



## **Finnish-English Phonetics and Phonology**

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### **ABSTRACT**

This paper first gives a **summary** of the theoretical approaches to the role of phonetics and phonology in language **learning** and teaching as developed by the Finnish-English Cross-Language Project at the University of Jyväskylä. In the Finnish project, the analysis was extended over the chains of connected speech to **deal** with **all** the phenomena that give them their rhythm in speech. The project did not find it sufficient to produce simple one-to-one equations between the best structural descriptions of the two languages **because** many of **learners' difficulties** in pronunciation cannot be assigned to phoneme paradigms. The paper also includes a **survey** of the findings of Finnish-English contrastive phonetics and phonology, and a description of potential **sources** of difficulties in Finns' pronunciation of English.

**KEYWORDS:** contrastive phonetics, contrastive phonology, pronunciation, prosody, stress, speech rhythm, speech rate, fluency, speech perception, error analysis

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## I. INTRODUCTION

Languages sound different **because** they **have** specific phonetic structures of their own. Many of these differences in phonetic structures are **known** to be cumbersome for language learners: it may be a foreign or **unusual** sound, a strange combination of sounds, or certain aspects of speech rhythm, stress patterning, or intonation that are problematic.

Even greater problems may be involved for language teachers, **because** it is not possible to give instructions, by means of straightforward **reference** to traditional phonetic descriptions, as to how to correct misguided pronunciation. Direct use of phonetic descriptions **easily** results in inaccurate and erroneous assessments of pronunciation or futile attempts to correct deviations detected. Teachers must be able to analyze utterances and break them **up** into their constituent particles at different levels of linguistic description, and they must **also** be acquainted with the structural similarities and differences between the native language of the learners and the foreign language. They must **also know** which the most common errors are and what the causes of them are. Only then can they diagnose various phenomena in the foreign language and analyze errors in **pronunciation**. This is a prerequisite for proper error correction. Teachers **also** need this kind of information to be able to plan their teaching to **make** it possible for learners to avoid the most obvious mispronunciations.

Below we will **first** discuss the role of phonetics and phonology in language learning and teaching and the theoretical approaches to contrastive **analysis** developed by the Finnish-English Cross-Language Project at the University of Jyväskylä. This discussion will be followed by a **summary** of the research work in the area of Finnish-English contrastive phonetics.

## II. THE ROLE OF PHONETICS AND PHONOLOGY IN LANGUAGE LEARNING AND TEACHING

The term 'phonology' refers to the patterns of phonetic elements used in the phonological forms of meaningful **entities** of a language. These elements, ie. phonemes, are abstractions and **have** no **content**. They are described in opposition to each other: change of a phoneme in a word creates a different word (eg. /kæp tæp læp/).

Errors in **pronunciation** can be either allophonic or phonological. When, for **instance**, the word **pit** is perceived as **bit** by the listener, the error is phonological; when the word **drill** is pronounced with the clear /l/ instead of the dark, the word can be perceived correctly and the error is allophonic. Individual phonological errors, like the one above, do not **very** often occur in real conversation, **because** the redundancy embedded in the context makes it possible for listeners to amend what they hear.

The importance of phoneme contrasts is **often** overemphasized in teaching at the cost of some other, more important aspects of phonology. Phenomena that are important to learn are, for **instance**, "the way in which the foreign language links phonemes together, physically carries out sequences of sounds in stressed and unstressed positions in connected speech, shapes words and builds up word combinations, and gives them their rhythm in sentences and longer stretches of discourse" (Lehtonen et al. 1977: 9-10).

The phoneme paradigm constituting the phonological system of a given language makes part of the native speaker's competence. It makes it possible for him to expect certain types of constructions and recognize certain physical differences of sounds. The phonemic system of the language **also** allows the speaker-hearer to subconsciously overlook differences and constructions that could be predicted theoretically. There is a great **deal** of redundancy as a result of the phonological rules and rules of **grammar** as well as **various** constraints that are imposed on the exchange of messages. This redundancy is an unavoidable **feature** of **all** natural communication. It is for this reason that it is not possible to evaluate the importance of individual phonological oppositions.

Interpretation of an utterance calls for the processing of phonemic, syntactic, and semantic cues of perception. The information contained **in** the perceptual auditory input can only be used properly if the units signalled by the sound waves in speech are familiar. Lehtonen (Lehtonen et al. 1977:10-12) has compared the functioning of the phonological **structure** of languages to the game of chess: The chess pieces could be of any shape as long as they are identifiable and different from each other. The shapes of the pieces **have** no bearing on the rules of the game; only the rules that govern their conduct are important, not their **external** appearance. The chess player has to learn to recognize the chess pieces by their outward characteristics but **also have** access to the rules that govern their conduct on the chessboard. **>From** very early on in our childhood, we learn to play a certain type of game on a board that resembles a chessboard. **Later** on, if we are supposed to be acquiring a new game to be played on the same board, we easily confuse the unfamiliar pieces of the new game with those of the original one. We **also** tend to move the pieces according to the rules of the original game and **judge** and interpret the opponent's moves and the ensuing situation on the board in terms of the rules of the original game.

For the purposes of speech communication, we **have** to be able to produce the pieces we want to move each time we intend to make moves. If we do not know the pieces used in the game, we cannot interpret the moves of our opponent, even if we know the rules of the game; if we are not acquainted with the rules of the game, recognition of the pieces is not sufficient; if the shape of the pieces that we use makes it impossible for the opponent to recognize our moves, the opponent will find it difficult to grasp the meaning of our intention in the game. In the game of speech communication two or more people make moves in **response** to those of the interlocutor. It is important for both **parties** to understand what the fellow speaker is aiming at.

But there is a striking difference between chess and speech game: the purpose of speech

game is not to checkmate the opponent. "A seasoned player —**the** native speaker — can easily see what is meant even when the moves are faulty as long as the pieces used can be recognized" (Lehtonen et al. 1977:12). The native speaker can make use of **all** of the redundancy available in the language. A language learner is in a much more problematic situation: he must necessarily learn to understand what the native speaker says, **because** the native speaker can only marginally, and for short periods of time, change the way he speaks and in this way make more understandable what he says. It is practically impossible for him to produce the kind of changes that would make his speech sound faulty 'in the right way' for the non-native speaker to understand him. In ordinary everyday communicative situations it is practically impossible for a foreign speaker of English to influence the rate or **quality** of what a native speaker says.

**Here we have** the reason why one of the most significant skills **is** that of listening comprehension, especially at the phonemic level. The ability to extract the phonological structure of a chain of speech from what **is** heard **is** an integral element in the 'the process of understanding'. In the **studies** of the difficulties experienced by Finnish-speaking and Swedish-speaking students **in** the learning of English, **it was** found out that the Finnish-speaking Finns scored distinctively poorer in listening comprehension tests, while in pronunciation tests, for example, no such difference was found (Ringbom 1987:3). This can be explained by the fact that native speakers of Swedish, a language historically related to Swedish, can make use of certain information in English input on the basis of their experience with their **own** native language. **Because** of the complexity of the phenomena related to reception, materials are needed for language teaching that include exercises which are not based on simplified phonological descriptions. Such descriptions may possibly be sufficient for productive skills.

**Difficulties** in the learning of pronunciation arise from two **major** sources: (1) actual production of English sounds, eg. [ɔ] or [θ], by means of the correct articulatory processes, and (2) interrelationship between the written forms of words and their equivalents in spoken English. In this way, errors in pronunciation may be either errors in how a sound is pronounced, or errors resulting from misguided interpretation of the pronunciation of written words.

An example of the latter kind of problem **is** the pronunciation of the word *bosom* as [bɔzəm] instead [buzam]. The wrong pronunciation arises from the spelling of the word, but the error **is** morphophonetic: the morpheme {bosom} is given the wrong phonological form [bɔzəm]. Errors of the **same** kind can **also** be found in the **area** of word stress when the stress **is** assigned to a wrong syllable as in *\*inte'resting* or *\*sub'sequent*.

Correctness of pronunciation **cannot** always be easily assessed. Pronunciation errors **become** a real problem when they **have** an impact on the comprehensibility of the message or when they **irritate** the listener. Attempts **have been** made to grade errors in this respect (Johansson 1975). In language teaching, the situation is complicated by the fact that non-native teachers and native teachers evaluate errors differently: for **instance**, many foreign **features** of Finnish English that are noticed without exception by a native speaker remain systematically **unheard** by a Finnish teacher. **Here** we are not concerned with the characteristics of sounds only;

various elements in prosody, **rhythm**, intonation, pitch, and voice **quality** join in.

Pronunciation teaching has traditionally **been** concerned with the acceptable production of speech sounds. In communicative interaction, the roles of the speaker and the hearer alternate, and it may be more often the case that the communicative performance fails **because** of the hearer's inability to understand what the other **party** is saying. An idealised model of native speaker speech performance based on an approximation of received pronunciation (RP) is not **sufficient** for the teaching of receptive skills, **because** only a minority of native speakers of English use this **variety** and non-native speakers with different language backgrounds **have** accents of their **own**: there is a **great deal** of variation among native speakers of English, and there are not many who speak the way in which the language is described in textbooks. In this respect, pronunciation differs from morphology, syntax, and semantics, where it is mostly possible to **tell** what is acceptable. A certain **part** of what a non-native speaker says may sound strange to a native speaker, but he cannot often be **sure** whether it is really wrong or why it sounds strange.

Moreover, natural **features** of a fluent speech chain are mostly disguised by an unnaturally slow spoken form of RP. In natural varieties of speech, in any language, the speech chain includes a large number of simplifications and deletions, which make the chain divert from its ideal phonological representation.

It is an interesting aspect of human communicative interaction that what **is** included in the linguistic **code** may be seriously distorted phonologically but it still remains intelligible. As was pointed out above, the phonological representation is not sufficient alone for the interpretation of the message. Interpretation of messages is based on a complex of phonological, syntactic, semantic, and pragmatic cues embedded in the message and various sociolinguistic, situational, and personal information as well as **varying** amounts of experience and world knowledge. Production and reception are not **reverse** processes, **mere** mirror images of each other: perception of a chain of speech actually means parallel construction of what there is in the speaker's utterance by means of **all** available cues, linguistic and non-linguistic. If persons, such as married couples, who are interacting with each other **have** a **great deal** of common experience with mutual interactive situations, they often can extensively predict each other's **interventions**.

Non-native speakers are handicapped by the fact that they **have** to pay a **great deal** of attention to the **surface** phenomena of their speech production and speech reception. This means that they often sound too perfect. It takes a long time before learners gain the awareness as to when and where they can take liberties with the phenomena related to the chain of speech. It **also** requires a **great deal** of experience with actual situations where English is used in naturalistic communication before learners can tune themselves to the variety of cues that they need to be able to pick up the meaningful information and disregard those that are not necessary for correct interpretation.

### III. CONTRASTIVE ANALYSIS AND CONTRASTIVE PHONETICS

The phonological systems of two languages differ in a number of ways (Lehtonen et al. 1977:9, Wiik 1965, 1966). The difference is *physical* when certain target language speech sounds are physically new to a learner (e.g. the English /θ, ð/ are physically new to a Finn). The difference is *relational* when similar sounds in both languages are related to each other in a phonologically different way (e.g. [v] and [w] are allophones in Finnish, but in English they are different phonemes /v/ and /w/). When the distribution of similar sounds in both languages is not the same, the difference is *distributional* (in English the distribution of the dark allophone of /l/ is different from that of the Finnish /l/). A *difference in segmentation* occurs when phonetically similar fragments are found in both languages but they are segmented into phonemes in different ways (reduced vowels between consonants are in Finnish perceived as belonging, in a way, to the consonant segments, while in English they are perceived as vocalic ones, Fi [siliman] <silman> 'of the eye' vs. E [sili maen] <silly man>).

As is obvious on the basis of what has been said above, however, the contrasting of two languages cannot be a simple one-to-one equation between the best possible structural descriptions of the two, if we want to produce material for the purposes of language learning and teaching. There is a very obvious reason for this: many of the difficulties in language learning and language use in the area of pronunciation cannot be accredited to phoneme paradigms. What is necessary for us to be able to explain the reasons for the difficulties is a more profound view of language reception and production and of the actual operations that are needed when speakers are faced with the need to produce or receive chains of speech. Within this kind of approach, contrastive linguistics means the study of how people communicate in two or more languages and what the consequences are for language learners and foreign language users when the systems of the languages clash in foreign language learning situations or situations of foreign language use.

Most of the criticism of contrastive analysis has been concerned with its inability to meet its non-theoretical objectives (Lehtonen & Sajavaara 1984:86). This does not mean that the idea of contrasting languages for the purposes of language teaching is wrong. It is just that an analysis of parameters that are linguistic in the narrow sense of the term is not sufficient for the study of problems which involve a large number of elements that are not linguistic. As was pointed out very early by Fisiak (1971), products of theoretical contrastive analysis need not necessarily be applicable for practical purposes. In contrastive phonology in particular, most of the research has been concerned with linguistic entities such as distinctive features and segmentable elements of the speech chain, while in many cases the learner's problems lie elsewhere.

In addition to the linguistic codes being assigned their proper locations in the communicative processes across the languages to be studied, attention will have to be paid to the mapping of similarities and differences in the processes of communication, in the rules of

interaction, and in the use of non-verbal means of communication in the two sociocultural settings. In this way the analysis reaches well beyond the confines of grammatical structures (including those of phonology) to deal with the ways in which messages are conveyed through the chains of communication in two or more languages.

The problem with grammars is that they are descriptions of structures and not of processes, while communicative interaction involves language in action, that is, processes which are language-bound. A phonological rule, irrespective of the theoretical approach adopted, describes a certain regularity in the structure of a language. It cannot be taken to be a model of the actual processes taking place in the nervous system of the language user. This is the basic reason why phonological rules cannot be used exclusively to predict all interference phenomena resulting from the collision of two languages in action. This does not mean that all previous work on misperceptions and problems of acquisition on the basis of traditional analyses of structures in two languages is useless or wrong: it is simply insufficient as a method to be used in the comparison of the entire systems of the languages and for the establishment of the actual contact between the systems. The phenomena that we are dealing with are dynamic (Sajavaara & Lehtonen 1980), and these dynamic phenomena do not take place in the structures but *in the nervous system of the language user* (in the 'mind' of the user).

Lehtonen and Sajavaara (1984:88) abstract a certain number of principles that can be used to find out whether a phoneme in one language is equivalent to a phoneme in another: coGENCY of similar letters; similarity of phonetic descriptions and conventions of transcriptions; use of phonological criteria; and perceptual similarity. They point out that all of these must be used to explain phenomena of a contrastive character, but they end up emphasizing the importance of perceptual processes, "the mechanism which is used to transform the linguistic information of the phonological segment string into the actual speech signal and the mechanism which is used by the listener to detect the corresponding phonological information".

One of the problems in the analysis of processes is the fact that the recognition and production of speech sounds do not proceed lineally from phone to phone. The cues necessary for the identification of single phones are spread out over a number of acoustic segments or a single segment can bear the cues for several successive segments. Detection of phonetic properties may also depend on higher-level constructs such as syllables and entire word structures. There is also evidence of retroactive reworking effects: information coming up later in the chain of speech is used to reorganize the information that has been received earlier. A fair amount of incoming information is received as percept skeletons which serve as "direct input to the lexical access and to the parallel phonological identification process" (Lehtonen & Sajavaara 1984:90-91). What this means is that the 'phonological' elements are established, 'heard', after the lexical elements have already been detected, and what enters the language user's awareness largely resembles the elements in the written variety of the language, i.e. sequences of words.

In normal fluent speech perception, **lexical** items are identified directly on the basis of acoustic cue information. If, however, the word is difficult, the identification proceeds via phonological categorization. Thus, in fluent perception the identification of the phonological form of the input signal is an auxiliary strategy which is automatically available if the cue **pattern** embedded in the input signal matches no items in the memory as activated in the context and the grammatical and other constraints derived from the preceding structures **and** discourse history. Phonological mediation is **also** needed in the recognition process in **instances** in which morphological decomposition is necessary for the recovery of the information embedded in the affixes of morphologically complex derivative word forms ... both of the channels are 'open' **all** the time ... the phonological process **fades** away simultaneously with the entering of a new input chunk.

*Lehtonen & Sajavaara (1985:91-92)*

This 'dual **code hypothesis**' posits the identification of phonological segment strings as "a possible stage in a fluent perception process, but not obligatory, and not even one which functions under normal circumstances" (see also Foss & Blank 1980).

It is much more **difficult** to access the phenomena that take place in the processes of language production. Since the speaker has to be able to produce, to a degree at least, the same cues that the recipient needs for the processes of interpretation, and if the latter process works the way it is described above, a linear, sequential production of the necessary information is not possible.

The foreign language learner's exposure to his mother tongue has produced a **feature** detection system which makes it possible for him to exploit all parameters embedded in the sound waves such as "allophonic variation, coarticulatory variation, phonetic reduction, compensatory phenomena in phonotactic clusters, timing phenomena, and other types of phonetic variation" (Lehtonen & Sajavaara 1984:94). For the acquisition of a foreign language this detection system has to be reorganized, so that new perceptual **categories** can be adopted that relate to the grammatical system of the new language. Before the system is fully functional, it is quite natural that there occurs various types of interference from the system previously acquired. It is obvious that a learner's phonetic processing is initially dependent on knowledge that has **been** picked up in first language contexts. It is however important not to exaggerate the role of interference on the phoneme **level** at the cost of other possible types of interference. It is **also** important to remember that the whole process of perception is, for the most part, subconscious, and the development of the new cueing mechanism takes place **through** a continuous process of completion and reorganization which gradually **distances** the system from that of the mother tongue. Since there is relatively little optionality in the area of phonological elements, it can be predicted that the degree of interference is the greatest in this **level** of linguistic analysis.

Below, **some** properties of the Finnish and English sound systems will be discussed, and potential sources of **errors** in Finns' pronunciation of English will be described. The main body of the research work on the theoretical basis of contrastive analysis in general, and on contrastive phonology and phonetics in particular, was made at the beginning of the 1970s, primarily within



the Jyväskylä Finnish-English Cross-Language Project (Sajavaara & Lehtonen (eds.) 1977, Lehtonen & Sajavaara (eds.) 1979). This project also produced a textbook of spoken English, aimed at Finnish students (Lehtonen et al. 1977). Not many studies have been reported later. Various aspects of prosody are discussed by Nevalainen 1990. A textbook of segmental phonetics, written for Finnish students of English, has also been published (Morris-Wilson 1992). Questions of the teaching of (English) pronunciation are also discussed in Iivonen & Nevalainen (eds.) 1998 and Nevalainen 1998.

#### IV. CONTRASTING SEGMENTAL PROPERTIES: VOWELS AND CONSONANTS

The English vowel sounds are relatively unproblematic for Finns, as was shown in an early contrastive study by Enkvist (1963) and the first contrastive phonetic study by Wiik (1965). The Finnish sound system includes eight vowels /a o u i e œ y æ/. All of them may be short or long. The quality of the vowels is not affected by the duration of the vowel as much as it is in English. Short vowels, also in unstressed positions, have approximately the same quality as long and stressed ones (Heikkinen 1979). Some difficulties can be expected in learners' perception and production of duration and quality (Marjomaa 1985). This was already shown in Wiik's (1965) pioneering spectrographic study of Finnish and English vowels: his subjects had difficulties in detecting the distinction between the tense and lax vowel qualities in English or in perceiving the reduced vowel quality in /ə/.

The consonantal system of English may cause greater problems for Finns in spoken production (Tommola 1975, Moisio & Valento 1976, Paananen 1998). The learning of the stop system of English involves a number of difficulties. An obvious difference between the two systems is that originally there was no voice distinction between the Finnish stops, and the stops of the Finnish system were the voiceless ones /p t k/ only. The voiced counterparts were introduced through the adoption of loanwords, initially in written language. The alveolar /d/ was established first, from the nineteenth century, and /b/ and /g/ soon followed when the number of loanwords, such as *banaani* 'banana' or *byrokratia* 'bureaucracy', increased. Even today, the voiced stops have not been fully nativized and are heard in very formal speech varieties only. Dialectally, but also in everyday conversation, an unvoiced pronunciation of /b/ or /g/ is common. The situation with /d/ is more complex: in loan words in *behaves* like /b g/, while in standard Finnish it has been introduced word-internally in positions where it does not occur in dialectal or colloquial varieties. Partly because of their social history, the way in which the stop sounds are pronounced is a strong social marker: the voiced pronunciation of /b d g/ is prestiged and some types of the unvoiced pronunciation are rather heavily stigmatized.

It is rather obvious that the English stop system may present difficulties for beginning Finnish learners of English. The precise nature of the difficulties, however, was not properly understood before in a series of studies Suomi (1976, 1979, 1980; see also Hanninen 1979)

examined the voice distinction in Finnish and English stops. **Because** of the rather recent introduction of voiced stops in Finnish, it was often argued that it was precisely these sounds that were difficult in English pronunciation for Finns: Finnish speakers' articulation was expected to **shift** towards the production of /b d g/ as unvoiced. Suomi showed convincingly, however, that the difficulty did not lie in the voicing of /b d g/ alone—as a matter of fact his subjects produced consonants that were 'too voiced'. For the most part, the difficulty seems to be derived from **some** other phonetic aspects of the distinction, such as production of aspiration in /p t k/ sounds, **because** aspiration does not occur in Finnish, and management of the durational differences involved, such as lengthening of vowels before stops that are perceived as voiced, or recognition of other differences arising from the phonetic context. The studies by Suomi illustrated successfully how the actual difficulties in the learning of English by Finns could not be predicted by **reference** to the results of a theoretical contrastive phonological analysis alone. He also made it clear that the complexity of phonetic **features** and contextual factors had to be considered as a whole.

Other types of consonants **have been** studied less systematically. **Some** problems of differentiation, and pronunciation, are to be expected as a result of the fact that there is only one sibilant sound, a voiceless alveolar /s/, in Finnish, in contrast to four sibilants in English. Finnish **also** lacks affricates, and therefore /tʃ/ and /dʒ/ can be expected to be difficult sounds. Similarly, there are no dental fricatives in Finnish, which means that those in English may be **initially** problematic. The other fricatives of English tend to be less difficult, but there may be **some** difficulties to perceive **and** produce the sounds that are equivalents to <v>: there is a fricative in English but a semi-vowel in Finnish. The English nasals and laterals do not present any **major** problems but **some** minor differences in pronunciation may appear, such as production of clear syllable-final /l/ sounds instead of 'dark' ones (Wiik 1966) or of a voiced lateral after a plosive where a voiceless one is required (Monis-Wilson 1992:109). As for the /r/ sounds of the two languages there is a marked difference in the standard pronunciation, even if both languages **have** only one phoneme: the Finnish /r/ is a fairly strong tremulant, while the English one is mostly produced as an approximant or a flap. However, Finnish speakers rarely use their native /r/ pronunciation in English (Monis-Wilson 1992:116).

## V. PROSODY: CONTRASTING SYLLABIC, WORD-LEVEL, AND UTTERANCE-LEVEL FEATURES

Finnish is a quantity language. *Duration* is a distinctive **feature** for both vowels and consonants, resulting in word pairs like *tuli* 'fire' — *tuuli* 'wind' or *tuli* 'fire' — *tulli* 'customs'. In terms of phonology, Finnish is different in this respect from English, where the distinction exists for vowels only. **The** phonological quantity distinction is problematic for many learners of Finnish but it **does** not seem to be a problem for Finns who are learning English. But **some** difficulties

may rise from the fact, pointed out above, that the English distinction between short and long vowels is also a distinction between tense and lax vowel quality or it may be a cue to imply a distinction between subsequent voiceless or voiced stops. For vowel sounds, Finns can be expected to produce a distinction based on duration only and not, or less, on quality. It is also interesting that even if duration plays such an important role in Finnish, Finns learn to observe the lengthening of vowels before 'voiced' stops only **after** the phenomenon is pointed out to them.

In Finnish **word stress** is regular and always located on the initial syllable, while secondary stresses **fall** on **every** second syllable after the initial stress. English word stress, however, has a distinctive function and can thus be placed on any syllable. As a result of this difference, beginning Finnish students of English may tend to move the stress onto the first syllable. Moreover, **some** phonetic differences in the realization of stress can be expected for the reason that stress is manifested by different complexes of phonetic features, such as duration, pitch, or loudness, in different languages. Errors made by Finnish speakers in the production of English stress are studied in Niemi 1979.

The **intonation** of Finnish learners of English has **been** studied by Hirvonen (1967, 1970) and, more recently, by Toivanen (1999). Finnish intonation lacks a systematic grammatical function. Thus the changes in intonation patterns are not used systematically to signal, for example, questions or statements. Hirvonen (1967, 1970) already indicated the obvious **difficulties** of Finnish students in the learning of the utterance-final rising intonation pattern in questions. He suggested that at least partly these problems may be due to difficulties in the 'unlearning' of the highly automatized processes of vocal fold regulation, since there is no **sharply** rising utterance-final intonation pattern in Finnish. Finnish intonation is **also** fairly level, lacking **sharp** rises or falls, and this general patterning, when transferred over to English while not incorrect or ungrammatical as such, may sound pragmatically or sociolinguistically inappropriate, contributing to a 'Finnish accent'. Toivanen (1999), for example, is of the opinion that **it is** important for Finns to learn to use the rising tone more often, partly for **linguistic** but **also** sociolinguistic and pragmatic reasons.

The prosodic phenomena also include a complex of **utterance-level** or even **discourse-level** features, variably referred to as eg. sentence stress, tempo, speech rate, **rhythm** or similar. All contribute to the impression of how the flow of speech is accentuated and how fluent it is (for theoretical considerations see Sajavaara 1987). An example of these phenomena is, for **instance**, the dichotomy in traditional phonetics between stress-timed and syllable-timed languages. English was classified as a stress-timed language, which implies that the duration of syllables is determined by stress: stressed syllables are longer and unstressed ones are shorter. In contrast, Finnish was considered to be a syllable-timed language, in which all syllables, regardless of stress, are of equal length. As has **been** recently **shown** by O'Dell and Nieminen (1998), Finnish **does** not fit this dichotomy but exhibits signs of both stress-timing and syllable-timing.

In the area of *speech rate*, Lehtonen (1979) showed that Finns were considerably slower than native speakers in both reading and (quasi)spontaneous speech tasks (cartoon description tasks) in English when speech rate was measured either in terms of the absolute reading time (sec/passage) or of words/minute in spoken narrative. Lehtonen argued that this was due to the transference of the native speech rhythm and the emphasis given by Finns to words as units of production. Similarly, he showed that Finns had a significantly higher number of pauses than native speakers in descriptions of cartoons. All these phenomena were expected to contribute to the impression of non-fluent speech performance. Finnish speakers' fluency in English has been also studied by Lehtonen and Koponen (1977), Lamminmäki (1979), and Koponen (1992), and speech rate by Marjomaa (1984).

Moreover, there are a number of studies that try to fathom the features of English as spoken by Finns at a more discursive or conversational level. These studies include an exploration of paralinguistic features (Saario 1980) which indicated that Finnish students were more subdued in their use of paralinguistic features than native speakers of English. Conversational patterns of Finns have been discussed, and the myth of the 'silent Finn' deconstructed, in two papers by Kari Sajavaara and Jaakko Lehtonen (Lehtonen & Sajavaara 1985, Sajavaara & Lehtonen 1997). In addition, the norms of English pronunciation teaching (Nevalainen 1998) and the intelligibility of different Englishes for Finnish speakers (Pihko 1997) have also been discussed.

## VI. CONCLUSION

It is to be regretted that there does not seem to be much interest in Finland today to explore the cross-language problems in the areas of study where we are concerned with how speech chains are received and produced. Most of the research that is going on today takes place at universities of technology and is concerned with automatic speech reception and production.

Yet there is a great deal of work to be done before we are able to have a full picture of the phenomena involved, particularly if we are trying to consider the complex of phenomena from the viewpoint of communicative interaction and discourse. In such a context a great deal of the earlier work on contrastive phonetics and phonology may even look rather simplistic and trivial.

The psycholinguistics of speech reception and speech production is still rather undeveloped, which is why it is rather difficult to build up models of speech behaviour across languages. There is plenty of experimental research work to be done in this area.

It is no longer possible to make use of idealized native speakers as models of production, particularly in the teaching of English. We need more information about the ways in which different kinds of non-native and non-standard varieties of English are produced and received in true communicative situations.

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