5700	.5700	.3773	.5391
Within Groups	2811	4246.3934	1.5106		
Total	2812	4246.9634			

Group	Count	Mean	Standard Deviation	Standard Error	95 Pct Conf Int for Mean		
First	1354	2.0340	1.2135	.0330	1.9693	To	2.0987
Second	1459	2.0055	1.2434	.0326	1.9416	To	2.0693
Total	2813	2.0192	1.2289	.0232	1.9738	To	2.0646

Group	Minimum	Maximum
First	1.0000	9.0000
Second	1.0000	9.0000
Total	1.0000	9.0000

No Range Tests performed with fewer than three non-empty groups.

- - - - - - - - - - O N E W A Y - - - - - - - - - -

        Variable SYLL   Nr. of syllables
     By Variable TIME   Interview

                           Analysis of Variance

	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	.7536	.7536	.2327	.6296
Within Groups	2811	9103.4504	3.2385		
Total	2812	9104.2041			

Group	Count	Mean	Standard Deviation	Standard Error	95 Pct.Conf Int for Mean		
First	1354	2.6972	1.7437	.0474	2.6042	To	2.7902
Second	1459	2.7300	1.8499	.0484	2.6349	To	2.8250
Total	2813	2.7142	1.7993	.0339	2.6477	To	2.7807

Group	Minimum	Maximum
First	1.0000	12.0000
Second	1.0000	13.0000
Total	1.0000	13.0000

No Range Tests performed with fewer than three non-empty groups.

- - - - - - - - - - O N E W A Y - - - - - - - - - - -

           Variable   WPWS   Nr. of wrong placed word stresses
        By Variable   TIME   Interview

                        Analysis of Variance

		Sum of	Mean	F	F
Source	D.F.	Squares	Squares	Ratio	Prob.
Between Groups	1	.0288	.0288	.4831	.4871
Within Groups	2570	153.1419	.0596		
Total	2571	153.1707			

Group	Count	Mean	Standard Deviation	Standard Error	95 Pct Conf Int for Mean		
First	1218	.0583	.2379	.0068	.0449	To	.0717
Second	1354	.0650	.2496	.0068	.0517	To	.0783
Total	2572	.0618	.2441	.0048	.0524	To	.0713

Group	Minimum	Maximum
First	.0000	2.0000
Second	.0000	2.0000
Total	.0000	2.0000

No Range Tests performed with fewer than three non-empty groups.

- - - - - - - - - - O N E W A Y - - - - - - - - - - -

        Variable   WPPS   Nr. of wrong placed prominent syllables
     By Variable   TIME   Interview

                            Analysis of Variance

                                 Sum of   Mean   F   F
             Source   D.F.   Squares   Squares   Ratio Prob.

Between Groups   1   .1035   .1035   .3484 .5551

Within Groups   2570   763.3223   .2970

Total   2571   763.4257

                              Standard   Standard
Group   Count   Mean   Deviation   Error   95 Pct Conf Int for Mean

 First   1218   .3662   .5353   .0153   .3361 To   .3963
 Second   1354   .3789   .5536   .0150   .3494 To   .4084

Total   2572   .3729   .5449   .0107   .3518 To   .3939

Group   Minimum   Maximum

 First   .0000   3.0000
 Second   .0000   4.0000

Total   .0000   4.0000

No Range Tests performed with fewer than three non-empty groups.

- - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable   WPTS   Nr. of wrong placed tonic syllables
By Variable TIME   Interview

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	1.2446	1.2446	7.4944	.0062
Within Groups	2570	426.8001	.1661		
Total	2571	428.0447			

Group	Count	Mean	Standard Deviation	Standard Error	95 Pct Conf Int for Mean		
First	1218	.1864	.3917	.0112	.1644	To	.2084
Second	1354	.2304	.4213	.0114	.2080	To	.2529
Total	2572	.2096	.4080	.0080	.1938	To	.2253

Group	Minimum	Maximum
First	.0000	2.0000
Second	.0000	1.0000
Total	.0000	2.0000

No Range Tests performed with fewer than three non-empty groups.

- - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable PROM   Nr. of prominences
By Variable TIME   Interview

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	.0924	.0924	.2373	.6262
Within Groups	2570	1001.2151	.3896		
Total	2571	1001.3075			

Group	Count	Mean	Standard Deviation	Standard Error	95 Pct Conf Int for Mean		
First	1218	1.4466	.6195	.0178	1.4118	To	1.4815
Second	1354	1.4586	.6283	.0171	1.4251	To	1.4921
Total	2572	1.4530	.6241	.0123	1.4288	To	1.4771

Group	Minimum	Maximum
First	1.0000	4.0000
Second	1.0000	4.0000
Total	1.0000	4.0000

No Range Tests performed with fewer than three non-empty groups.

- - - - - - - - - - O N E W A Y - - - - - - - - - - -

```
        Variable  NRTU      Nr. of tone units
     By Variable  TIME      Interview
```

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	615022.0956	615022.0956	1281.8771	.0000
Within Groups	3376	1619745.402	479.7824		
Total	3377	2234767.498			

Group	Count	Mean	Standard Deviation	Standard Error	95 Pct Conf Int for Mean		
First	1617	325.8448	27.5769	.6858	324.4996	To	327.1899
Second	1761	352.8558	14.9012	.3551	352.1593	To	353.5522
Total	3378	339.9260	25.7247	.4426	339.0582	To	340.7938

Group	Minimum	Maximum
First	278.0000	361.0000
Second	325.0000	368.0000
Total	278.0000	368.0000

No Range Tests performed with fewer than three non-empty groups.

- - - - - - - - - - O N E W A Y - - - - - - - - - - -

        Variable   WORD   Nr. of words
     By Variable   TIME   Interview

                            Analysis of Variance

                                    Sum of   Mean   F   F
            Source   D.F.   Squares   Squares   Ratio Prob.

Between Groups   1   12.6227   12.6227   7.9147 .0049

Within Groups   3376   5384.1908   1.5948

Total   3377   5396.8135

                                    Standard   Standard
Group   Count   Mean   Deviation   Error ___95 Pct Conf Int for Mean

 First   1617   2.0730   1.2190   .0303   2.0135 To   2.1324
 Second   1761   2.1953   1.3018   .0310   2.1345 To   2.2562

Total   3378   2.1368   1.2642   .0218   2.0941 To   2.1794

Group   Minimum   Maximum

 First   1.0000   9.0000
 Second   1.0000   8.0000

Total   1.0000   9.0000

No Range Tests performed with fewer than three non-empty groups.

- - - - - - - - - - O N E W A Y - - - - - - - - - -

        Variable WPWS   Nr. of wrong placed word stresses
     By Variable TIME   Interview

                        Analysis of Variance

		Sum of	Mean	F	F
Source	D.F.	Squares	Squares	Ratio	Prob.
Between Groups	1	.0875	.0875	1.4037	.2362
Within Groups	3041	189.6358	.0624		
Total	3042	189.7233			

			Standard	Standard	
Group	Count	Mean	Deviation	Error	95 Pct Conf Int for Mean

- - - - - - - - - - O N E W A Y - - - - - - - - - -

- - - - - - - - - - O N E W A Y - - - - - - - - - - -

        Variable   WPPS   Nr. of wrong placed prominent syllables
    By Variable   TIME   Interview

                              Analysis of Variance

                                   Sum of   Mean   F   F
            Source   D.F.   Squares   Squares   Ratio Prob.

Between Groups   1   .0698   .0698   .2638 .6076

Within Groups   3041   805.1231   .2648

Total   3042   805.1929

                                     Standard   Standard
Group   Count   Mean   Deviation   Error   95 Pct Conf Int for Mean

  First   1436   .3475   .5224   .0138   .3205   To   .3745
  Second   1607   .3379   .5074   .0127   .3131   To   .3627

Total   3043   .3424   .5145   .0093   .3241   To   .3607

Group   Minimum   Maximum

  First   .0000   3.0000
  Second   .0000   2.0000

Total   .0000   3.0000

No Range Tests performed with fewer than three non-empty groups.

- - - - - - - - - O N E W A Y - - - - - - - - - -

            Variable   WPTS   Nr. of wrong placed tonic syllables
         By Variable   TIME   Interview

                              Analysis of Variance

                                 Sum of   Mean   F   F
              Source   D.F.   Squares   Squares   Ratio Prob.

Between Groups   1   .0850   .0850   .4433 .5056

Within Groups   3041   582.9541   .1917

Total   3042   583.0391

                            Standard   Standard
Group   Count   Mean Deviation   Error   95 Pct Conf Int for Mean

  First   1436   .2514   .4340   .0115   .2289 To   .2739
  Second   1607   .2620   .4413   .0110   .2404 To   .2836

Total   3043   .2570   .4378   .0079   .2414 To   .2725

Group   Minimum   Maximum

  First   .0000   1.0000
  Second   .0000   2.0000

Total   .0000   2.0000

No Range Tests performed with fewer than three non-empty groups.

- - - - - - - - - - O N E W A Y - - - - - - - - - - -

        Variable   PROM   Nr. of prominences
     By Variable   TIME   Interview

                            Analysis of Variance

                                Sum of   Mean   F   F
            Source   D.F.   Squares   Squares   Ratio   Prob.

Between Groups   1   .6106   .6106   1.6629   .1973

Within Groups   3041   1116.5863   .3672

Total   3042   1117.1968

                                Standard   Standard
Group   Count   Mean   Deviation   Error   95 Pct_Conf Int. for Mean

  First   1436   1.4234   .6058   .0160   1.3920   To   1.4548
  Second   1607   1.4518   .6061   .0151   1.4221   To   1.4814

Total   3043   1.4384   .6060   .0110   1.4168   To   1.4599

Group   Minimum   Maximum

  First   1.0000   4.0000
  Second   1.0000   4.0000

Total   1.0000   4.0000

No Range Tests performed with fewer than three non-empty groups.

APPENDIX

A - III

- Source pages
  Selected from
  Annex III

SET /SCREEN OFF /PRINTER ON .
INCLUDE 'iria.inc'.

TITLE   'Iria Werlang Garcia   *   PhD Thesis'.
SUBTITLE 'Data Analisis'.

data list file='iria.txt'
        /   id   1 -   7 (A)
            info   8
            sex   9
            time   10
            nrtu   11 - 13
            word   14 - 15
            syll   16 - 17
            wpws   18 - 19
            prom   20 - 21
            wpps   22
            wpts   23
            tone   24
            prop   25
            kt   26
            er   27.

var label   id   'Identification number'
            info   'Number of informant'
            sex   'Sex'
            time   'Interview'
            nrtu   'Nr. of tone units'
            word   'Nr. of words'
            syll   'Nr. of syllables'
            wpws   'Nr. of wrong placed word stresses'
            prom   'Nr. of prominences'
            wpps   'Nr. of wrong placed prominent syllables'
            wpts   'Nr. of wrong placed tonic syllables'
            tone   'Tone'
            prop   'Property of tone'
            kt   'Key and termination'
            er   'Vacilation'.

val label / info   0   'Inf. # 0'
                      1   'Inf. # 1'
                      2   'Inf. # 2'
                      3   'Inf. # 3'
                      4   'Inf. # 4'
                      5   'Inf. # 5'
                      6   'Inf. # 6'
                      7   'Inf. # 7'
                      8   'Inf. # 8'
                      9   'Inf. # 9'
          / sex   1   ' Female '
                      2   ' Male '
          / time   1   ' First '
                      2   ' Second '
          / tone   1   '   P   '
                      2   '   R   '

```
                        3    '   P+   '
                        4    '   R+   '
                        5    '   O    '
                        6    '   PO   '
                        7    '   I    '
        / prop          1    '   Odd  '
                        2    '   Unr  '
        / kt            1    '   HH   '
                        2    '   HM   '
                        3    '   HL   '
                        4    '   MH   '
                        5    '   MM   '
                        6    '   ML   '
                        7    '   LH   '
                        8    '   LM   '
                        9    '   LL   '
        / er            1    '   Yes  '
                        2    '   No   '  .

missing value prom(9) wpws(9) wpps(9) wpts(9) prop(9) kt(0) er(9).

*process if (sex eq 1).
CROSSTABS /TABLES tone prop kt er BY sex BY time
The raw data or transformation pass is proceeding
   6191 cases are written to the compressed active file.
          /CELLS       = COUNT ROW COLUMN
          /STATISTICS  = CHISQ.

Memory allows for 6,718 cells with 3 dimensions for general CROSSTABS.
```

TONE   Tone   by   SEX   Sex
Controlling for..
TIME   Interview   Value = 1   First

```
                      SEX           Page 1 of 1
             Count  |
             Row Pct | Female    Male
             Col Pct |                     Row
                     |     1  |      2  | Total
TONE       --------+--------+--------+
           1 |    587 |    679 |  1266
    P        |   46.4 |   53.6 |  42.6
             |   43.4 |   42.0 |
             +--------+--------+
           3 |      4 |      1 |     5
    P+       |   80.0 |   20.0 |    .2
             |    .3  |    .1  |
             +--------+--------+
           4 |    157 |    119 |   276
    R+       |   56.9 |   43.1 |   9.3
             |   11.6 |    7.4 |
             +--------+--------+
           5 |    440 |    617 |  1057
    O        |   41.6 |   58.4 |  35.6
             |   32.5 |   38.2 |
             +--------+--------+
           6 |     30 |     20 |    50
    PO       |   60.0 |   40.0 |   1.7
             |    2.2 |    1.2 |
             +--------+--------+
           7 |    136 |    181 |   317
    I        |   42.9 |   57.1 |  10.7
             |   10.0 |   11.2 |
             +--------+--------+
        Column    1354     1617    2971
         Total    45.6     54.4   100.0
```

Chi-Square	Value	DF	Significance
Pearson	28.68849	5	.00003
Likelihood Ratio	28.75857	5	.00003
Mantel-Haenszel test for linear association	1.97995	1	.15940

Minimum Expected Frequency -   2.279
Cells with Expected Frequency < 5 -   2 OF   12 (16.7%)

TONE   Tone by SEX   Sex
Controlling for..
TIME   Interview Value = 2   Second

```
                       SEX          Page 1 of 1
                Count  |
                Row Pct | Female    Male
                Col Pct |                    Row
                        |    1   |     2  | Total
TONE            --------+--------+--------+
                1  |   602  |   734  | 1336
       P           |  45.1  |  54.9  | 41.5
                   |  41.3  |  41.7  |
                   +--------+--------+
                3  |        |     2  |    2
       P+          |        | 100.0  |   .1
                   |        |    .1  |
                   +--------+--------+
                4  |   105  |   120  |  225
       R+          |  46.7  |  53.3  |  7.0
                   |   7.2  |   6.8  |
                   +--------+--------+
                5  |   620  |   723  | 1343
       O           |  46.2  |  53.8  | 41.7
                   |  42.5  |  41.1  |
                   +--------+--------+
                6  |    27  |    28  |   55
       PO          |  49.1  |  50.9  |  1.7
                   |   1.9  |   1.6  |
                   +--------+--------+
                7  |   105  |   154  |  259
       I           |  40.5  |  59.5  |  8.0
                   |   7.2  |   8.7  |
                   +--------+--------+
                Column  1459     1761     3220
                Total    45.3     54.7    100.0
```

Chi-Square	Value	DF	Significance
Pearson	4.94916	5	.42212
Likelihood Ratio	5.72253	5	.33416
Mantel-Haenszel test for linear association	.02962	1	.86335

Minimum Expected Frequency -   .906
Cells with Expected Frequency < 5 -   2 OF   12 (16.7%)

Number of Missing Observations: 0

PROP Property of tone by SEX Sex
Controlling for..
TIME Interview Value = 1   First

```
                     SEX         Page 1 of 1
              Count |
              Row Pct | Female    Male
              Col Pct |                    Row
                    |     1 |       2 | Total
PROP      --------+--------+--------+
              1 |   293 |    342 |   635
     Odd            |  46.1 |   53.9 |  23.9
                    |  24.1 |   23.8 |
                    +--------+--------+
              2 |   925 |   1094 |  2019
     Unr            |  45.8 |   54.2 |  76.1
                    |  75.9 |   76.2 |
                    +--------+--------+
           Column   1218    1436     2654
            Total   45.9    54.1    100.0
```

Chi-Square	Value	DF	Significance
Pearson	.02080	1	.88533
Continuity Correction	.00971	1	.92148
Likelihood Ratio	.02075	1	.88547
Mantel-Haenszel test for linear association	.02079	1	.88535

Minimum Expected Frequency - 291.421

PROP Property of tone by SEX Sex
Controlling for..
TIME Interview Value = 2   Second

```
                    SEX           Page 1 of 1
            Count  |
            Row Pct | Female    Male
            Col Pct |                      Row
                    |     1 |      2 | Total
PROP       --------+--------+--------+
                1 |   270 |   327 |   597
        Odd       |  45.2 |  54.8 |  20.2
                  |  19.9 |  20.3 |
                  +--------+--------+
                2 |  1084 |  1280 |  2364
        Unr       |  45.9 |  54.1 |  79.8
                  |  80.1 |  79.7 |
                  +--------+--------+
            Column   1354    1607    2961
            Total    45.7    54.3   100.0
```

Chi-Square	Value	DF	Significance
Pearson	.07583	1	.78303
Continuity Correction	.05262	1	.81856
Likelihood Ratio	.07588	1	.78296
Mantel-Haenszel test for linear association	.07580	1	.78307

Minimum Expected Frequency - 272.995

Number of Missing Observations: 576

KT Key and termination by SEX Sex
Controlling for..
TIME Interview Value = 1   First

```
                      SEX         Page 1 of 1
              Count  |
              Row Pct | Female    Male
              Col Pct |                     Row
                      |     1  |      2  |  Total
KT            --------+--------+--------+
              1  |      89  |   146  |   235
     HH          |    37.9  |  62.1  |   8.9
                 |     7.3  |  10.2  |
                 +--------+--------+
              2  |      71  |    85  |   156
     HM          |    45.5  |  54.5  |   5.9
                 |     5.8  |   5.9  |
                 +--------+--------+
              3  |       4  |     3  |     7
     HL          |    57.1  |  42.9  |    .3
                 |      .3  |    .2  |
                 +--------+--------+
              4  |      28  |    65  |    93
     MH          |    30.1  |  69.9  |   3.5
                 |     2.3  |   4.5  |
                 +--------+--------+
              5  |     892  |  1016  |  1908
     MM          |    46.8  |  53.2  |  71.9
                 |    73.2  |  70.8  |
                 +--------+--------+
              6  |      87  |    55  |   142
     ML          |    61.3  |  38.7  |   5.4
                 |     7.1  |   3.8  |
                 +--------+--------+
              9  |      47  |    66  |   113
     LL          |    41.6  |  58.4  |   4.3
                 |     3.9  |   4.6  |
                 +--------+--------+
          Column    1218     1436     2654
           Total    45.9     54.1    100.0
```

Chi-Square	Value	DF	Significance
Pearson	30.71054	6	.00003
Likelihood Ratio	31.12264	6	.00002
Mantel-Haenszel test for linear association	4.99965	1	.02535

Minimum Expected Frequency -   3.213
Cells with Expected Frequency < 5 -   2 OF   14 (14.3%)

KT Key and termination by SEX Sex
Controlling for..
TIME Interview Value = 2   Second

```
                    SEX          Page 1 of 1
            Count   |
            Row Pct | Female    Male
            Col Pct |                    Row
                    |    1   |     2   | Total
KT          --------+--------+---------+
            1   |    125  |   222   |   347
     HH         |   36.0  |  64.0   |  11.7
                |    9.2  |  13.8   |
                +--------+---------+
            2   |     96  |   141   |   237
     HM         |   40.5  |  59.5   |   8.0
                |    7.1  |   8.8   |
                +--------+---------+
            3   |      3  |     3   |     6
     HL         |   50.0  |  50.0   |    .2
                |     .2  |    .2   |
                +--------+---------+
            4   |     52  |    51   |   103
     MH         |   50.5  |  49.5   |   3.5
                |    3.8  |   3.2   |
                +--------+---------+
            5   |    964  |  1061   |  2025
     MM         |   47.6  |  52.4   |  68.4
                |   71.2  |  66.0   |
                +--------+---------+
            6   |     74  |    77   |   151
     ML         |   49.0  |  51.0   |   5.1
                |    5.5  |   4.8   |
                +--------+---------+
            9   |     40  |    52   |    92
     LL         |   43.5  |  56.5   |   3.1
                |    3.0  |   3.2   |
                +--------+---------+
        Column     1354     1607      2961
         Total     45.7     54.3     100.0
```

```
      Chi-Square                Value          DF          Significance
------------------------        ----------     ----        ------------

Pearson                         20.47263        6             .00228
Likelihood Ratio                20.71954        6             .00206
Mantel-Haenszel test for        12.65661        1             .00037
      linear association

Minimum Expected Frequency -    2.744
Cells with Expected Frequency < 5 -      2 OF    14 ( 14.3%)
```

ER Vacilation by SEX Sex
Controlling for..
TIME Interview Value = 1   First

```
                    SEX              Page 1 of 1
            Count  |
            Row Pct | Female    Male
            Col Pct |                     Row
                    |     1  |      2  | Total
ER          --------+--------+--------+
            1  |   115  |   120  |   235
    Yes        |  48.9  |  51.1  |  ·8.9
               |   9.4  |   8.4  |
            +--------+--------+
            2  |  1103  |  1316  |  2419
    No         |  45.6  |  54.4  |  91.1
               |  90.6  |  91.6  |
            +--------+--------+
        Column    1218     1436     2654
         Total    45.9     54.1    100.0
```

Chi-Square	Value	DF	Significance
Pearson	.96159	1	.32679
Continuity Correction	.83183	1	.36175
Likelihood Ratio	.95927	1	.32737
Mantel-Haenszel test for linear association	.96122	1	.32688

Minimum Expected Frequency - 107.849

ER Vacilation by SEX Sex
Controlling for..
TIME Interview Value = 2   Second

```
                    SEX              Page 1 of 1
            Count  |
      \     Row Pct | Female    Male
            Col Pct |                      Row
                   |      1  |       2  | Total
ER          --------+--------+--------+
            1  |    128  |    121  |   249
      Yes        |   51.4  |   48.6  |   8.4
                 |    9.5  |    7.5  |
                 +--------+--------+
            2  |   1226  |   1486  |  2712
      No         |   45.2  |   54.8  |  91.6
                 |   90.5  |   92.5  |
                 +--------+--------+
           Column    1354     1607    2961
            Total    45.7     54.3   100.0
```

Chi-Square	Value	DF	Significance
Pearson	3.53147	1	.06021
Continuity Correction	3.28609	1	.06987
Likelihood Ratio	3.51763	1	.06072
Mantel-Haenszel test for linear association	3.53027	1	.06026

Minimum Expected Frequency - 113.862

Number of Missing Observations: 576