# 1 *Research of relevance to second language lecture comprehension – an overview*

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## Abstract

*This chapter presents an overview of research to date of relevance to L2 lecture comprehension. After a general introduction to the topic, the first main section of the paper considers the lecture comprehension process. Theoretical conceptions of the process are dealt with under three headings: comprehension in general, distinctive features of listening comprehension, and distinctive features of lecture comprehension. The literature on lecture comprehension micro-skills and note-taking is also considered in this first main section. The second main section of the paper deals with the literature on lecture discourse. This work is divided up into a number of areas: lecturing styles, discourse structure, meta-pragmatic signalling, interpersonal features and lexico-grammatical features. The third and final main section of the paper discusses work on lecture input variables. Under this heading are grouped input studies, speech rate research and work on accent.*

## Introduction

As pointed out in the introduction to this volume, the spread of English as a world language has been accompanied by ever-growing numbers of people studying at university level through the medium of English as a second language, whether in their own country or in English-speaking countries as overseas students. A major part of university study remains the lecture (e.g., Johns 1981; Richards 1983; Benson 1989). Academic listening skills are thus an essential component of communicative competence in a university setting. And yet, although, as Richards (1983) has pointed out, "academic listening" (in contrast to "conversational listening") has its own distinctive features, there has been relatively little research in this specific area.

The purpose of this chapter is to provide an overview of the research which has been done in this area and of related research in other areas which is of relevance to second language lecture comprehension. For reasons of space, a decision has been made not to include the

considerable amount of literature on first language lectures, although this is, of course, relevant to those interested in second language lecture comprehension. However, some of this research is reviewed by some of the other contributors to this book (see chapters by Chaudron, Dunkel and Davis, and King, in particular).

## The lecture comprehension process

Research into the lecture comprehension process is of value in applied linguistics because an understanding of how lectures are comprehended can suggest appropriate ways to encourage second language learners to listen to lectures. It can thus feed into ESL teaching methodology, on the one hand, and learner strategy training, on the other. In addition, information about the lecture comprehension process can guide content lecturers in how to present their lectures to ensure optimal comprehension.

### *Comprehension in general*

Even though listening comprehension has held an important place in language teaching ever since the days of audio-lingualism, most second language research into comprehension has been concerned with reading (Lund 1991). The same emphasis on reading holds true for research into first language comprehension. However, it has generally been assumed that comprehension is a general construct and that the principles of reading comprehension also apply to listening (Anderson 1983, 1985; O'Malley, Chamot, and Kupper 1989; Lund 1991). The following outline of the comprehension process is, therefore, derived mainly from research into reading (although, of course, references to the phonological dimension of comprehension apply solely to listening).

Linguistic theory tells us that there are at least five types of knowledge which will be called upon in the comprehension process as it relates to listening: pragmatic, semantic, syntactic, lexical, and phonological. Psycholinguistic theory (or cognitive science, as this area of enquiry is usually referred to nowadays) posits that these areas of knowledge interact (Anderson 1983, 1985), with the different processes facilitating each other (see Figure 1 in the chapter by Lynch in this volume for a schematic representation of a similar model of the listening process; also Rost, this volume).

To take an example, pragmatic knowledge, in the form of world knowledge and knowledge of the linguistic context up to the point of the utterance being processed, can interact with phonological processing. Thus, at the beginning of a lecture, our knowledge of the schematic structure of this genre allows us to make predictions about what is likely



to be said, as the lecture progresses. We can predict, therefore, that the utterance fragment, "Today, I am going to be . . . ", is quite likely to be followed by the phrase "talking about". However, processing at the phonological level is required to confirm whether the predicted continuation of, "Today, I'm going to be . . . " occurs or not.

There has been a tendency on the part of comprehension theorists to see the different processes involved in comprehension as being in a hierarchical relationship. Thus, for a considerable time, scholars conceived of comprehension as a "bottom-up" process, starting with the "lower level" decoding of the language system, and the representation in working memory of this decoding then being interpreted in relation to "higher level" knowledge of context and the world (e.g., Liberman, Cooper, Shankweiler, and Studdert-Kennedy 1967). Later, scholars working with "top-down" models posited the "higher level" pragmatic, inferential processes as the starting point, with linguistic data at the "lower levels" being processed only if required by comprehenders' expectations and goals (e.g., Sperber and Wilson 1986).

However, metaphors of the comprehension process in terms of "top-down" and "bottom-up" processing are perhaps misleading, as it is far from clear what exactly is meant by "higher" and "lower" levels; in what dimension are they higher or lower? Most scholars now accept the view that comprehension involves a variety of processes, all of which interact, but in what way it is not possible to say (e.g., Clark and Clark 1977; Anderson 1983, 1985). This is the consensus adopted by the leading writers of textbooks on L2 listening comprehension (Ur 1984; Anderson and Lynch 1988; Brown 1990; Rost 1990), (see also Rost; Hansen and Jensen; and Lynch, this volume).

Although the empirical validity of distinguishing between higher and lower level skills must be questioned, one conceptualization along these lines which has been adopted by many second language learning theorists (see Buck 1991, 1992 for references) is worthy of note. This conceptualization sees comprehension as a two-stage process, the first stage consisting of purely linguistic processing and the second of application of the results of this linguistic processing to background knowledge and context. This is an important distinction for those concerned with L2 lecture comprehension because those non-native speakers involved in L2 lecture listening are often considered to have already acquired to a considerable degree the skills involved in the first stage of the process, and any training in lecture comprehension they are offered tends to emphasize the "higher level" skills of the second stage.

Finally, in this brief overview of the comprehension process in general, some reference should be made to schema theory. Schemata are posited as the underlying structures which account for the organization of text in memory and which allow for hypotheses to be generated regarding the

possible interpretation of texts (Anderson 1983, 1985). They are thus a key element in top-down text processing. Although most work on the role of schemata in comprehension has been done in the field of reading (see, e.g., Carrell, Devine, and Eskey 1988), as Buck (1992) points out, there is every reason to suggest that they play just as important a role in listening (see also Long 1989). A number of papers make reference to schema theory in this collection (e.g., Tauroza and Allison; Young; Hansen and Jensen).

## *Distinctive features of listening comprehension*

Although there is an overall high correlation between reading and listening comprehension abilities, the last decade has shown an increasing awareness that listening in a second language involves a set of skills in its own right (Long 1989). The distinctive features of listening comprehension can be grouped under two main headings (see Rost 1990; Lund 1991; Buck 1991, 1992): real-time processing and phonological and lexico-grammatical features.

### Real-time processing

A listening text exists in time rather than space; it is ephemeral and must be perceived as it is uttered. Although there is redundancy in spoken, as there is in written, text (often more, indeed), and listeners' understanding (or lack of understanding) of a segment of text may be revised in the light of new material (Brown and Yule 1983; Buck 1991, 1992), listeners do not have the same degree of control over the text as do readers, who can dwell on parts of the text, skip over other parts, backtrack, etc. (Rost 1990; Buck 1991, 1992).

### Phonological and lexico-grammatical features

Problems are posed by the sound system: cognates in print may differ phonetically in ways which are hard to perceive aurally; the listener must recognize unit boundaries phonologically which would be marked visually in a written text; she or he must also recognize irregular pausing, false starts, hesitations, stress and intonation patterns. As Brown (1990) points out, these features present particular challenges to those non-native speakers who have learned English in an idealized, perhaps written, form and have thus not been exposed to the characteristics of rapid colloquial speech. In addition to these phonological features, spoken text has its own particular lexico-grammatical features which require the application of particular sets of knowledge on the part of listeners (Biber 1988).



## *Distinctive features of lecture comprehension*

Just as listening comprehension has its own distinctive features, with regard to reading, so lecture comprehension has its own distinctive features, with regard to listening in general. Richards (1983) was the first to distinguish between listening skills required for conversation and skills required for academic listening. Some of the differences between conversational listening and academic listening are differences in degree, whilst others are differences in kind.

One difference that is a matter of degree is the type of background knowledge required. In a lecture, listeners are likely to require a knowledge of the specialist subject matter, while in conversation, necessary background knowledge will be more general. Another difference in degree is the ability to distinguish between what is relevant and what is not relevant. While in all comprehension there is a need to be able to understand what is relevant (Grice 1975; Sperber and Wilson 1986), the ability to distinguish between what is relevant to the main purpose and what is less relevant (digressions, asides, jokes, etc.) is paramount in lectures, though perhaps less important in conversation. A third difference of degree between academic and conversational listening is in the application of the turn-taking conventions. In conversation, turn-taking is obviously essential, while in lectures turn-taking conventions will only be required if questions are allowed from the audience or come from the lecturer. A fourth difference of degree between academic and conversational listening is in the amount of implied meaning or indirect speech acts. The emphasis in lectures is generally assumed to be on the information to be conveyed, on propositional meaning, while in conversation interpersonal, or illocutionary meaning is more important (Brown and Yule 1983). (Although see below under the heading "interpersonal meaning" for a different perspective on this question.)

Turning now to differences that are a matter of kind, a number of particular skills are associated with lectures. The first of these is the requirement to be able to concentrate on and understand long stretches of talk without the opportunity of engaging in the facilitating functions of interactive discourse, such as asking for repetition, negotiating meaning, using repair strategies, etc. A second difference of kind is note-taking. James (1977) sees lecture comprehension as a five-stage process which culminates in the note-taking process: decode, comprehend, identify main points, decide when to record these, write quickly and clearly. Chaudron, Hansen, and King (this volume) also emphasize the importance of note-taking in the lecture comprehension process. Another skill related to the lecture comprehension process and not found in conversation is the ability to integrate the incoming message with

information derived from other media. These other media may take the form of handouts given out at the start of the lecture, the textbook which forms the basic reading for the course, or visually displayed materials presented on a blackboard, overhead projector or by some other means.

## *Lecture comprehension micro-skills*

A number of researchers into L2 lecture comprehension have investigated the specific skills, or micro-skills, which are necessary for or facilitate effective comprehension. Although the extent to which micro-skills can be empirically identified and separated is controversial, the micro-skills approach has been influential in the field of second language curriculum development (e.g., Munby 1978; Weir 1990). Micro-skills categories have been derived from three sources: information from comprehension theory, information from lecturers and information from students.

### Information from comprehension theory

Starting from what is known about the listening process, a number of writers on L2 comprehension have extrapolated sets of micro-skills which they assume to be necessary for the comprehension of lectures in a second language. The first such list is incorporated in Munby's well-known micro-skills taxonomy, designed as a tool in overall needs analysis and course design (Munby 1978). Richards (1983) contains the first taxonomy for listening *per se* and also the first for academic listening, as opposed to conversational listening. Richards's list of 18 skills for lecture comprehension includes the following:

- ability to identify purpose and scope of lecture
- ability to identify topic of lecture and follow topic development
- ability to recognize role of discourse markers of signaling structure of lecture
- ability to recognize key lexical items related to subject/topic
- ability to deduce meanings of words from context
- ability to recognize function of intonation to signal information structure (e.g., pitch, volume, pace, key)

Weir (1990) makes use of a similar list of micro-skills to that of Munby and Richards in devising a model for L2 testing

### Information from lecturers

Powers (1986) surveyed 144 faculty members in the United States, to find out their views on the relative importance of 21 lecture-related micro-skills, as they relate to academic performance. Nine skills were



rated as most important:

- identifying major themes or ideas
- identifying relationships among major ideas
- identifying the topic of a lecture
- retaining information through note-taking
- retrieving information from notes
- inferring relationships between information
- comprehending key vocabulary
- following the spoken mode of lectures
- identifying supporting ideas and examples.

Of course, as Powers points out, such a rating has two major inherent limitations: faculty members who are not involved in language instruction may not be competent to analyze listening activities of non-native students, and faculty perceptions are only one of many sources of information (students and ESL instructors being two obvious others) that must be considered in assessing necessary listening skills.

### Information from learners

Another source of information on skills necessary for lecture comprehension is the non-native listeners themselves. Flowerdew and Miller (1992) conducted a study in which they administered questionnaires, supervised diary studies and conducted interviews to find out the problems and strategies of a group of first year Hong Kong Chinese undergraduates attending a lecture course in ESL methods. Problems encountered by the students were speed of delivery, excessive load of new terminology and concepts, and difficulties in concentrating. Strategies used to help comprehension were pre- and post-reading of the set text, peer help, lecturer/tutor help, highlighting relevant sections of the set text during the lecture, note-taking, and efforts to concentrate harder.

Benson (1989) used an ethnographic approach to investigate in depth the listening activities of one overseas student at a university in the United States. He found that his subject, "rather than being preoccupied with the acquisition of new facts, was engaged in a variety of processes relating both to the material and to the teacher" (p. 421) and that "[t]hese processes involved the reduction of incoming linguistic data, the making of new connections within already familiar concepts, and an identification with the teacher's viewpoints." (p. 421)

## *Note-taking*

Note-taking was referred to above as an important micro-skill in the lecture listening comprehension process, although it is worth pointing out

that the extent to which note-taking is employed may depend on the amount of support material available to students in the form of handouts, or students' use of highlighting techniques on their set texts. Flowerdew and Miller (1992), for example, found the students they observed in a series of lectures which used a set text relied heavily on marking the text, rather than taking notes.

Rost (1990) provides a chart of types of notes classified into "topic-relation notes" (e.g., writing down a word or phrase, copying, translating, diagramming), "concept-ordering notes" (e.g., listing topics in order, labelling notes as main points, indenting), "focussing notes" (e.g., highlighting, parenthesizing), and "revising notes" (e.g., inserting, deleting). King (this volume) investigates the relationship between students' notes and the structure of the lectures on which they were based, noting the importance of incorporating visual information from the lecture into the notes.

A number of researchers have studied students' notes as a means of gaining insights into the comprehension process itself (Dunkel 1988; Chaudron, Loschky, and Cook, this volume). As Rost (1990) points out (supported by Chaudron, Loschky, and Cook, this volume), however, there is no direct correlation between quantity or quality of notes and level of understanding. The literature on note-taking is reviewed much more extensively in the chapters in this book by King and by Chaudron, Loschky, and Cook.

## Lecture discourse

If research into the lecture comprehension process can provide information of relevance to the *how* of teaching and learning in relation to lectures and can thus feed into teaching and learning methodology, research into lecture discourse can provide information of relevance to the *what* of teaching and learning, i.e., it can indicate to teachers and course designers what linguistic and discoursal features learners need to be familiar with in order to understand a lecture and what, therefore, should be incorporated into ESL courses. In addition, a knowledge of the linguistic/discoursal structure of lectures will be of value to content lecturers in potentially enabling them to structure their own lectures in an optimally effective way.

### *Lecturing styles*

A number of different styles have been identified for delivering lectures. Morrison (1974, reported in Jordan 1989: 153) divided science lectures into two kinds: formal ("close to spoken prose") and informal ("high informational content, but not necessarily in highly formal register").



Dudley-Evans and Johns (1981) (also Dudley-Evans, this volume) distinguish three styles of lecturing: "reading style", where the speaker reads or speaks as if reading from notes; "conversational style", where the speaker speaks informally, with or without notes; and "rhetorical style", where the speaker presents herself or himself as a "performer", using a wide intonational range and making frequent digressions, marked by shifts of key and tempo. Goffman (1981) recognizes three modes of lecture: "memorization", "aloud reading" and "fresh talk". In keeping with modern trends in teaching and a greater encouragement of student participation, Frederick (1986, cited in Benson 1989) refers also to the "participatory lecture", which is closer to discussion. In their contributions to this volume, both Benson and Mason detect a move towards the more interactive style of lecturing.

Extrapolating from these various approaches, the key parameters in characterizing lecture styles would seem to be whether the lecture is processed by the speaker in real time or is read and whether it allows for any spoken interaction with the audience or is pure monologue. Although there is no published survey of the relative frequency of types of lecture style, the general consensus is that the informal, conversational style, based on notes or handouts, is probably the predominant mode of lecture presentation, to both native and non-native-speaker audiences (McDonough 1978; DeCarrico and Nattinger 1988; Dudley-Evans, personal communication; a number of contributors to this volume). Concerning levels of interactivity in lectures, Hansen and Jensen (this volume), based on a survey of introductory lecture classes in their university in the United States, found the level of interactivity to vary according to class size: the larger the groups, the less the interaction.

The move towards greater informality in lectures, at least in the United States, it is worth pointing out, could cause problems for non-native speakers from backgrounds where lecturing is carried out on more traditional lines. These problems might be of a cultural nature, relating to the role and status of university lecturers and the degree of deference accorded to them; or they might be related to content, interactive lecturers blurring the more clear-cut structure of the traditional lecture monologue.

### *Discourse structure*

Surprisingly little work has been done on analyzing the discourse structure of academic lectures, when compared with other academic genres such as the research article (Swales 1990). Much of the research that has been done was carried out in the 1970s (e.g., Cook 1975; Montgomery 1977; Murphy and Candlin 1979; Coulthard and

Montgomery 1981) and is developed out of the Sinclair and Coulthard (1975) model of primary school classroom discourse.

Murphy and Candlin note the similarity between lectures and the sort of settings Sinclair and Coulthard had in mind for their analysis of classroom discourse:

> . . . fairly formal situations [where] one participant has the floor whenever he wants it (Coulthard 1975, cited in Murphy and Candlin 1979: 13).

Although lectures are basically monologue, unlike school lessons, which are dialogue, Murphy and Candlin (1979) are able to provide a range of examples to show how a number of the interactive acts from the Sinclair and Coulthard model occur also in lectures:

| | |
|---|---|
| marker: | *Well.* Obviously . . . |
| | *Right.* Everybody . . . |
| | *Now.* Let me . . . |
| starter: | Well now. *Let's get on with the engineering.* |
| informative: | for the three forces to be in equilibrium their vectors must form a closed triangle |
| aside: | running out of blackboard here |
| metastatement: | let me sound reveille, *I want to mention two types of generator.* |
| conclusion: | So there you've got three forces which are in equilibrium. |

Another feature in common with classroom discourse is the rank scale of discourse units. Cook (1975), for example, adapted Sinclair and Coulthard's rank scale for primary classroom discourse of Lesson, Transaction, Exchange, Move, and Act to propose for lectures the following ranks: Lecture, Exposition, Episode, Move and Act. Starting at the top of the hierarchy, each level is made up of elements at the rank below. Thus a "lecture" is made up of various classes of "exposition", an "exposition" is made up of different classes of "episode", etc. However, Cook is only able to describe the boundaries of these units and is unable to say much about their internal structure (there is the same problem in Sinclair and Coulthard 1975).

Coulthard and Montgomery (1981), in their application of the Sinclair and Coulthard model to lectures, offer a framework consisting of just four ranks – Lecture, Transaction, Sequence, Member – where Transaction is characterized by its focussing boundaries, Sequence by phonological means (the use of high pitch), and Member syntactically (it consists of a free clause). Coulthard and Montgomery distinguish two types of Member: those Members whose activity functions on a "main discourse" (informative) level and those which function on a "subsidiary discourse" (metapragmatic) level.

An inability to recognize macro-structure is seen by a number of



applied linguists as an important problem of non-native speakers in understanding lectures (Wijasuriya 1971; Lebauer 1984; Chaudron and Richards 1986, Tauroza and Allison, this volume; Young, this volume). In a study of comprehension of engineering lectures by non-native speakers, Olsen and Huckin (1990) claim that although students may understand all the words of a lecture, they may still fail to understand the main points and logical argument. This lack of understanding Olsen and Huckin attribute to a failure to employ knowledge of the overall discourse structure (as well as background knowledge). Similar conclusions are drawn from a follow-up study, reported in this volume by Tauroza and Allison.

Dudley-Evans (this volume) is in broad agreement that a knowledge of macro-structure is likely to aid comprehension. However, he notes that, based on contrasts between Olsen and Huckin's findings for engineering lectures and his own for plant biology and highway engineering, frameworks will vary according to discipline. This variation across disciplines is also pointed to by Strodt-Lopez (1991), who found that her corpus of humanities and social science lectures did not exhibit the hierarchical structuring identified by Olsen and Huckin for engineering:

> The work on discourse structures and interpretive frames suggests that a professor should adhere to a conventional lecture structure, thereby maintaining topicality and evoking in students at least a partially pre-existing frame to reinforce the intended interpretation. This is not, however, what professors do. Rather, they develop topics from many angles and evoke numerous interpretive frames. (Strodt-Lopez 1991: 118)

This view of macro-structure outlined by Strodt-Lopez accords with the rather different approach to lecture discourse of Young (this volume), based on the analytical unit of the strand, or "phase". Young identifies six phases, which reoccur in a discontinuous manner, interspersed with each other in any lecture. What is interesting about this approach is that it allows different types of lecture to be analyzed using the same system of analysis. Thus certain phases might be more prominent in engineering lectures, say, while other phases would be more prominent in, say, humanities lectures.

## *Metapragmatic signalling*

Reference was made in the previous section to Coulthard and Montgomery's distinction between the "main discourse", or informative level, and the "subsidiary discourse", or metapragmatic level in lectures. The importance of metapragmatic signalling devices in facilitating comprehension has been recognized by a number of researchers (Chaudron and Richards 1986; DeCarrico and Nattinger 1988; Rounds

1987; Tyler, Jefferies, and Davies 1988) and writers of ESL texts (Dunkel and Pialorsi 1982; Mason 1983; Ruetten 1986). Coulthard and Montgomery (1981) make the interesting speculation that what makes "reading style" lectures difficult to follow is the very lack of such devices.

DeCarrico and Nattinger (1988) analyzed "macro-organizers" occurring in lectures from a variety of disciplines. They set up eight main categories of "lexical phrase", as they refer to these devices, according to their various functions (e.g., "lemme start with . . . " (topic marker), "so let's turn to . . . " (topic shifter), "to tie this up . . . " (summarizer). The assumption is that these markers will aid comprehension. Empirical testing of the hypothesis that metapragmatic signals aid comprehension is reviewed later in this chapter in the section on lecture input variables.

## *Interpersonal features*

Increasingly, researchers are becoming aware that a lecture is not merely a medium for conveying information, but also for relating to the audience and conveying attitudes and opinions. A number of studies have alerted applied linguists to this dimension of lectures. In a series of papers analyzing definitions in science lectures, Flowerdew (1991, 1992a, 1992b) showed how definitions, which might be thought of as an informative speech act *par excellence*, are hedged with all sorts of pragmatic features to do with how the speaker relates to the audience, how the definitions fit into the overall discourse, the attitude of the speaker to the definition, the amount of emphasis to be put on the definition, and so on. Strodt-Lopez (1987, 1991) analyzed two interpersonal features of lectures – anecdotes and asides – showing how both contribute to the global coherence of lectures in conveying speakers' attitudes and opinions.

Working within a broader framework – that of providing non-native-speaker teaching assistants with a characterization of what constitutes communicatively competent teaching discourse – Rounds (1987) has provided a description of a number of interpersonal features of mathematics lectures. Of particular interest in Rounds's analysis is the emphasis put on the ability of competent lecturers to develop "an atmosphere of cooperative interaction and consensus – a sense of working together to achieve a common goal" (p. 666). Rounds calls this "elaboration", as opposed to the mere transmission of information. "Elaborative" features of discourse identified by Rounds include the following:

1 naming processes
2 overtly marking major points, both to evaluate and reinforce student achievement



3 developing cohesion and continuity within and between lectures by repetition and "linking talk"
4 explicitly organizing topics and marking topic change
5 stating the scope of the students' responsibility
6 using questions in a timely fashion
7 using persuasive techniques.

To date, unfortunately, little attention has been paid to interpersonal features such as these, in L2 academic listening texts.

## *Lexico-grammatical features*

Reference was made earlier in this chapter to the distinction between two phases in listening comprehension – a linguistic decoding phase and an application of the results of this decoding to background knowledge and context phase – and the emphasis on the part of some of those concerned with academic listening on the second of these two phases. However, as a number of writers who emphasize the importance of the role of lexis and syntax in listening comprehension suggest, this emphasis on the second of the two stages needs to be treated with caution. Not only may linguistic decoding be a problem in itself, especially with more limited proficiency listeners, but, as McLaughlin (1987, cited in Rost, this volume) has pointed out, problems in linguistic decoding on the part of L2 listeners can distract cognitive resources away from the second-stage processes which native listeners are able to focus on more fully.

Kelly (1991), based on an empirical study of learners' lexical errors, or "misperceptions", has argued that lexical ignorance is the main obstacle to listening comprehension with advanced learners. Rost (this volume) also singles out lexis as a key problem shared by the subjects involved in the lecture comprehension experiment he reports. The students in Flowerdew and Miller's (1992) study, as mentioned earlier, also reported lexis to be one of their main problems in lecture comprehension.

Only a few studies have been published on the lexis of academic lectures. Johns and Dudley-Evans (1980) analyzed the lexis of lectures in the two very different areas of transportation and plant biology into three categories: technical, semi-technical and colloquial, identifying the particular problems encountered by students with each type. In a computerized analysis of a corpus of biology lectures given to non-native speakers, Flowerdew (1993) noted the very restricted lexical range of these lectures, arguing that teaching materials derived from such a corpus would have a very manageable set of lexis.

Turning now to syntax, lectures, as a type of spoken text, might be thought to be characterized by those syntactic features which are typical

of spoken, as opposed to written, language (Tannen 1982; Halliday 1985/89; Horowitz and Samuels 1987). However, as Biber (1988) points out, there is no single parameter of linguistic variation that distinguishes spoken and written texts. Instead, there are what he refers to as dimensions, i.e., clusterings of features which work together to fulfil some underlying function within the various spoken and written genres, e.g., formal/informal, restricted/elaborated, contextualized/decontextualized, involved/detached. On these parameters spoken text will, in general, tend to be informal, restricted, contextualized and involved. However, different types of spoken texts may vary in their characteristics. Thus, lectures, as relatively literate, planned artefacts, are likely to share many of the features of written texts, although the extent to which they manifest this trait will again be subject to variation. A read lecture, for example, is likely to be more formal, elaborated, decontextualized and detached than a more spontaneously produced one.

In general, spoken text is characterized by a high incidence of the following linguistic features:

"that" clauses, subordinate cause clauses, subordinate conditional clauses, first person pronouns, second person pronouns, contractions, pronoun "it".

Written text, on the other hand, exhibits a high frequency of the following items:

nominalizations, prepositions, specific conjuncts, agentless passives, low type/token ratio. (Biber 1988)

Flowerdew (1992c), in a comparison of two corpora, one made up of a biology lecture course to non-native speakers and the other consisting of the chapters from the textbook upon which the lecture course was based, broadly corroborated these distinctions as they relate specifically to academic lectures and textbooks.

It is clear from the above discussion of lexico-grammatical features of lectures that there is a need for the use of authentic lectures in academic listening teaching materials; scripted texts are obviously likely to present to learners a type of language that is not authentic.

## Lecture input variables

There are two possible ways to help non-native speakers understand lectures in a second language. One is to improve their knowledge and skills in the target language until the comprehension process is no longer a problem. The other is somehow to modify the form of the lectures, to vary the input, so as to make them easier to comprehend. Research into the effect of input variables, as well as being of interest to teachers and course designers, who can make use of such modified input in developing teaching materials, can also be of value to content lecturers, who can incorporate these modifications into their own lectures to second language students, with a view to making them more comprehensible (see Lynch [this volume] for a discussion of these issues).



### *Input studies*

Most of the early "input" studies were limited to creating taxonomies and quantifying modifications made by speakers to non-natives (see Chaudron 1988 for review). They did not attempt to measure any effects these modifications might have on comprehension. In addition, most of the input studies were based on informal interaction, not lectures. One tendency noted within this research, however, is that interactive aspects of modification (repair, negotiation of meaning, confirmation checks, back-channel cues, etc.) tend to be effective in increasing communication. It is thus possible that lectures of a more interactive nature, encouraging more audience participation, will be more easily comprehended by non-native speakers (although see Lynch [this volume] and earlier comments in this chapter, regarding potential drawbacks of interactive lecturing). In an unpublished study, Griffiths (personal communication) lent support to the hypothesis that more interactive lecturing might be beneficial. Using groups of Omani students as subjects, Griffiths presented a lecture in an interactive conversational style and in a non-interactive reading style. Subjects scored higher on both objective comprehension tests and a subjective self-rating instrument for the interactive style.

Another lecture-oriented input study, and one often quoted, investigated the effect on comprehension of pragmatic signalling devices, or discourse markers (Chaudron and Richards 1986). Chaudron and Richards (1986) presented subjects with the same lecture with and without discourse markers. On testing subjects after listening, they found that "macro-markers" (higher-order markers marking major transitions) had a greater effect on recall than did "micro-markers" (lower-order markers linking clauses and sentences). See also Dunkel and Davis (this volume), for contrasting findings on a similar experiment.

There are very few experimental studies such as those of Griffiths (personal communication) or Chaudron and Richards (1986), however. Much more empirical work of this type is needed on the effect of modifications to lecture input before meaningful recommendations can be made to ESL course designers and content lecturers.

### Speech rate

One exception to the above statement concerning the paucity of experimental studies in lecture comprehension research is in the area of speech rate. Speech rate is an important area for lecture comprehension research. In the research already referred to into the lecture comprehension problems and strategies of mother-tongue Cantonese speakers listening to lectures in English by Flowerdew and Miller (1992), subjects were unanimous in rating speed of delivery as the greatest obstacle to understanding. When questioned why this should be so, subjects referred to the great amount of processing required of the incoming data in a very short space of time. Such evaluations are consistent with Griffiths's (1990: 56) comment that "[a] normal speed of delivery requires a great deal of work in a very restricted time".[1]

Important questions for speech rate studies are as follows:

1. What are the reasons for non-native speakers' difficulty with speed of delivery?
2. Can comprehension be improved by controlling speed of delivery?
3. If so, what are the optimum rates for different levels of learners?
4. Is it possible for lecturers consciously to control their rate of delivery?

### 1. What are the reasons for non-native speakers' difficulty with speed of delivery?

Based on experiments with time-compressed speech, Conrad (1989) found that native speakers, unable to comprehend fully a set of accelerated sentences, are more able than non-native speakers to get a maximum amount of information from the message by using their knowledge of the language to assign syntax and to predict which words would be content words. Non-native speaker comprehension is more hindered, therefore, than that of natives by a faster speech signal. In an earlier study, Henrichson (1984) showed that contraction and reduction had a much greater effect on the comprehension of non-native speakers, even at advanced levels, than it did on the comprehension of native speakers. This result was attributed to the much greater dependency of non-native speakers on a strategy in which they attempted perfect decoding. The studies by Conrad and Henrichson both show, therefore, that the reliance on decoding is a hindrance to non-native speakers' ability to cope with the incoming speech message, in contrast to the native speakers, who are able to apply inferential processing to make up for gaps in decoding. This is a reason also cited more anecdotally by Heaton (1977) and Jordan (1977).

[1] As two anonymous reviewers of this book pointed out, it is possible that speed of delivery is an *effect* of difficulty in comprehension, not a cause, i.e., non-native speakers have problems understanding and, therefore, perceive speech as fast, even though objectively it is not.



### 2. Can comprehension be improved by controlling speed of delivery?

Grosjean (1972, reported in Griffiths 1990) found that non-native listeners scored markedly higher on comprehension tests based on texts modified in terms of articulation rate and pause frequency and duration. Likewise Conrad (1989), in her compressed speech experiments, found that non-native speakers scored better on comprehension tests as rates were decreased. Anderson-Hsieh and Koehler (1988) discovered that on passages read by both natives and non-natives, comprehension scores were significantly higher when the passages were read at slower rates. Overall, based on these findings, it would appear that slower rates enhance comprehension.

Griffiths (1990) showed that for lower intermediate listeners, although moderately fast speech rates (220 wpm) resulted in a significant reduction in comprehension, comprehension of slow rates (100 wpm) was not significantly greater than that of average rates (150 wpm). Similar lower comprehension levels for artificially slowed speech were found by Derwing (1990, reported in Brumfit and Mitchell 1991). Thus while comprehension can be enhanced by avoiding faster speech rates, it appears from these findings that there is no benefit to be derived from exaggeratedly slow delivery.

### 3. What are the optimum rates for different levels of learners?

The Griffiths (1990) study, cited above, suggested an optimum rate of delivery for his lower intermediate learners. As he pointed out, however, more studies are needed to establish optimum rates for different proficiency levels. Upper intermediate or advanced listeners presumably might have coped better with the faster rates in Griffiths's study. On the other hand, given the finding that artificially slow rates are a hindrance rather than a help (Griffiths 1990; Derwing 1990, reported in Brumfit and Mitchell 1991), beginners would have been unlikely to benefit from slower rates. In addition, the effect of text difficulty as a variable on comprehension at various speech rates needs to be investigated (Griffiths's research, for example, was based on simplified texts), as does the effect of different ways of slowing: by means of a machine, by slower articulation on the part of the speaker, by lengthening of pauses, or by insertion of extra pauses. Another factor that needs to be borne in mind in evaluating the research on speech rate is that much of this research is

based on read text. For speech rate data to be of real value for research into academic listening, it would obviously be preferable to have data on conversational style lecturing. More research is needed in this area of speech rate studies before recommendations can be made to lecturers or materials developers regarding optimum rates of delivery.

## 4. Is it possible for lecturers consciously to control their rate of delivery?

Based on a sample of 22 lecturers using a conversational style of lecturing to non-native speakers, Tauroza and Allison (1990) showed a wide range of rates of delivery. In a controlled experiment, Griffiths and Beretta (1991) had six university lecturers give the same lecture to groups of native speakers, low-proficiency non-native speakers and high-proficiency non-native speakers. They found that lecturers made no significant adjustment to their speech rate when lecturing to the different groups. This finding, based, admittedly, on a small number of subjects, suggests that lecturers cannot necessarily be expected to modify their speech rate when lecturing to non-native speakers.[2] The question remains as to whether lecturers *are able to* moderate their speech rate, given training.

### *Accent*

Accent is often singled out as a factor contributing to difficulties for non-native lecture comprehension (Kennedy 1978; Richards 1983; Bilbow 1989). It is true that non-native speakers studying through the medium of English are likely to encounter a range of accents, both native and non-native.

The research into the effect of accent on comprehension is quite clear-cut in supporting the commonsense view that unfamiliar accents cause difficulty in comprehension (Eisenstein and Berkowitz 1981; Smith and Bisazza 1982; Anderson-Hsieh and Koehler 1988). The concept of familiarity extends to the question of the comprehensibility of local vs. standard accents of English, local accents proving to be more comprehensible (Brown 1968; Ekong 1982; Smith and Bisazza 1982).

These findings on accent have clear implications for pedagogy. If non-native speakers have least difficulty with familiar accents, then, other things being equal, those lecturers who are likely to be most easily comprehended will be from the students' own language background. Next most comprehensible are likely to be those lecturers with the accent

[2] See Lynch (this volume) for further discussion of the study by Griffiths and Beretta and on the issue of lecturer training.



closest to the model learners have been exposed to in their studies and in society at large (e.g., American English in the United States, Taiwan, the Philippines; British English in the U.K., Hong Kong, Singapore). Where it is not possible to control the background of lecturers lecturing in English, then, where possible, students should be exposed to few lecturers over a longer period rather than many lecturers over a shorter period, so as to allow students to develop familiarity with their accents.

## Conclusion

This paper has reviewed a large body of research of relevance to second language lecture studies. Some of the findings of this research are clear-cut, e.g., the research on accent. However, the majority of the work raises more questions than it answers. One thing that is clear from this review is that a lot more research is needed before we have a clear idea of what constitutes a successful second language lecture. A lot more information is needed – in terms of how a lecture is comprehended, in terms of what a lecture is made up of, and in terms of how the variable features of a lecture may be manipulated to ensure optimum comprehension – before meaningful statements can be made about many aspects of lectures which will have concrete effects on pedagogy.

One of the problems with the research base in second language lectures is that many of the studies which have been cited here as forming part of this base are not focussed on lectures *per se* (e.g., they have looked at comprehension in general or spoken discourse in general). Faster progress will, perhaps, be made if a research agenda is created which is specifically targeted at second language lectures. Such is the aim of the present collection, and it is hoped that the rest of the chapters in this book will be found to make at least a start in developing this agenda.

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