Towards a Model of Turn-taking in Conversation

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Acknowledgements

Summary

A central feature of conversation is that people take it in turns to speak. Typically speaker-listener roles are exchanged in a smooth and orderly fashion, with little or no gap or overlap.

To date, within psychology only one comprehensive model of turn-taking has been proposed (Duncan, 1972). This model is cue based and suggests that discrete cues are responsible for the smooth management of conversation. There are, however, a number of fundamental shortcomings in the methodological and conceptual analysis that underpins this model. The aim of this thesis was to address these shortcomings for they have broader implications for our understanding of the turn exchange process. The methodology employed involved both the qualitative and quantitative micro-analysis of conversational data. To test the general significance of this analysis a more experimental approach, involving subjects judgements about particular sections of conversation, was employed. In order to put the generality question to the test, the investigations were based on different types of conversations - face-to-face conversations involving agreement and disagreement and telephone conversations involving travel enquiries and directory enquiries.

The research carried out in this thesis has demonstrated that a wider range of information is exploited for turn-taking purposes than previously thought. The turn-taking cues Duncan identified could not provide an adequate explanation of how a smooth exchange of turns was actualised at a particular location. Two judgement studies demonstrated that whilst some conversations were managed by discrete cues as Duncan had suggested, others were not. Further investigations provided evidence that certain aspects of verbal content provide higher order and local information that is important for turn-taking. These investigations thus demonstrated that a cue based model of turn-taking is inadequate and emphasize the need for future work to provide precise explanations about how contextual factors are exploited in this process.

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Chapter 1

Prolegomenon to the Study of Turn-taking in Conversation

Social interaction plays a fundamental role in daily life. Typically these interactions are based around talk, which is undoubtedly the most important form of human communication. Language is an essential part of the evolutionary history of homo sapiens and it is argued that it is the single most important feature that distinguishes us from all other animals (Chomsky, 1976). It enabled primitive human beings to hunt more effectively (Hewes, 1973) and it undoubtedly contributed to the development and transmission of our cultural heritage. It's importance has not been diminished in the modern age. In fact it could be ventured that new technology has actually made talk more important for now, via telecommunication systems, the spoken word can transcend vast distances and it is partly for this reason that we all now inhabit Marshall McLuhan's global village. New research is underway to further the usefulness of conversation by developing software which will enable humans to communicate with computers via speech, without the need for a clumsy keyboard. The success of this endeavour would clearly aid the efficient and accurate dispersal of information as the computer could then be used for the access of a remote data base, which may contain important information about even everyday matters like, for example, travel information. The extraordinary success of the telephone indicates that successful communication can still occur in the absence of visual information despite the fact that humans have spent thousands of years communicating in close proximity (see Hall, 1959) with visual contact.

One feature of all conversation is that they appear to be characterized by an implicit order, normally there is quite a precise co-ordination of expectancies and actions as we, for example, exchange greetings and farewells. But how are our actions in social interaction structured and organised and what are the functions of the different actions that occur? It has been argued that the answers to these questions will provide a key for understanding human behaviour (see, for example, Goffman, 1955). However, we shall see that although there have been a few isolated attempts to get to grips with these questions, it is significant that in the past the study of actual interaction and, more specifically, conversation, has been neglected by psychology, linguistics and sociology. Below follows a brief sketch of why this has been the case.

Within psychology studies of interaction have tended to be based on the assumption that the entire constellation of action in an interaction does not affect the meaning or

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role of the various individual 'actions'. In other words, contextual factors have not been treated as a significant variable. Rather the approach has involved attempting to tackle experimentally, in a decontextualised manner, broad questions about how different elements in interaction function (for example, Mehrabian and Wiener, 1967; Mehrabian and Ferris, 1967, Argyle, Alkema and Gilmour, 1971; Argyle, Salter, Nicholson, Williams and Burgess, 1970).   All these investigations listed above employed a similar methodology. That is, they got subjects to rate on a scale the attitude of a speaker whose message contained conflicting verbal (that is speech) and nonverbal information, which may included kinesic (e.g. posture and gesture), prosodic (i.e. intonation, rhythm and pausing) and paralinguistic (e.g. 'umm' and 'ah', laughter, crying) aspects.   For instance, Mehrabian and Wiener (1967) attempted to assess the relative importance of tone (that is pitch and stress) and content (that is the meaning of the words) in decoding positive, neutral and negative attitudes. The subjects were presented with tape-recordings of single words that were read in affective tones that represented each of these attitudes. (Both verbal and nonverbal components had been pre-tested to check that they had comparable effects on listeners' evaluation of these attitudes.)   In the two later experiments, which investigated the communication of hostile/friendly attitudes (Argyle et al., 1971) and superior/inferior attitudes (Argyle et al., 1970), the nonverbal message involved a combination of a number different elements - head position, facial expression, posture and tone of voice. Thus, for example, the hostile nonverbal style involved a harsh voice, frown with teeth showing and tense posture (Argyle et al., 1971). The results of all these experiments seemed to show conclusively that nonverbal style had the greatest influence on subjects ratings of attitudes. On this basis it was proposed that   the communicational functions of the verbal and nonverbal channels are quite separate. Specifically, it was claimed that whilst the nonverbal channel is primarily used to negotiate interpersonal attitudes, the verbal channel is used to convey information (see also Argyle, 1974; Trower, Bryant and Argyle, 1978).

However, it has been argued that the interpretation given to these results did not give due consideration to the limitations imposed by the design of the experiments. For instance, the results of these experiments show that the nonverbal channel will dominate when the information 'leaking' (Ekman and Friesen, 1969) from it is in conflict with the verbal (Brown, 1986) and when exaggerated styles of communication are employed (Beattie, 1983). In particular, these experiments did not tap the fact that language can be used to express any thought or feeling (Brown, 1986) and, in addition, that it can do this subtly by, for example, the speakers choice of word and syntax (Beattie, 1983; Brown, 1986). However, nonverbal channels are restricted to the communication of a particular narrow class of meanings and can not be used to relate complex information (Brown, 1986). In short, the laboratory set-up of

these experiments did not capture the complexities of social interaction and undermined the subtleties of verbal communication. (For further discussion of these and other limitations, see Beattie, 1983, p7-15 and Brown, 1986, p496-500.)

In linguistics, at least during the Chomskian era, the study of language focussed on examining native-speakers intuitions or judgements about hypothetical, idealised sentences of their language (that is, sentences which were free from the errors and mistakes that normally occur in spontaneous speech); for instance, speakers (typically the linguists themselves) were asked to judge whether certain sentences were grammatically correct or incorrect (Chomsky, 1965). The principle aim was to try and discover the rules that underpin a native speakers linguistic knowledge. In other words, they sought to describe:

> 'the system of rules and principles that we assume have, in some manner, been internally represented by the person who knows a language and that enable the speaker, in principle, to understand an arbitary sentence and to produce a sentence...'
> (Chomsky, 1980, p201)

Discovery of these rules or linguistic *competence* would enable theorists to propose a grammar of language, which would give an exhaustive description of grammatical sentences that occur within a certain language. The use of idealised and abstract data in pursuit of this goal was justified because the linguists at this time were not concerned with how language was actually used, they were not interested in the errors of *performance* that occurred whilst a speaker applied their linguistic competence. However, some psychologists and even some linguistics have argued that it is precisely these factors that yield an insight into the structure and operation of the 'machinery' which underlies language use.

During the nineteen fifties mainstream sociological theory of action (cf. Parsons) attempted to explain persistent institutionalized patterns of social action by proposing that this order was determined by the internalisation (via a series of rewards and punishments) of *institutionalized* social norms within an individual. These were believed to create enduring dispositions to act according to a particular normative framework. In other words, individuals were regarded as internally motivated to maintain institutionalized patterns of action. Thus Parsons argued that the task of theory was to ascertain the constitution of social events and then evaluate and explain an actors actions in terms of their normative or rational characteristics. It followed from this approach that there was no necessity to study how social interaction was organised. However, one sociologist, Garfinkel, rejected this approach. Drawing from the writings of the phenomenologist Schutz, he argued that humans are not 'judgemental dopes' directed by social norms. He placed renewed emphasis on the

role of human agency in social action, arguing that social norms only serve to constrain action. Garfinkel thus argued that the key to understanding social action is to study the commonsense knowledge, which ordinary members of a culture employ to produce and recognize intelligible courses of action in an interaction. He called this course of study ethnomethodology.

An ethnomethodological analysis of a commonplace encounter assumes that the implict order that emerges in unfolding structure of an interaction makes actions understandable or 'accountable'. Another assumption is that the interaction is contextually oriented. For it is claimed that an action can only be understood by reference to the immediate context of the interaction and, in addition, that each individual action provides (or renews) the immediate context for the next action. Ethnomethodologists assume all actions in an interaction are produced for the co-participants and hence are meaningful to them. These assumptions have necessarily affected the way ethnomethodological analysis is carried out. Basically, it involves identifying regularities in the participants conduct and, in addition, supplying qualitative evidence or a 'warrant' that the observed pattern is actually responded or 'oriented' to by the participants. This evidence is regarded as establishing the validity of the interpretation. In Garfinkel's early research the 'warrant' often took the form of the confusion and anger bought about by a confederate breaching a basic assumption which is normally taken-for-granted in interaction. In one experiment confederates were asked to engage in conversation and then ask their interlocutor to clarify what they meant by a commonplace remark. For example:

S: How are you?
E: How am I in regard to what? My health, my finance, my school
      work, my peace of mind, my...
S: (Red in the face and suddenly out of control.) Look I was just
      trying to be polite. Frankly, I don't give a damn how you are.
(taken from Garfinkel, 1967, p40)

The remarks of the confederate were regarded as violating the assumption that an individual will make every effort to make sense of what is said. More recently (in the last 12 years) an important, and perhaps more well-known, branch of ethnomethodology has developed - conversational analysis. This has focussed specifically on trying to unravel the principles of social organisation of conversational interaction. However, there is one major problem with the ethnomethodological approach. This stems from the fact that it assumes that the analyst can determine which actions and why these actions are salient to the participants. Yet, for example, in the case of conversational analysis some actions, such as a very subtle and slight change of intonation, may be embedded in a stream of other more obvious actions, such as a change in line of gaze and the cessation of gesticulation. In these cases the

significance of the intonation variation may not be detected. In other words, this method relies heavily on the skill and sensitivity of the analyst. It could be argued that such confounds can only be unravelled by using a more direct experimental method. A further limitation of conversational analysis, at least from a traditional positivist perspective, is that the ethnomethodologist rarely presents information about the frequency with which they observed a particular phenomena. It is thus difficult to assess its relative importance in structuring an encounter; for example, the phenomenon observed could be just an isolated incident or it could form a crucial part of a conversation .

A different attempt to examine the structure of interaction was initiated in 1956. This was in fact the first systemmatic multi-disciplinary investigation of its kind. It was an endeavour, involving psychiatrists (Brosin and Fromm-Riechman), linguistic anthropologists (McQuowan and Hockett) and anthropologists (Bateson and Birdwhistell). It represented the synthesis of a number of converging influences from areas including social philosophy, interpersonal psychiatry, structural linguistics, information theory and ethology. The importance of studying the interactional process was stressed by social philosophers such as Mead; for they argued that the meaning of a social act is determined by anothers response to it and hence the meaning and nature of relationships are emergent products of the process of social interaction. Some psychiatrists (for example, Sullivan) influenced by this line of thinking, postulated that the kinds of interactions people had may play a significant role in the genesis of psychiatric problems. This theory served to emphasize further the importance of understanding the processes involved in social interaction. The methodology employed in the 1956 investigation was influenced by work of anthropologists, like Boas and Sapir, who aimed to describe American Indian languages that were often unknown to them. They developed a method for establishing the significant elements of an unknown language. Essentially this involved making detailed transcripts, and using this to try and group various sounds, checking to see if these were salient to a speaker of that particular language. The success of this method hinged on ensuring that the transcripts were comprehensive since any behaviour that was excluded may in fact be of crucial importance. From this anthropological work came an appreciation of the importance of looking at actions in the context in which they occur and, in addition, full recognition of the fact that speech is embedded in a stream of other communicative behaviours (this conception of all behaviours in terms of communication, that is as a potential 'signal', also emerged from information theory). There also came the attendant suggestion that perhaps this linguistic method of analysis could be applied to try and ascertain the significance of other communicative behaviours in conversation. Interestingly, this linguistic method has parallels with the ethological method of studying behaviour, which is

based on the assumption that the importance of patterns of behaviour can only be established by observation of an animal in a natural setting. The influences outlined above can be seen clearly in the method that was developed during the collaboration in 1956, and which was later termed 'context analysis'.

The method of context analysis was based on the assumption that the function of a particular behaviour can not be determined by the qualities of the behaviour itself. Rather that it is necessary to examine what happens to the entire system of behaviour and the relationship of the participants when it does and does not occur. In other words, it was argued that a behaviours function is understood by its relationship to the larger system of communication, which as a whole comprises of an integrated arrangement of, for example, lexical, kinesic and tactile structural units. These researchers thus sought to discover naturally occurring units of behaviour and examine how these units of behaviour related to a hierarchy of more inclusive structural units. This involved making a very detailed transcription of the interaction and from this attempting to see how various actions grouped together. Formulations about these potential relationships were then tested and refined on the basis of examination of other data (see McQuowan, 1959 and Scheflen, 1963).

Context analysis has been employed to further understanding of communicational processes within psychotherapy, specifically the link between language and certain postural movements and configurations (Scheflen, 1963, 1964, 1965; Condon and Ogston, 1966, 1967). It has also been used as the basis of investigations into the organisation of more 'casual' interactions, for instance, a conversation in a pub (Kendon, 1970, 1972) and conversations between friends (Duncan, 1972, 1973, 1974). However, it should be noted that some researchers have employed an adapted version of the original method of context analysis. For example, Duncan and Fiske (1985) assessed the reliability of the relationship between structural elements statistically and also took account of the possibility that the relationship between two actions may be variant, involving an optional sequence of actions. Kendon (1982) has argued that the first stage of analyses should not involve making a transcription. He observed that even when a comprehensive transcription is made, the level of detail embodies implicit assumptions about the nature and kinds of units of behaviour involved. Thus Kendon argues that when a transcript is made it has embedded in it an implicit form of conclusion for the study. In short, Kendon claims no transcription of an interaction is neutral (see also, for example, Butterworth, 1978; Ochs, 1979). To overcome this problem he has suggested that prior to transcription an analyst should examine the materials, develop a conception of the structure involved and make explicit these assumptions, which effectively underpin the investigation. Yet, as Duncan and Fiske (1985) point out, such an approach relies

heavily on the skill and experience of the investigator in perceiving the critical behaviours and may mean that behaviours that are important in the interaction are excluded from the transcript. Consequently Duncan and Fiske remain advocates of the original 'initially-detailed' approach. Thus it can be seen that there are still ongoing debates about how the method of context analysis should be refined.

It is important to note that there is a serious problem with the context analysis approach in general. This revolves around the identification of units into which behaviour is patterned from the continuous stream of action in an interaction. Specifically, researchers using the method of context analysis only check the reliability with which a specific pattern occurs (i.e. is it sustained across other data?). They do not directly check the validity of the units; that is, whether the units described are salient to the participants. It is possible that they actually represent rather idiosyncratic categorizations on the part of the analyst (a claim Beattie (1983, p18) lodges against the scheme developed in Kendon's 1972 investigation). However, this is not always easy to accurately assess since, for example in the case of Scheflen's work the units were rather loosely defined (Butterworth, 1978; Scherer and Ekman, 1982).

In summary, it has been seen that in the past whilst mainstream psychologists, linguists and sociologists have tended to neglect the study of communicational behaviour in *interaction*, there have been a few isolated attempts to try uncover structure which underlies the organisation of behaviour in interaction. However, let us now focus the discussion on one particular structural feature of conversation, whose investigation shall form the basis of the research reported in this thesis - the exchange of speaking turns.

It has been observed that one of the most fundamental, and apparently universal (Miller, 1963), structural features of all conversation is that people take it in turns to talk. Moreover, typically participants achieve a smooth and ordered sequence of turn exchanges with little or no overlap or silence (Argyle, 1967; Sacks, Schegloff and Jefferson, 1974, 1978). Turn-taking is usually effortless and generally taken-for-granted. We often only become aware of this when something unexpected happens to disrupt the interaction. For example, an individual may frequently either begin to start talking whilst another is still speaking or fail to take up the speaking turn. Continual failure to synchronise conversation can lead to interactions becoming awkward and embarrassing, to an individual being regarded as a poor communicator (Wiemann, 1977) and eventually, over a longer period, contribute to an individuals social isolation (Trower, Bryant and Argyle, 1978). Thus the ability to smoothly manage and maintain a conversation is not only of theoretical importance but of critical social importance to an individual. This area of study is also of interest because it has

been approached from a number of different methodological perspectives. In the literature review following this chapter it will be seen that psychologicial investigations of the turn-taking process have tended to involve either carefully controlled experiments or a form of context analysis. These endeavours have, however, been carried out quite separately from the qualitative sociological investigations, carried out in the ethnomethodological tradition. Few attempts have been made to synthesize the results yielding from these two disciplines. It will be argued that these theorectical and methodological divisions between psychology and sociology have actually impeded our understanding of the turn-taking process. It could be ventured that the strengths and weaknesses of these various approaches actually complement each other; for instance, analysis of the organisation of behaviour in context, with consideration given to questions of both reliability and validity, could be usefully combined with a more experimental approach to ascertain, for example, the more general significance or crucial elements of the patterns of behaviours observed. In the course of this thesis an attempt will be made to show how the study of turn-taking can benefit from a eclectical approach. And it will thus be seen that the investigation of the routine process of turn exchange involves important theoretical and methodology issues, the resolution of which have important practical implications.

Chapter 2

Literature Review

Two comprehensive models of turn-taking have been proposed. However, they have been put forward by researchers who have adopted very different perspectives. One account has been offered by a Psychologist - Starkey Duncan - based on the quantitative analysis of video recordings of the regulatory role of particular non-linguistic and kinesic features in a small sample of dyadic conversations. The other account has come from within Ethnomethodology. In contrast to Duncan's model, this account of turn-taking was based on the qualitative analysis of audio recordings of various different types of conversation, ranging from telephone conversations to interactions in a coffee room, and the emphasis is on the the role of language and meaning in turn-taking (Sacks, Schegloff and Jefferson, 1974). In the course of this chapter both of these models will be outlined and discussed in some detail. There have, however, been a number of studies that have focussed on investigating the regulatory role of single kinesic behaviours and these results shall also be discussed. The emphasis of this review (and the research to be reported in this thesis) will be on how the smooth exchange of turns is accomplished in conversation. It will specifically review investigations that attempted to understand how people actually deal with turn-taking. Thus it will not consider those studies that have treated turn-taking as a probabilistic process; that is where investigators have collected information about the temporal patterning of talk (eg. length of silences at the end of a speaking turn) and attempted to derive a model which provides information about the probability of a turn exchange at a particular point in a conversation (for example, Jaffe and Feldstein, 1970; Cappella 1979). We shall start first with a review of the investigations that have examined the regulatory role of specific nonverbal features of dyadic conversation.

2.1. The role of speaker's gaze and other kinesic behaviours in the mediation of the turn exchange process

A number of researchers have observed that during conversation whilst listening, a participant will look at the speaker in long gazes; but whilst speaking they will alternate between gazing at and away from the listener (Nielsen, 1962; Exline, 1963; Exline, Gray and Schuette, 1965; Argyle, 1967). The first study to investigate the possible role of speakers' gaze in regulating the exchange of speaking turns was carried out by

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Adam Kendon (1967). He found that when a speakers' utterance[1] ended with listener-directed gaze on 71% of occasions the listener took over the speaking turn without pausing. However, when an utterance ended without listener directed gaze on 71% of occasions either the listener failed to respond or did not respond at all. Kendon (1967) interpreted these results as suggesting that the direction of speakers' gaze at the end of an utterance provided important information about whether the speaker intended to hand over the speaking turn. However, there are two problems with this study. Firstly, the analysis was based on a restricted sample of conversations (only two out of the corpus of seven conversations were considered, Beattie, 1978a). In addition, these two conversations were not even representative of the other five conversations since these were the only two in which a 'sufficient number of the two kinds of utterance endings occurred to enable a proper comparison to be made' (Kendon, 1973, p83). Secondly, closer scrutiny of Kendon's (1967) results revealed that listener-directed gaze was neither a totally effective or necessary cue (Beattie, 1978a). For on 29% of occasions when speakers utterance terminated *with* listener directed gaze the listener did not immediately take over the speaking turn. Conversely, on 29% of occasions when the preceding utterance terminated *without* listener directed gaze the listener took over the turn immediately (Beattie, 1978a). Thus it can be seen that listener-directed gaze does not appear to be essential in the turn exchange process. Nevertheless, Kendon's (1967) study has had a great impact on research in this area - as a consequence the importance of gaze in regulating exchange has been investigated, using both observational and experimental approaches. Let us first consider the observational studies.

A series of observational studies have investigated the role of listener-directed gaze in naturalistic situations. These studies have, however, failed to provide unequivocable support for Kendon's (1967) claim that listener-directed gaze plays a crucial role in regulating the turn exchange process. For instance, Duncan (1972) found that listener-directed gaze did not differentiate exchanges that were 'smoothly' executed from ones that involved a simultaneous claim for the turn, although it was later found that it facilitated a smooth exchange (Duncan, Brunner and Fiske, 1979).

Rutter, Stephenson, Ayling and White (1978) found that the regulatory function of gaze was subject to external influences. They observed that it seemed to play a more important regulatory role when strangers were conversing than when friends were conversing and similarly for competitive versus co-operative tasks, respectively. But

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1. In Kendon's original paper he did not define the term utterance. However, later it was defined as a stretch of speech (i.e. a speaker turn) that was complete in both from and content and that was marked by a change in topic (Kendon, 1978).

they qualified these findings by noting that if listener-directed gaze was to be effective in triggering an exchange of turns then the listener must perceive the speakers' gaze. However, they found that in some conversations at the ends of speaking turns as little as 50% of gaze was mutual, that often the listener was found to be looking elsewhere (an observation also reported by Duncan and Niedereche, 1974).

Beattie (1978a), however, carried out a more direct test of Kendon's work on a sample of dyadic tutorials. He suggested that if listener-directed gaze does perform a regulatory function then its presence at the ends of utterances that are syntactically and semantically complete should reduce the succeeding switching pause. Yet the results of this particular investigation provided no evidence that listener-directed gaze functioned in this way. In a later study, however, Beattie found (1978b) that listener directed gaze did significantly decrease the magnitude of switching pauses when it occurred during hesitant periods of speech (that is speech which involves a high pause/phonation ratio). In addition, he observed that these hesitant or planning phases were characterised by high levels of speakers gaze aversion (see also Kendon, 1967)[2]. Beattie (1981a) suggested that perhaps gaze was salient in mediating exchanges in conversational contexts that were characterised by a low-level of gaze. Moreover, he suggested that this could explain why his first study failed to replicate Kendon's (1967) observations since overall in his study there were much higher levels of gaze (67% compared with 49% in Kendon's study). In short, Beattie predicted that the importance of listener-directed gaze in regulating turn-taking would vary according to the background level of gaze in a particular interactional situation. Indeed Kendon (1978) suggested that such factors may well turn out to be 'overwhelming' in determining whether gaze (or any other aspect of behaviour) is used to apportion speaking turns. Of course situational factors need not be relational but have been found to involve such contingencies as the number of people conversing (Harrigan and Steffen, 1983) and/or the prevailing lighting conditions (Martin and Jones, 1982). In other words, the use of listener-directed gaze to trigger an exchange of turns may also depend on whether a speaker believes that the other participants will perceive their direction of gaze. But what happens to the management of conversation when the interactants are in a situation that prevents eye-contact when, for instance, they are conversing on the telephone?

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2. Beattie (1983) has demonstrated that the patterning of certain aspects of nonverbal behaviour (gaze and gesturing) are related to the planning units underlying spontaneous speech. Whilst I acknowledge the fundamental role cognitive processes may have in shaping behaviour in conversation detailed consideration of this issue is beyond the scope of this research.

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A number of researchers have attempted to assess the importance of gaze in regulating speaker turns by examining the temporal structure of conversations conducted when the interactants are deprived of visual information; for example, when subjects were separated by a barrier (Jaffe and Feldstein, 1970; Cook and Lalljee, 1972; Rutter and Stephenson, 1977; Butterworth, Brady and Hine, 1977) or talking via an intercom (Butterworth et al., 1977) or talking on the telephone (Beattie and Barnard, 1979). In these studies the length of pauses and/or frequency of interruptions were used as indicators of disruption. From Kendon's (1967) work it would be predicted that in audio-only conversations the elimination of gaze would impede the exchange of turns resulting in an increase in the magnitude of switching pauses. However, not all studies considered this parameter. Of those that did, none of them found a significant difference between audio-only and face-to-face conversations in the duration of switching pauses (Butterworth et al, 1977; Rutter and Stephenson, 1977; Beattie and Barnard, 1979). For the other measure of disruption - interruption - it was found that the levels were lower in audio-only conversations than in face-to-face conversations (Jaffe and Feldstein, 1970; Cook and Lalljee, 1972; Rutter and Stephenson, 1977; Beattie and Barnard, 1979). It was conjectured that perhaps visual communication helped to maintain the interaction, enabling participants to converse spontaneously and interrupt freely without threatening a breakdown in communication (Rutter and Stephenson, 1977) but this hypothesis was not confirmed by a later investigations, which found that high levels of interruption were related to physical presence rather than visual communication (Williams, 1978; Rutter, Stephenson and Dewey, 1981). However, it should be noted that the results of these studies on the use of interruptions should be treated cautiously because the measures of interruption they actually employed are unreliable for several reasons, which will be discussed below.

Firstly, it has been argued that the topics of conversation in the studies prior to 1979 were arbitary and rather artificial (Beattie and Barnards, 1979[3]). For instance, in two studies unacquainted subjects were asked to resolve differences in attitude that had been tapped in a questionnaire (Jaffe and Feldstein, 1970; Rutter and Stephenson, 1977). It is possible that such contrived situations generated anxiety in the subjects. It has been found that anxiety is inversely related to the use of interruptions (Natale, Etin and Jaffe, 1979). It is therefore possible that in the early studies, because the levels of interruption were generally depressed by anxiety, there was no difference between these two conditions. Secondly, in all the studies interruption was defined on the

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3. In their own study they attempted to overcome this limitation by examining naturally occurring conversations. In other words, conversations that would have occurred even if they had not been observing them.

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basis of simultaneous speech[4]. However, it has been pointed out that not all interruptions involve simultaneous speech and that on some occasions a listener will seize the speaker turn whilst a speaker is pausing (Beattie, 1983). Thirdly, in the early studies the definition of interruption included all instances of simultaneous speech (Jaffe and Feldstein, 1970; Cook and Lalljee, 1972). Yet not all instances of simultaneous speech represent claims for the speaker turn (Beattie and Barnard, 1979; Beattie, 1981b). Some are brief verbal responses or attention signals given by the listener (such as 'I know' and 'Yeah'), which serve to encourage the speaker to continue talking; such remarks have been variously termed *'accompaniment signals'* (Kendon, 1967), *'listener responses'* (Dittmann and Llewellyn, 1967) and *'back channel behaviours'* (Ygnve, 1970; Duncan, 1972, 1973, 1974). Thus it can be seen that these studies did not provide an accurate measure of the level of interruption.

All of these studies (with the exception of Jaffe and Feldstein, 1970) considered the possibility that in audio-only conditions the use of verbal 'cues' may increase to substitute for the loss of gaze. It has been suggested that filled pauses (FP), such as 'err', and 'umm', act to maintain the speaking turn for short periods (Maclay and Osgood, 1959; Ball, 1975), up to 600 milliseconds (Beattie, 1977). They follow unfilled pauses (UFP) and indicate that the speaker has not in fact finished talking but is planning what to say (Rochester, 1973)[5]. It has been emphasized that because the hypothesis states that FP occur in response to UFP in order to assess the importance of FP it is necessary to control for the number of UFP (Beattie and Barnard, 1979; Beattie, 1981a). However, as Beattie and Barnard point out all the other investigations compared the incidence of FP's in audio-only and face-to-face conversations by relating FP's to the number of words spoken. Only in their study was this measure computed correctly wherein they found that the FP/UFP ratio increased significantly during telephone conversations as compared to face-to-face dyadic tutorials. However, the results of this study are inconclusive because the significance could have arisen either as a consequence of the differences between conversations conducted in vision and no-vision conditions (the interpretation Beattie and Barnard give) or as a consequence of the fact that they happened to analyse face-to-face conversations where gaze was a salient turn-taking cue. For instance, from earlier work it is known that in dyadic tutorials in *some* cases listener-directed

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4. However, it should be noted that in Beattie and Barnard's study it is not clear what criteria they used to operationalise interruptions since they use the phrase 'simultaneous claims for the turn' but fail to define this phrase.
5. It should be noted that two experimental tests which have failed to confirm this turn holding function (Lalljee and Cook, 1969; Cook and Lalljee, 1972) have serious methodological weaknesses (see Beattie, 1977).

gaze is a salient turn-taking cue (Beattie, 1978b). Therefore one would not expect a high level of FP's. However, it is also known that in dyadic tutorials gaze is not always important in mediating turn exchanges (Beattie, 1978a). In these conversations FP's may be used more frequently and may not differ significantly from those used during the telephone conversations. Thus it is not clear whether the interactants used less filled pauses in the face-to-face interactions because they were able to use gaze as a turn-taking cue or because they were in a situation where the low-level of background gaze meant it was salient in turn exchange.

In summary, it has been seen that the regulatory function of listener directed gaze may depend on the background levels of gazing. Studies of audio-only conversations have clearly demonstrated that it is not crucial in regulating the exchange of speaker-listener roles. Of course in these audio-only conversations interactants were also deprived of other kinesic information but interestingly none of these investigations attempted to control for the effect of the loss of gaze from the loss of other visual information (Beattie, 1981a). But what other kinesic behaviours (besides gaze) perform a regulatory function?

Information about the role of other kinesic behaviours in turn-taking is fragmentary. However, even a casual observer of conversation can see that a speaker will often move whilst talking. In particular, they will gesticulate, even if they can not see their interlocutor (Cohen, 1980). There is evidence that gesticulation is a by-product of planning speech (Dittmann and Llewellyn, 1969; Butterworth and Beattie, 1978; Beattie, 1983) but it can also be used to regulate the exchange of speaker-listener roles (see, for example, Ekman and Friesen, 1969). For instance, it has been found that gesture maintenance acts to preserve a speaker turn and that its termination serves to mark the end of a speaker turn (Duncan, 1972, 1973, 1974). DeLong (1974, 1975) has observed that in pre-school children a leftward movement of the head marks the termination of an utterance. It has also been claimed that in adults postural shifts may play an important role in marking the end of a turn; for example, a speaker may lean back in their chair when they have stopped talking (Kendon, 1970; Wiemann and Knapp, 1975). However, since it has been found that individuals vary considerably in the amount they move and gesticulate (see for example, Dittmann and Llewellyn, 1969; Dittmann, 1972) and, in addition, that some individuals in some conversations do not gesticulate at all (Wiemann and Knapp, 1975; Rosenfeld, 1978; Beattie, 1981a, 1983) this suggests that this information is not of fundamental importance in the management of the turn-taking procedure. Moreover, none of these investigators actually demonstrated that these behaviours affected the transfer of speakership (Beattie, 1981).

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In summary, our understanding of the regulatory role of nonverbal behaviours in conversation has been advanced by a large number of studies. However, the fact that conversations can and do proceed smoothly without the aid of visual information (for example, on the telephone or in the dark) demonstrates that this sort of information is not crucial to the smooth organisation of conversation (Beattie, 1983). Furthermore, it suggests that information in the verbal channel plays a more fundamental role in the turn-taking process.

So far the focus has been on the role of speaker in the turn-taking process but what role does the listener play in this process? We shall now briefly review those investigations that have attempted to examine the role of listeners' behaviour in the turn-taking process.

2.2. The role of the listener in mediating an exchange of turns

The regulatory role of the listener has been somewhat neglected and yet when it comes to the question of where turns are to be exchanged the listener is not at the mercy of the speaker (Wiemann and Knapp, 1975). Listeners will often communicate their desire to speak and concomitantly will indicate that they do not intend to speak and want the speaker to supply further information (Rosenfeld, 1978). But how do they do this?

Perhaps one of the most obvious ways in which a listener may request an exchange is by briefly opening and/or closing their mouth as if they intend to say something but without actually uttering anything (Heath, 1982). However, it has been suggested that a listener can enlist a variety of other techniques, some of which involve engaging in simultaneous speech, but which more frequently involve specific nonverbal behaviours, namely speaker-directed gaze and head nodding (Wiemann, 1973; cited Wiemann and Knapp, 1975). In another study it was found that the co-occurrence of head nodding with a verbal back channel response was often followed by an exchange of turns (Dittmann and Llewellyn, 1969). It has also been posited that a speakers' decision to relinquish the speaker turn may be influenced by a listener indicating their intention to speak by engaging in 'speech preparatory' movements (Kendon, 1970, 1972; Wardbough, 1985). It has been hypothesized that such pre-speech movements provide information about the length of the speech unit to follow - specifically the more extensive the repositioning the longer the speech unit (Kendon, 1970, (but as Beattie, 1981a observes he did not actually test this hypothesis)). Furthermore, the particular configuration of the pre-speech movement may be related to the type of unit to follow (Thomas and Bull, 1981) For instance, raising of the head has been found to be associated with asking a question (Thomas and Bull, 1981). However, it is important to note that pre-speech movements have

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also been found to occur prior to back channel responses by the listener (Harrigan, 1985). In Harrigan's study it was found that 54% of such responses were preceded by listener movement compared with 88% in the case of speaking turns. This finding must clearly call into question whether pre-speech movements are actually regarded by speakers as a reliable indication that the listener desires to talk because when they occur they could be simply 'signalling' the onsett of a back channel response. Also it is important to note that none of these studies demonstrated a causal link between these turn requesting behaviours and the speakers' decision to relinquish the turn.

Another way that listeners' can influence turn-taking is by giving the speaker feedback that leads them to modify the course of their speaking turn and hence the placement of the exchange. For instance, it has been found that certain facial movements, namely raising eye brows or frowning, can lead a speaker to reiterate or change a point (Wiener, Devoe, Rubinow and Geller, 1972). Birdwhistell (1970) claimed that different forms of listener head nods affected speakers talk (see also Rosenfeld, 1972). For example, he found that a double head nod either elicited an elaboration of an earlier substantive point or caused modification in the rate at which the speaker was talking. Relatively long lasting head nods were found to disrupt the speakers' talk and lead them to justify an earlier point. Triple head nods caused the speaker to hesitate and in some cases stop talking altogether. Another researcher has found that the co-occurrence of a series of slow head nods and the withdrawal of gaze is interpreted as indicating that the listener does not want to exercise their option to speak but has 'disengaged' from the interaction (Goodwin, 1981). Withdrawl of gaze alone may be regarded as a sign that the listener is not in fact listening since direction of looking is often taken as an indication of focus of attention (Argyle and Dean, 1965; Goodwin, 1981; Heath, 1984). On such occasions a speaker may repeat what they have said (that is restarts, Goodwin, 1981) or gesture to regain the listeners attention (Heath, 1982, 1984).

In summary, it can be seen that these investigations have suggested that a listener can affect the turn-taking procedure mainly by the use of various nonverbal behaviours. However, it should be stressed that none of these studies have actually demonstrated that the listener behaviour actually influences the speakers' decision to relinquish the speaking turn. It can be argued that it is difficult to place these investigations in the perspective of the turn-taking procedure since we do not have a firm grasp of how a speaker indicates their intentions with respect to the speaking turn and consequently at what points in the conversation the listeners' responses would play a significant role in this process. Duncan (1972, 1973, 1974) has, however, attempted to provide an integrated account of the role of both speaker and listeners in the turn-taking process. We shall now consider this model in some detail.

2.3. Duncan's Psychological model of turn-taking

Arguably one of the most important contributions to our understanding of turn-taking has been made by Duncan and his co-workers, who have sought to identify the verbal and nonverbal signals and interactional rules that govern the regulation of speaking turns (Duncan, 1972, 1973, 1974, 1980; Duncan and Fiske, 1977, 1979, 1985; Duncan, Brunner and Fiske, 1979; Duncan and Niedereche, 1974). In other words, they have attempted to develop a 'grammar' of interaction, which outlines the procedures by which a) smooth exchanges are accomplished, b) information is exchanged about the current status of the speakers message and c) a listener indicates that they are following what the speaker is saying. They argue that these three parts of the turn system are systemmatically related to each other and all are crucial to achieving and maintaining the co-ordination of the participants actions. (You will recall in chapter 1 that it was noted that Duncan's particular structural approach was based on the method of context analysis, which was developed by Scheflen, Birdwhistle and McQuowan).

The starting point of this research involved the extensive transcription of all speech, intonation, paralanguage and body motion that occurred in two 19 minute dyadic conversations, involving three speakers. (One of the interactions involved a conversation between a male therapist and a young female client and the second involved the same male therapist conversing with a close friend, who was also an experienced therapist.) From this Duncan (1972) identified 7 discrete, independent signals that were implicated in the turn exchange process:

1) *Intonation* - any contour pattern in which there is a deviation from from sustained pitch, also known as 2:2 (Trager and Smith, 1951) during a phonemic clause. A phonemic clause is defined by Trager and Smith (1951) as containing one primary stress and one terminal juncture, which can be either rising, falling or sustained.

2) *Syntax* - completion of grammatical clause. Originally this was defined as a clause involving a subject-predicate combination (see for example Duncan, 1973, 1974; Duncan and Fiske, 1977). However, later the definition was expanded and made more explicit. Three types of grammatical completion, that were components of the basic definition, were distinguished. These were as follows

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(see Duncan and Fiske, 1985, p54-56):
a) phrases or dependent clauses that follow independent clauses but which were not presupposed by a preceding clause,   b)   independent clauses and subsequent independent clauses that were linked by a relative pronoun, and c) elliptical utterances, such as the reply 'Chicago' to the question 'Where 're you from originally?' (example taken from Duncan and Fiske, 1985, p56).

3)   *Sociocentric sequence* -   the use of a stereotyped expression such as 'you know' and 'or something' etc.

4) *Decrease pitch/loudness#* -   that occurs in conjunction with a sociocentric sequence.   The decrease was compared with the pitch/loudness of the syllable(s) immediately preceding the sociocentric sequence.

The display of this cue dependant on the use of cue 3. It is for this reason that cue 4 has recently been dropped from the set of turn-yielding cues (see Duncan and Fiske, 1985).#

5)   *Drawl*   -   distinct lengthening of either the final syllable or the stressed syllable of a terminal clause.

6)   *Gesture* -   the termination of any hand gesticulation or the relaxation of any tensed hand position, such as a fist but excluding self- and object adaptors (Ekman and Friesen, 1969). This cue was not considered to be displayed unless both hands were at rest and relaxed following the gesture or tensed hand position.

These signals (1-6) were found to mark the ends of speaking turns and were termed 'turn-yielding cues'.   However a cue that prevented turn-taking from occurring was also identified. It was called an 'attempt-suppressing cue'.

7) *Gesticulation* - one or both hands engaged or in tensed hand position.

Duncan realised the significance of these behaviours listed above by segmenting the speech stream into smaller units, which were between two and five syllables long. These units were termed 'units of analysis'. They were defined as the ends of

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phonemic clauses that were additionally marked by the display of at least one turn-yielding cue and/or by the display of at least one of the following actions:

1) unfilled pause,
2) false start,
3) audible inhalation,
4) speaker shifts head towards listener,
5) a drop in pitch and/or loudness during or at the end of a phonemic clause,
6) relaxation of foot.

This segmentation was crucial to Duncan's analysis as it enabled him to know not only how many times a given behaviour occurred but also how many times it did not occur. Thus Duncan (1972) correlated the number of turn-yielding cues conjointly displayed at units of analysis with the probability of a listener attempting to take the speaker turn and found that there was a significant, positive correlation. In other words, Duncan found that there was a positive linear relationship between the number of turn-yielding cues conjointly displayed and the likelihood that the listener would act to take the speaker turn. In addition, it should be noted, that he found that the display of one or more turn-yielding cues resulted in a significant increase in the probability of a smooth exchange occurring (although this result was unreported in Duncan's original paper, 1972 but see Duncan and Fiske, 1977, p195).

On the basis of these results Duncan developed a set of rules which described how the exchange of turns was mediated. He proposed that the speaker could use the turn-yielding cues to indicate their inclination (or lack of) to move to the listener role - in short their degree of *transition readiness*. Specifically, as each turn-yielding cue was deemed to carry equal weight, by 'activating' or not 'activating' these cues a speaker could indicate their transition readiness on an ordinal scale from 0 to 6. Within this system activating the gesticulation signal was regarded as indicating a negative value of transition readiness. It was hypothesized that transition readiness was a 'single state that was continuously operative throughout the interaction' (Duncan and Fiske, 1985, p50). An important feature of this model was that the listener was regarded as having the *option* to respond:

> 'The auditor is not obliged to take the turn when the signal is displayed. Rather, the signal is hypothesized to mark points in the stream of interaction at which the auditor may appropriately act to take the turn if so inclined. That is, optionality is an important aspect of the signal. For this reason, we said that the signal has to do with the *optional*, as opposed to *obligatory*, response by the auditor.'
> (Duncan and Fiske, 1985, p45.)

Furthermore, it was suggested that a listeners' willingness to respond to the speakers display may vary according to a number of factors, such as the participants interactional style, the nature of the participants relationship and the nature of the conversation.

> 'For example, one participant as auditor might aggressively leap at the slightest indication (for example, the switching on of a single turn cue) that the speaker is prepared to yield the speaking turn. Another participant might tend to defer an attempt to take the turn until there is a clear and perhaps repeated switching on of three to five cues. Thus, the correlations have the potential for reflecting more that the way that participants operate within the general turn system, than the way that system is organised.'
> (Duncan and Fiske, 1977, p195.)

Duncan stipulated that if the listener did respond to the display of one or more turn-yielding cues then the speaker was obliged to relinquish the speaker turn immediately. However, when taking over the turn the 'new' speaker must ensure that they do not speak simultaneously or 'overlap' the end of the prior speakers turn. Any instance of simultaneous speech was treated as an instance of simultaneous turns and a temporary breakdown of the system. Typically it was found that breakdowns occurred either a) when the listener attempted to take the turn in the absence of a turn-yielding cue or whilst the speaker was gesticulating or b) when the speaker failed to relinquish the speaker turn after displaying at least one turn-yielding cue. However, it should be noted that there were several exceptions to this no-simultaneous speech rule. Thus simultaneous speech arising from a previous speakers use of a) FP b) audible inhalations c) sociocentric sequence d) back channel response were not treated as a breakdown in the system.

It is worth noting that this set of signals and rules was later tested on a set of six dyadic conversations (Duncan and Fiske, 1977, 1985) and that this subsequent investigation corroborated Duncan's (1972) original findings.

Following the completion of the work described above Duncan and his co-workers addressed the question of how a listener indicated their intention to respond to the turn signal and thereby indicate that the speaker should relinquish the turn. In other words, how did the first speaker distinguish verbalisations arising from a listeners' claim to the turn from a back channel response? Exploratory analysis lead to the hypothesis that a 'speaker-state cue' marked the beginning of speaker turns and thereby distinguished them from back channel responses (Duncan and Niederehe, 1974). The cue was defined as the display of at least one of a set of four behavioural cues, which were as follows:

1. Shift away in head direction from directly pointing at the speaker. The cue was based on a shift in head direction and not just the prevailing head direction.

2. Initiation of gesticulation (excluding self- and object-adaptors) after having had both hands at rest.

3. Audible inhalation involving a sharp intake of breath.

4. Paralinguistic overloudness or 'overloud intensity'.

In the exploratory study it was found that at least one of these behaviours marked 95% of turn beginnings but only 19% of back channel responses. In a replication study the corresponding figures were 72% and 9%, respectively. However, in this later study it was found that the first two cues showed the strongest results both individually and as a two-cue set. As a consequence of this result, for the sake of parsimony only the first of the two cues listed above were treated as components of the speaker-state cue. Thus when at least one of these behaviours was 'switched on' the listener was said to have claimed the speaker turn. It was proposed that the use of this cue may be influential in resolving simultaneous claims for the speaker turn in favour of the second speaker. It was found that the outcome of such a 'clash' could be predicted by assigning plus one for the display of each speaker-state cue and minus one for the display of each turn-yielding cue, where the participant with the greatest sum gained the turn.

In short, it was proposed that through the proper use of turn-yielding cues and speaker-state cues the participants were able to collaborate to ensure the smooth exchange of turns. This sequence of co-ordinated behaviours was thus regarded as providing the 'structural building blocks' out of which *speaker-turn units'* were created (see for example Duncan and Fiske, 1977, p236, 1985, p44).

With this part of the model complete, attention was turned towards exploring speaker-listener interactions during the course of the speaker turn. Specifically, Duncan and his associates sought to discover whether, within the structure of a turn of talk, there were interactions between speaker-listener that created boundaries that were analogous to those created by the co-ordinated sequence of speaker-listener behaviours at the end of speaking turn. In other words, they asked, does a speaker mark places in a turn as appropriate for the listeners to give a back channel response (see Duncan, 1974; Duncan and Fiske, 1977, 1985)?

Analysis of the original transcripts revealed that there were indeed certain regularities in the speakers' behaviour during the course of a speaking turn. For instance, it was observed that at or near the begining of a unit of analysis, a speaker would often turn

their head away from the listener. This behaviour was described as a *'speaker continuation signal'* and it was regarded as marking a new unit within a single turn. At the end of a unit of analysis it was found that typically a speaker would display at least one of the following two behaviours: a)   completion of grammatical clause and/or b)   turning head towards listener. These behaviours were thus termed *'speaker within-turn signals'.*   But how did the use of these signals relate to the listeners' use of a back channel response? Duncan considered the possibility that different types of back channel responses may differ in their significance and hence in the way in which they relate to these speaker signals.   Thus the first stage of the analysis was directed towards investigating whether various types of back channel responses differed in their distribution across units of analysis.   Duncan and Fiske (1985; Duncan 1974) distinguished 6 different forms of back channel responses. These were as follows:

1. *M-hm* - this includes other verbalisations such as 'yeah', 'right', 'yes quite' and 'I see' (see also Kendon, 1967; Yngve, 1970).   These were used either singly or in combinations.

2. *Sentence completion* - in such cases the listener would complete the speakers' sentence but not continue. The original speaker would resume their turn as if they had not been interrupted. For example:
   'S: eventually it will come down to more concrete issues, A: as she gets more comfortable; S: and I felt that....'
   (taken from Duncan, 1974, p166).

3. *Request for clarification* -   usually very brief questions.

4. *Brief restatement* - restates the speakers' preceding thought.

5. *Head nods and shakes* - used or alone or in conjunction with a verbalised back channel response.   These head movements may vary from, for example a single nod to a series of nods.

6. *Smiles* - this behaviour is a recent addition to the list (see Duncan and Fiske, 1985).   It should be noted that the results described below are those from the initial investigations and therefore exclude consideration of this particular response.

For the purposes of this analysis four locations were identified:

1. *Postboundary* - back channel occurs on or just after the first syllable of the following unit of analysis. As Duncan treated the onset of a back channel response as being related to the boundary of the unit of analysis preceding it, a back channel response that occurred in postboundary location was regarded as a 'late' response.

2. *Speech overlap* - back channel overlaps with speakers' substantive speech (i.e. excluding sociocentric sequences), but excluding those syllables of this speech that fall under category one.

3. *Sociocentric sequences* - back channel overlaps with speakers' use of sociocentric sequences, or occurs in a pause that precedes the use of such a sequence. Back channel responses that occurred at this location and at location 2. were sometimes termed 'early' responses (see Duncan and Fiske, 1977, p209, 225 for detailed explanation of this terminology).

4. *Pause* - back channel occurs during brief pause between the final syllable of a unit of analysis and the first syllable of the preceding unit.

An exploratory and replication study showed that the various types of back channel responses did not differ in their distribution across the units of analysis. Thus, in the next stage of the analysis, when investigating the relationship between these responses and the speakers within-turn and continuation signals, back channels were treated as one class of behaviours.

When the relationship between the speakers signals and listeners back channels was examined in an exploratory study two interesting patterns emerged. It was found that early back channel responses significantly increased the probability of the use of a speaker continuation signal. This result obtained regardless of whether the speaker had displayed a within-turn signal. (It should be noted that early back channel responses often occurred before a speaker within-turn signal). In contrast, when responses occurred during a pause the probability of a speaker continuation signal only increased significantly when it was preceded by a speaker within-turn signal. However, it was also found that in most cases such back channel responses were preceded by a within-turn signal. Duncan (1974; see also for example Duncan and Fiske, 1977, 1979) interpreted these results as indicating that *'within-in turn interaction units'* could be created in one of two ways. One involving an ordered sequence of two actions - an early back channel response followed by a speaker continuation signal - and the other involving an ordered sequence of three actions - a speaker within-turn signal followed by a back channel response (but not an early one),

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which is then followed by a speaker continuation signal. Duncan (1974; Duncan and Fiske, 1977) speculated that the precise placement of back channel responses may provide the speaker with important information about how well their message is being received, and that as a consequence of this feedback, the speaker may make adjustments to the way they are relating their message and hence alter the placement of a turn exchange. For instance, Duncan suggested that an early back channel response may indicate that the listener is following and anticipating the message so the speaker may proceed directly onto the next within turn unit, indicating this intention by using a speaker continuation signal. Alternatively, a back channel response in pause position may indicate that the listener is following the speakers message as it develops. This is therefore unlikely to affect the likelihood of a continuation signal. In short, he provided evidence of active negotiation between speaker-listener concerning the course of the interaction.

It can thus be seen that Duncan's model of turn-taking is based on the assumption that the smooth organisation of conversation involves the collaborative action of both speaker and listener. However, it is important to note that Duncan and his associates argue that conventions produce the regularities in behaviour they observed. These regularities of the system reflect the fact that in a particular situation there is a preferred solution to the problem of coordinating the speaking turns of the two participants; the interaction is said to be governed by particular conventions (or rules). These conventions, it was argued, are established and maintained through the coordination of the expectations of the participants conversing. Thus in a particular situation each participants expects the other to take a certain course of action. They emphasize that such expectations or conventions may vary according to the culture or sub-culture to which a participant belongs and, in addition, according to the situation they find themselves in. In other words, a particular turn-taking convention may be used either generally or locally (see Duncan and Fiske, 1977, p270-272 for a more detailed exposition of this distinction)[6]. As a consequence Duncan and Fiske (1985, p62-3) argue that the degree to which their model applies to other conversations is strictly an empirical issue. Moreover, they point out that if a researcher should find results that are discrepant with their model it does not necessarily follow that one of the studies is 'wrong' but may mean that the participants observed were following different conventions.

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6. There is evidence to support this view. For instance, it has been found that the nature of the tonal inflection marking the ends of speaking turns varies according to socioeconomic groupings (Robbins, Devoe, Wiener, 1978) and according to whether the speakers are black or white (LaFrance, 1974).

In conclusion, there can be no doubt that this model is very comprehensive, involving many years of extensive and painstaking research it has provided a vital contribution to our understanding of the turn-taking process. Essentially it has involved a structural study of the turn exchange system, outlining turn-taking cues that are displayed by speakers and listeners and rules which determine the appropriate response to these cue displays. It is thus based on a conceptualisation of interaction as an integrated and organised process, involving elements whose use is governed by a set of conventions or rules about appropriate behaviour in a particular setting. Importantly, however there are number of shortcomings in the analysis of the data and, in addition, several flaws in the formulation of the concepts that underpin the model. We shall first consider the methodological problems.

2.3.1. Methodological problems of Duncan's model of turn-taking.

The first problem relates to the way speech was transcribed. It has been pointed out that this was done with full reference to the discourse context and that therefore it is possible that the record of the prosodic features was affected by the syntax and content of the utterance and in addition by its known position within the discourse (Cutler and Pearson, 1985). Such influences may be particularly worrying in the case of drawl as this term was not strictly defined by Duncan (Cutler and Pearson, 1985). It seems likely that judgements about the presence of drawl were made simply on the basis of a subjective impression of whether the phrase-final lengthening was greater than expected (Cutler and Pearson, 1985). Yet Duncan and Fiske (1977, the first publication that reported any inter-observer reliabilities) do not report whether any reliability checks were carried out on these judgements. The results of checks carried out on the transcription of other turn-yielding cues were, however, reported (Beattie, 1981a) although no information was given about the judges (Beattie, 1981a) or how the procedure was carried out. It is therefore impossible to assess the reliability with which prosodic transcriptions, that formed the basis of this model, were made. This particular issue will receive further attention in chapter 5.

The second problem concerns the statistics used in the exploratory study to investigate the relationship between the number of turn-yielding cues conjointly and the probability of an attempt by the listener to take the speaker turn. What Duncan did was to carry out a correlation on these two events (you will recall the result was highly significant). However, Beattie (1981a) has pointed that this correlation is very unreliable because only on two occasions were 6 turn-yielding cues conjointly displayed. Furthermore, only on one occasion did the listener take over the speaker turn in response to this display. Beattie noted that if this responses had not occurred the correlation would have been non-significant and the percentage of turn-taking

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attempts in response to a six-cue display would have fallen from 50% to 0%. Wilson, Wiemann and Zimmerman (1984) have also pointed out that the results of the replication study show that an increase in the number of turn-yielding cues conjointly displayed actually served to decrease the probability of a turn-taking attempt by the listener (see Duncan and Fiske, 1977, Table 11.4). Rosenfeld (1978) has suggested that in these investigations a more accurate picture of the effect of the number of cues would have been given by looking at the increases in the number of turn-taking attempts (or prediction of these attempts) that occurs for example between one and two cues and between two and three cues. However, from Beattie's (1981a) observations alone it can be seen that the linear relationship between the number of turn-yielding cues conjointly displayed and turn-taking attempts is unreliable.

A third shortcoming of the analysis is that the correlation discussed above only gave information about the gross efficiency of the turn-yielding cues (Beattie, 1981a). It did not provide information about the relative importance of the different turn-yielding cues (Beattie, 1981a). In addition, Duncan has been criticised for not giving information about magnitude of switching pauses since this means it is not possible to assess whether these turn-yielding cues actually accelerated the turn-taking process (Beattie, 1981a). In order to get information about the relative importance of each of these turn-yielding cues Beattie (1981a) attempted to replicate Duncan's observations using a sample of six dyadic tutorial sessions. Beattie found that the turn-yielding cues differed in the frequency with which they were associated with smooth speaker switches. Typically (that is on 47% of occasions) these locations were marked by three turn-yielding cues - clause completion, a change in the intonation contour and by drawl on the final or stressed syllable. Gesture, in contrast, was only implicated in 9% of smooth switches and on 80% of these occasions it was accompanied by clause completion. Beattie concluded that whilst the cues Duncan identified were important in turn-taking, they were important in the way they operated in special cue combinations. In other words, he challenged Duncan's linear model. Importantly, these observations and conclusions were corroborated by the findings of a similar study carried out by Roth (1981). The importance of clusters of turn-yielding cues in marking turn endings is investigated in chapter 4.

2.3.2. Conceptual problems of Duncan's model of turn-taking

In the course of this section it will be argued that there are a number of conceptual problems associated with Duncan's model of turn-taking. It will be suggested that that these problems include difficulties with: a) the way Duncan segmented the speech stream into units of analysis; b) the idea that the behavourial regularities he identified are signals c) the limitations of a model based on the particular type of 'signals'

identified; d) the definition of simultaneous turns employed; e) the empirical status of the model.

a) The search for valid units of analysis is an important issue in behavioural analysis (Condon and Ogston, 1967; Goodwin, 1981; Ellis and Beattie, 1986). However, as Duncan and Fiske clearly acknowledge it is difficult to find relevant units of behaviour for as they observe:

> 'In exploratory research, the definition of units of analysis is a paradoxical process. One wishes the units to be as relevant to the interaction phenomena to be analyzed, but these phenomena are precisely what is not known, remaining to be discovered. This is clearly a point in the exploratory-research process where the intuition, common sense - and luck - of the investigator are at a premium.'
> (Duncan and Fiske, 1985, p97-8.)

Duncan and Fiske admit that their choice of units was not 'elaborately rationalised' (Duncan and Fiske, 1977, p168). Furthermore, they make it clear that they chose to segment the speakers' talk into units to aid analysis (i.e. so that it is possible to count how often an action did/did not occur) and that the selection of these particular units did have any theoretical basis. In short, Duncan and Fiske state that their units of analysis do correspond to units that actually segment the interaction[7] (Duncan and Fiske, 1977, p165). The problem with Duncan's analysis is that information about how complete utterances within a turn are marked is lost amongst information about how other units of analysis are completed. From the two examples given below it can be seen that a large proportion of boundaries of unit of analysis (marked by '^' and '*') do not correspond with possible completion points:

a) she felt like she didn't have to sustain the relationship she could that somehow when ee
                             ^   ^

   you know you're f you're like how would I put that
   ^   ^   ^   ^

b) there've sorta been subtle hints that she's going to ask but once I respond uh then she
          ^   ^   *   ^

   seems to go on and uh
               ^

(taken from Duncan and Fiske, 1977, p170.)

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7. This is not the case for the phonemic clause, on which the concept of the unit of analysis is based. For instance, there is evidence that a listeners' responses, namely back channels and head nods, are organised around the phonemic clause (Dittmann and Llewellyn, 1967, 1968). It should be noted however that the duration of a units of analysis is longer than a phonemic clause (see Duncan and Fiske, 1977, figure 10.1, p170).

I would like to suggest that whilst the boundary marked by '*' marks a possible completion point the boundaries marked by '^' do not. However, by combining the observations from these within turn locations it is not possible to tell how grammatical boundaries within a turn are marked and distinguished from those at the end of a turn. Duncan reports that listeners do not always respond to the display of turn-yielding cues; for example they only responded on 17% of occasions to two-cue displays and on 33% of occasions to three-cue displays. Whilst it may be the case that the listener was simply exercising their option not to take the turn it may also be the case that the features Duncan identified may mark grammatical boundaries generally irrespective of their placement within a turn of talk. Duncan did not check this possiblity by seeing if there was an association between the number of turn-yielding cues conjointly displayed and the number of times a listener did not attempt to take the turn. Duncan seems to incorrectly interpret the significant association between the turn-yielding cues at the ends of turns and listeners turn-taking attempts as causal. His analysis does not preclude the possiblity that other factors may have intervened in this relationship. In short, it is not clear whether the turn-yielding cues Duncan identified are important in distinguishing turn-final (completed utterances at the end of a turn) and non turn-final (or turn-medial) locations. However, it is important to try and build on the information Duncan provides and to examine the use of the turn-taking cues he identified at locations of potential or actual turn exchange (Wiemann, 1985). In other words, we should look at the use of turn-yielding cues that occur at locations that are particularly pertinent to the interactants from a turn-taking perspective. Since in the proper operation of the turn system listeners do wait until a speaker's utterance is semantically complete and/or syntactically complete, it is clearly important to investigate how a speaker communicates their intention to continue or not beyond such completion points. This question shall be investigated in chapter 4.

b)   It has been argued that the use of the term 'signal' in Duncan's model of turn-taking is misleading on two accounts. We will deal with each of these in turn.

Firstly, it has been suggested that the use of the term is not justified given Duncan's analysis It has already been noted that Duncan's method involved examining the behavioural regularities associated with locations within a turn and those associated with the end of a speaking turn.   This analysis therefore allows Duncan to make conclusions about the clustering of particular behaviours.   However, it does not permit inferences about the intentionality with which these behaviours were displayed (Roth, 1981; Cutler and Pearson, 1985; Clark, 1983 also emphasizes the importance of making this distinction).   For example, Duncan proposed that whilst gestural activity served to maintain a speaking turn, its cessation served to mark the end of a turn.   Butterworth and Beattie (1978) have found, however, that gestural activity

co-varies with speech planning. Thus it could be the case that gesticulation plays a role in the turn-taking process because participants recognise it as a *sign* that a speaker is, for instance, planning what to say next (Butterworth, 1980). Therefore it is more accurate to regard the use of such behaviours as informative (Roth, 1981) rather than purposeful (Clark, 1983)[8].

A second difficulty with Duncan's model, it has been suggested, is that conceptually the term 'signal' does not lead us to think about the behavioural regularities associated with turn-taking in an appropriate way (Wilson et al., 1984). It has been observed that the term 'signal' implies that the referent has a predetermined meaning or a set demand characteristic (Wilson et al., 1984). It has been argued that:

> 'This, however, seems to be unreasonable if in fact we are dealing with a system that people can actually use and manipulate. For, it is quite evident that the recognition of events in the course of social interaction by the participants in that interaction is heavily dependent on context. Thus, there is no more reason to suppose that turn-taking cues are recognisable independently of context than there is to believe that whether 'oh, yeah!' is an affirmative or a denial independent of context....This, then, directs attention to two major concepts. First, events in conversation are not fixed cues but rather resources for managing the interaction. And second, context plays a fundamental role in the selection of what events in an immediate situation will be mobilised as resources and how these resources will be employed as signals.'
> (Wilson et al., 1984, p173-174.)

In support of their case Wilson et al., note that not all instances of grammatical completion are treated equivalently; for, whilst some completions may mark the end of a turn others may be embedded in, for example, a story or complex question. Clearly from a turn-taking perspective the latter case of grammatical completion would have no implications for turn-taking as in actual conversation a speaker is usually given the opportunity to come to a logical completion (Wiemann, 1985). Thus Wilson et al., (1984) stress the importance of semantic context in providing participants with the relevant criteria for making judgements about whether a particular instance of grammatical completion represents the completion of a turn. And clearly when constructing a model of turn-taking it seems to makes sense not to treat grammatical completion as a fixed cue. (This is implicitly recognised in Duncan's model where grammatical completion is both a turn-yielding 'cue' and a within turn 'cue', a dual function which clearly casts serious doubt on Duncan's claim that all turn-yielding 'cues' are independent, Beattie, 1981a; Roth, 1981). But it is possible that the

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8. It should be noted that in the course of this thesis the term 'cue' will be used to refer to behaviours that may play a role in the turn-taking process. However, it should be emphasized that this term is used without any preconceptions or connotations of intentionality.

claim of Wilson et al., rests too heavily on the particular example of grammatical completion. There are no comparable *a priori* grounds to assume that other information in the speech stream does not function in a fixed way in conversation. And what evidence there is (albeit controversial) suggests that there are indeed specific contours of intonation mark the ends of speaking turns in conversation (Duncan, 1972; Beattie, 1981). However, it is possible that the significance of any such prosodic 'cues' could be modified or overriden by the verbal content of an utterance; for example, presumably a speaker who is in the middle of relating a story is free to use any intonation contour they may like. Significantly, on the whole psychological studies of turn-taking have tended not to entertain this possibility. For instance, some have assumed that as meaning completeness is so variable it is unlikely to be of any importance in turn-taking (Walker and Trimboli, 1984). In this dismissal we can clearly see that the concept that specific behaviours have a fixed function in turn-taking has influenced what factors have been assessed as possible contenders for turn-taking cues.

In short, it can be seen that the fixed-versus-flexible functioning of prosodic turn-taking cues is a crucial issue and one whose settlement will have fundamental implications for the theoreticial perspectives and research methodologies employed in this area of research. It is an issue that will be addressed in chapters 5 and 6. In addition, it has been seen that it is important to give consideration to the role of verbal content in turn-taking. This issue is considered in chapters 6 and 7.

c) An important conceptual limitation of Duncan's model stems from the type of 'cues' he identified. In particular, whilst he offered an account of how utterances are marked within a turn and at the end of a turn but he did not explain how a listener can anticipate the end of the turn (Walker and Trimboli, 1984; Slugoski, 1984; Beattie, 1985). Clearly, however, listeners do project the end of a turn since it has been found that in conversation a notable number of turn transitions involve pauses of less than 200 milliseconds (see for example Walker and Trimboli, 1984) and yet if a listener is going to take over the speaking turn within such latencies they need time to formulate what they are going to say before the speaker finishes talking. Turn-taking must therefore necessarily involve two stages - one which involves anticipating the end of a turn and the second which involves identifying the precise location where the switch should take place (Walker and Trimboli, 1984). So how do participants project the ends of speaking turns?

The model of turn-taking proposed by the Ethnomethodologists (Sacks et al., 1974) actually attempts to deal with this issue so we shall consider their specific proposal in the next section of this chapter (and again in chapter 7). However at this point we

shall just consider one account which was put forward by two Psychologists - Walker and Trimboli (1984; Walker, 1982). Briefly, they proposed participants use intonation and the rhythmic structure of language to project the ends of turns. Specifically, they suggest that whilst intonation provides information about how many syllables remain, the rhythmic structure of an utterance (that is relative stress and patterns of stress) provides information about the temporal duration of the remaining syllables. However, there are problems with this hypothesis. It is unclear how long an utterance would have to be to establish and detect a rhythm that would distinguish the difference between the projected length of, for example the utterance 'Why?' from an utterance where 'why' was also stressed but followed by 'did you do that?' Also it is not certain how individual differences in style or dialect could be accommodated into this theory. Furthermore, to an extent this hypothesis misses the point; for if a listener is going to begin to speak within a short latency to make a pertinent contribution to the conversation and the first speakers talk, then they must have an idea of how the speaker is going to complete their turn (Slugoski, 1984). Therefore, verbal content of talk must be, to some extent, predictable and projectable. In other words, it seems unlikely that rhythm and intonation provide the sole source of information about the projected length of a speaking turn. But what other sources of information are there? In chapter 7 the role of verbal content in this projection process will be considered.

d) Another conceptual problem with Duncan's model is the way he treated instances of simultaneous speech as a simultaneous claims for the turns (commonly called interruption). This definition is unlikely to yield an accurate picture of the true number of 'simultaneous' claims for the speaker turn for two reasons. Firstly, not all instances of simultaneous speech actually 'interrupt' the first speaker talk in the sense that this word is colloquially used. It has been observed that on some occasions the closing stages of persons talk will be spoken simultaneously with the next speaker but, importantly, the first speaker will reach a completion point (Jefferson, 1973, 1978; Ferguson, 1977). On such occasions the second speaker is said to 'overlap' the first speaker. Secondly, it has already been noted that sometimes a participant will 'seize' the turn whilst the first speaker is pausing (Ferguson, 1977). You will recall that Duncan listed a number of exceptions to the no-simultaneous speech rule. However, it is important to note that this stipulation is also likely to yield misleading results. Duncan stated that simultaneous speech resulting from filled pauses should not be treated as involving a simultaneous claim for the speaker turn. However, it has already been noted that filled pauses often occur after unfilled pauses and are used by a speaker to fend off possible interruptions. It thus seems likely that simultaneous talk arising from the first speakers' use of a filled pause is likely to be occurring at junctures where the first speaker is attempting to hold onto the speaker turn. It can

thus seems be seen that Duncan's conceptualisation of what actually is a simultaneous turn is inadequate.

e) The final problem concerns the status of Duncan's model and, in particular, how a researcher should treat results that do not accord with it. It has been noted that Duncan and Fiske (1977, 1985) are quite clear about this matter - discrepant results should be regarded as evidence that the participants were following different conventions. However, this means that it would not ever be possible to falsify or modify the model that they propose. How then do we deal with the fact that, for example, Beattie (1981) found in his corpus that turn-yielding cues were not linearly related to the probability of a listeners' turn-taking attempt but that clusters of cues were important (a model explicitly rejected by Duncan and Fiske, 1977, p200)? The line taken by this author is that because Duncan's model is not very robust any proposed modifications that bear directly on it's methodological and/or conceptual shortcomings should be incorporated. However, it is also important to note that Wilson et al., (1984) argued that if it is the case that the significance of turn-taking cues alters with the context of the conversation then the notion that turn-taking is regulated by conventions disintegrates. For it is difficult to see how fixed conventions could be developed or learned if they are to be renegotiated moment-by-moment according the context of the conversation. Thus if evidence is supplied for a flexible cue perspective then this would suggest that discrepant results should be treated as modifications to Duncan and Fiskes model of turn-taking.

In conclusion it can be seen that specific details of the turn system Duncan outlined has provided an important basis for further work in this area. In particular, whilst the model suffers from a number of methodological and conceptual limitations, these shortcomings have actually helped us to focus on particular issues that are central considerations for any model of turn-taking. Perhaps most importantly it has lead us to question which theoretical perspective should be adopted when to trying identify features that are important in turn-taking (the fixed-cues versus flexible-cues debate) and ask how do participants project the ends of speaking turns? These fundamental issues comprise important themes in this thesis.

Interestingly, Duncan's low-level perspective has been complemented by the model put forward by the Ethnomethodologists (Sacks, Schegloff and Jefferson, 1974), which has focussed on outlining the general principles involved in turn-taking, and argues that participants use their commonsense knowledge about the the role of language in turn-taking. Let us turn now to consider this model in some detail.

2.4. Sacks, Schegloff and Jeffersons Sociological model of turn-taking

In the first stage of the development of this model of turn-taking Sacks, Schegloff and Jefferson (1974, 1978) focussed on analysing and identifying features of the turn system per se that were 'grossly apparent' in a variety of different conversations and that were not a consequence of its operation in any particular situation. In this analysis great emphasis was placed on the precise placement of participants' talk. The general features that they identified included the following observations: for instance 1) the fact that overwhelmingly one party talks at a time 2) that speaker change recurs, or at least occurs 3) that turn order, its relative distribution amongst the participants and turn size varies (see Sacks et al, 1978, p10-11 for the complete list). These observations were treated as empirical constraints, which their model would have to address. These constraints were condensed into two main issues; specifically a) how participants identify a turn of talk and its completion point and b) how turns are allocated. From this analysis of the problem Sacks et al. proposed a turn-taking system that can be described in terms of two components and a set of rules. It should be noted that they did not present statistical data to support their analysis but they did present extracts of conversation that exemplified the features of organisation they described.

2.4.1. Component 1 - Turn-constructional component

Sacks et al., argued that speaking turns are constructed out of various *'unit types'*, which correspond to sentential, clausal, phrasal and lexical constructions. The crucial feature of these unit types is that in some instances the construction employed can be identified and used to project a possible completion point. Sacks et al., stipulated that *a speaker is only entitled to one unit type. Thus the first completion point of a unit type was regarded as constituting an initial 'transition-relevance place'* where the speaking turn may be re-allocated.

Sacks et al., claim that the importance of these unit type constructions in turn-taking can be seen by the fact that a next speaker begins (or attempts to begin) the next turn at locations that represent possible completion points and not continuously over the course of a turn. For example [9]:

a)	Penny:	An' the fact is I- is- I jus though it was so kind of stupid [I
	Janet:	[Y
	Penny:	didn' even say anything [when I came home
	Janet:	[Eh
	Janet:	Well Estelle jus' called'n...

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9. '[' indicates simultaneous speech

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b) Tourist:   Has the park changed much
   Parky:     Oh yes
   Old Man:   Th' Funfair changed it'n [ ahful lot [ didn't it
   Parky:                              [Th        [That
   Parky:     That changed it
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(taken from Sacks et al., 1978, p36-7.)

Specifically, they argue that such examples indicate that a participant's commonsense knowledge of language (i.e. unit types) plays a crucial role in anticipating a completion point. However, it is important to note that Sacks et al., also acknowledge that the syntactic description of unit types is only partial; they suggest that intonation and, more importantly, the content of a turn, may interact with the syntax of the unit to demarcate possible completion points. They observe, however, that such interactions have yet to be seriously investigated.

2.4.2. Component 2 - Turn-allocational component

According to Sacks et al., the speaker turn may be re-allocated at a transition relevance place by either the current speaker selecting the next speaker or by a listener self-selecting. They outline a number of techniques from each of these two groupings and some of these shall be briefly described below.

They suggest that perhaps the most obvious way a speaker can select a next speaker is by addressing a question to a specific listener (e.g. 'Bill you want some?' Sacks et al., 1974, p51). They suggest that a question serves as the *'first pair part'* of a sequential unit termed *'adjacency pair'*. This first pair part constrains what can be done in the next turn, that is in the case of a question it makes the production of an answer or *'second pair part' 'conditionally relevant'* (Schegloff and Sacks, 1973; Schegloff, 1972, 1977; Nofsinger, 1975). Failure to supply the second pair part is noticeable and treated as *'officially absent'* (Schegloff, 1972). The properties of an adjacency pair can be summarised as follows:

1) It involves two component utterances,

2) these component utterances are adjacently placed, that is the second part is 'expectable' given the production of the first,

3) different speakers produce each utterance,

4) there is relative ordering of parts (i.e. the first pair part precedes the second),

5) and discrimination of relations (i.e. the form and content of the second pair part depends on the type of adjacency pair of which the first is a member).

(see Schegloff, 1977, p84-5.)

This local organisation has been termed *'sequential implicativeness'* (Jefferson, 1978). It is important to stress that in order for a first pair parts to operate effectively and select the next speaker it must be addressed to a particular participant. This need not be done explicitly by using their name (as in the example above) but can be achieved by using direction of gaze or by implication. For instance, in the following example B can not answer A until further information is supplied but given the fact that A has asked a question in the preceding turn, B's reply can be seen to be directed solely at A. (A question-question sequence has been described as 'arching', Mishler, 1975.)

> A: Are you coming tonight?
>   {B: Can I bring a guest?
>   {A: Sure.
> B: I'll be there

(taken from Schegloff, 1972, p72.)

The placement of an additional question-answer pair between two adjacency pairs has been termed an *'insertion sequence'* (Schegloff, 1972). Affiliation to a first pair part is a useful device to allocate turns as there are whole range of adjacency pairs, other than question-answer sequences, that can be used. For example:

1) Complaint/denial

> Ken: Hey yuh took my chair by the way an' I don't think that was very nice.
> Al: I didn' take yer chair, it's my chair.

2) Compliment/rejection

> A: I'm glad I have you for a friend.
> B: That's because you don't have any others.

3) Challenge/rejection

> A: It's not break time yet.
> B: I finished my box, so shut up.

(taken from Sacks et al., 1978, p28.)

Other examples include 'greeting-greeting', 'invitation-acceptance/decline' and 'request-grant' sequences.

The basic technique for self-selection is to start before any other self-selector. This is because, according to Sacks et al., one rule in conversation is that the turn is allocated to that participant who speaks first (a second starter will only gain the turn if their talk reveals that they want to address problems concerning the understanding of the prior utterance). One consequence of this 'first starter' rule is that a participant who

wants to speak next is under pressure to self-select at the earliest/next transition relevance place. This can result in a systemmatic periods of simultaneous speech. For instance a) there may be variation in the articulation of the projected last component of the first speakers turn or b) two participants may self-select at precisely the same moment:

a) A: Well it wasn't me[e
    B: [No but you know who it was.

b) Mike: I know who d' guy is.
    Vic: [He's bad
    James: [You know the guy?

(taken Sacks et al., 1978, p16-17.)

Such examples clearly show that participants are not just capable of projecting a completion point but that they can predict these points with precision (Jefferson, 1973). An important feature of this model is that whilst simultaneous speech in the middle of a turn (that is away from a possible completion point) is regarded as an interruption, at the end of a turn it is regarded product of the smooth operation of the turn system. This stands in sharp contrast with Duncan's (1972) framework where all instances of simultaneous were regarded as breakdowns.

2.4.3. The rules

The allocation of turns using either current speaker selects or self-selection techniques is governed by an ordered set of rules, which are as follows. If a current speaker has selected the next speaker then this participant has the right and is obliged to take the next turn (rule a). However, if the current speaker does not select a next speaker before the transition relevance place then a participant is permitted to self-select at the transition relevance place (rule b; and of course generally the first starter acquires the rights to the next turn.) If at a transition relevance place the options specified by rule *a* or *b* have not been employed then the current speaker may or may not continue (rule c).

The hierarchical arrangement of these rules is crucial because it means that lower priority rules constrain the use of higher priority rules. For example, for rule *a* to be used effectively it must be invoked before the first transition relevance place and for rule *b* to be employed effectively it must be invoked at the transition relevance place and before the speakers exercises the option to continue talking. Thus it can be seen that these constraints ensure that these two turn-allocation techniques are compatible with allocating the turn to one party at a time. In addition, the fact that turn transfer is only permitted at transition relevance places means that the possibilty of gap or

simultaneous speech is localised to transition relevance places, thereby 'cleansing' the rest of the turn space of the systemmatic basis for their occurrence.

Sacks et al. (1978, p39-40) describe a number of repair mechanisms that deal with errors or violations of the turn system. Perhaps the most important device described is for the repair of instances where more than one participant self-selects at a transition relevance place. As noted above, this generally involves the second starter stopping their talk before they have reached the completion of their first unit type.

In conclusion, Sacks et al., observe that their model of turn-taking embodies two important features - that is it is both locally and interactionally managed. The system is locally managed in that the turn size and turn order are determined by the options chosen at each single transition relevance place as it occurs. It is interactionally managed because both the speaker and listener play a role in determining the boundaries of a speaking turn; a speaker talks in such a way as to allow projection of possible completion points and thus allowing others to use these locations to either start to talk or pass up the option of talking, but by starting to talk a participant can determine where the first speaker should stop talking. The recipients can use this turn system in a manner that displays sensitivity to the other co-participant(s), for example, by which particular transition relevance place they choose to exercise the option to start a turn. The system is thus said to be 'context sensitive'. Concomitantly, since the elements of the system embody general principles of conversation, which can account for turn-taking in a variety of conversations (for example ones that differ in the number of participants involved), it is also claimed that the model is 'context free'.

Importantly, however, this model suffers from a number of shortcomings.

2.4.4. Conceptual problems associated with the Sacks, Schegloff and Jefferson model of turn-taking

The problems with this model essentially stem from the fact that some of the underlying concepts are inadequately defined and as a consequence, it has been observed, that the reader is left to use their intuition to fill in the gaps that bind the system together (Beattie, 1983).

To date a good deal of the criticism has centered around the fact that the concept of unit type is not clearly defined (Beattie, 1983; Wilson et al., 1984; McLaughlin, 1984). For instance, Sacks et al., did not state what factors distinguished units that could be used to project a possible completion point, from those units that could not be used in

this way; for example, is it the case that some units lack the projectability feature because they involve constructions that a listener has particular difficulty in identifying? In addition, for those units that can be used projectively, Sacks et al., did not explicate how a listener identifies what particular type of unit is being used to construct a turn. Specifically, although they emphasize the importance of syntactic information in predicting a completion point they do not outline how syntactic structures actually indicate the impending completion of a particular unit (McLaughlin, 1984). Sacks (1972a) has acknowledged that the explanation of how participants identify the unit under construction (and thereby its size) is very complicated and not well understood. Using the case of the construction of a sentence, he summarised the difficulty as follows:

> '...for the construction of sentences, essentially one can only characterise productionally, sentence possibilities. That is to say, anything that is a possible sentence is also possibly extendable beyond, say, its first possible ending. For example, you can, having produced a possible sentence, put an "and" in or an "or" in, and make what was a possible sentence now the first clause of a larger sentence. And there are a range of ways of making sentences longer than their construction up to a first possible completion. That being the case, possible next speakers have, as something they can use, only a notion of "possible sentences" which they can apply to anything produced. And they cannot use a notion of a sentence definitively ending in order to see when they could start speaking "safely"; i.e. without interrupting somebody. On the other hand, they want to start speaking as soon as possible so as not to have a gap.'

(taken from Sacks, 1972, p15.)

However, Sacks argued that this notion of possible constructions can be used effectively when the turn comprises of the first pair part of an adjacency pair. This is because when speakers use these constructions they follow a special rule which states that when a first pair part is produced the speaker should stop talking at the first completion point (see also Schegloff and Sacks, 1973). Thus, as soon as a participant recognises the construction of, for example a question, they can begin to analyse the utterance to see what it would take to complete it, knowing that the speaker will stop speaking at the first of these locations (Sacks, 1972). Whilst the term utterance, as used in specific reference to the concept of adjacency pair, is never defined (Edmondson, 1981) this claim does seem to suggest that, for example, a first pair part of a complaint/denial sequence that involves a detailed accusation which takes several units to explain is not an adjacency pair. Yet the length of the utterance does not actually affect the relation inhering between the two parts. In other words, there seems no systematic basis for restricting the length of first pair parts. However, clearly without this restriction the effectiveness of adjacency pairs in

identifying the unit under construction and thereby smoothly allocating the turn, would be impaired.

Another problem that is related to the difficulty in identifying a unit type, is how a listener actually identifies a completion of a unit type that is not intended to mark the completion of a turn. As Beattie (1983) observes transition relevance places or possible completion points occur with a high frequency in the course of a turn and a participant may self-select at one of these loci when the speaker wished and intended to continue beyond this point. He suggested that a speaker may communicate the appropriateness of an exchange at a particular location by either using (or not using) the turn-yielding cues Duncan (1972) identified (Beattie, 1983). Of course, whilst in theory it is possible that such locations may be distinguished by the use of certain verbal or nonverbal features, it should be emphasized that the specific details of this proposal are by no means certain. As yet we do not know whether the behaviours Duncan identified are important in marking turn ends and, more generally, whether it is even appropriate to think of features in conversation as having a fixed function in relation to turn-taking. It can be seen therefore that truely we lack a systemmatic understanding of how extended turns are constructed and recognised (Wilson et al., (1984). It has been suggested that this partly because there is a prevailing assumption that verbal devices that facilitate extended turns are limited to obvious constructions, such as jokes and stories (Wiemann, 1985). For example, Schegloff (1980) has demonstrated how the use of certain prefacing statements can be used to suspend transition relevance place during the telling of a story. However, the problem with these observations is that they were fragmented and did not address the problem of transition relevance places systemmatically (Wilson et al., 1984). Clearly the question of how the supra-structure of a turn is constructed is an important research issue. It will be addressed in chapter 7.

Criticism of the turn-allocational component has centered around the techniques used by the current speaker to select next speaker. It has been noted that the onus is on adjacency pairs to be effective in allocating the turn (Ellis and Beattie, 1986). However, it has been found that in certain situations, namely group tutorials, a notable proportion of questions asked by a tutor were never answered and that when this happened a tutor would often resume speaking after a pause (Ellis and Beattie, 1986). For example:

a) Tutor: Yeah um, I mean suppose the interpretation of the cries is inaccurate and how how does one know that the interpretations are accurate? (1.5 second pause). I mean we assume that crying means...

b) Tutor: ...Umm what sort of account of language development would you give then? How would you orient it? (2.4 second pause) I mean what sort of issues...

(taken from Ellis and Beattie, 1986, p180.)

It has been suggested that the failure of this technique in conversation is partly attributable to the fact that the Sacks et al., system does not take account of the influence a listener can have on this nomination process; for example, a listener can use eye gaze to solicit, or actively avoid, being selected for the next turn (McLaughlin, 1984).

Another problem with the Sacks et al., model is that it does not provide adequate criteria for determining which rule is being followed in any one particular exchange (Edmondson, 1981). This point can be illustrated with the following example:

S1: hey you took my chair by the way
S2: I didn't take your chair
S1: You did you know
S2: it's my chair

(taken from Edmondson, 1981, p40.)

Edmondson argues that it is not possible to tell whether S2 gains their first turn by affiliation to a complaint-denial adjacency pair (rule a) or by self-selection (rule b). Similarly when S1 regains the turn it is not clear whether this is achieved through affiliation to another adjacency pair (Edmondson suggests we may wish to regard assertion-counter assertion as an adjacency pair) or by self selection or, since S2's next turn seems to be a continuation of the first, perhaps S1 grabbed the turn illegally. The basic point that Edmondson makes is that the rules that Sacks et al., propose are quite difficult to use on empirical data. This difficulty stems from the fact that the concept of adjacency-pairs is ill-defined. In particular, there are no specific criteria to use to determine if adjacently place utterances comprise a pair (Edmondson, 1981). The problem centres around the fact that although two utterances can vary continuously in their degree of relevance (Vuchinich, 1977; Tracy, 1982, 1984) generally it seems participants co-operate with one another and produce utterances that are relevant (Grice, 1975; this has been called the 'relevancy maxim'). In other words, how should an analyst decide whether the 'relatedness' (Schegloff and Sacks, 1973) between two utterance goes beyond that normally found between two adjacently place utterances? When looking at empirical data it is not always possible to decide if two adjacently placed utterances constitute an adjacency pair since there are no explicit criteria by which to judge whether there is the requisite degree of relevancy. Hence it is not possible to decide whether certain turns were allocated via affiliation to a first pair part or via self-selection.

In other words, it can be seen that the Sacks et al., model of turn-taking lacks definitional rigour. Therefore it is not possible to strictly test this model on empirical data. However, their analysis of the the turn-taking process has raised a fundamental issue. Sacks et al., have demonstrated that participants can and do project the ends of turns in conversation and this has emphasized the importance of trying to investigate how turns are constructed.

In summary, it can be seen that both Duncan and Sacks, Schegloff and Sacks, have provided some insights into the turn-taking mechanism, and, perhaps more importantly, this work has helped identify fundamental issues whose settlement would be central to any account of turn-taking. Specifically, there is the question of whether prosodic information has a fixed or flexible regulatory function, what is the role of verbal content, and how verbal content can play a role in marking and projecting the ends of turns in conversation? In the course of this review it has been indicated that it is these issues that the research in this thesis has set out to address.

In this review so far the emphasis has been on how interactants accomplish the smooth exchange of speaker listener roles. Brief reference has been made to interruption and how various researchers have defined this phenomena but it has been indicated that often these definitions have been inadequate. In the next section we will consider in some detail what is an interruption in conversation. Such considerations clearly from a fundamental basis for any study of the turn-taking process.

2.5. Interruption in conversation

Interruption in conversation has typically been regarded by researchers as a violation of the turn system (see for example Duncan, 1975; Wiemann and Knapp, 1975). As a consequence it has been argued that without a coherent theory of turn-taking it is not possible to deal adequately with this phenomena (Wilson et al., 1984), and for example, explain why they occur (i.e. their relationship to such factors as personality traits, social status and so forth) and what they represent. It is for this reason that in this research a definition of interruption will be employed that relies on noting the placement of the participants talk in relation to each other (often termed the 'structural approach'), rather than a judgement based on how the interactants perceive the event. However, it is important to note that some have argued that it is impossible to use rigid criteria to identify interruptions in conversation because it is crucial to ascertain what the participants-sense'[10] of an interruption actually involves (see for example

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10. This is a term coined by Edelsky (1981) to refer to the participants view of an event in a conversation.

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Bennett, 1978; O'Murray, 1985). Let us briefly consider the substance of their claim. It has been noted that interruption is an interpretive category that participants in actual conversation make use of to deal with the prevailing rights and obligations with respect to the speaking turn (Bennett, 1978). It thus tends to 'constrain' interruptions to being viewed as instances where the participants are in conflict with one another (Bennett, 1978). However, it has been argued that, in fact, participants have a much more flexible interpretation of such instances basically because there are no absolute rights to complete a turn (Bennett, 1978; O'Murray, 1985). In other words, there are no set criteria by which to identify an interruption in conversation. For instance, they are not tied to the occurrence of simultaneous speech but can occur when a speaker is pausing or when the proper order of speakers is not adhered to and a person answers a question that was addressed to someone else (O'Murray, 1985) Factors such as perceived apportionment of speaking time, special claims to be heard (such as if person's viewpoint has been attacked or queried by another), or how the interrupted talk contributes to the 'thematic' development of the first speaker can affect participants perception of an 'interruption'. For example, if a person has been dominating the conversation and talking for a comparatively long time the other participants involved in the conversation may regard an interruption as justifiable (O'Murray, 1985). Conversely, if two people are arguing and a participant takes a turn to explain the foundation or reason for their belief and thereby directly challenge the others stance, any 'interruption' that occurs before the first speaker has laid this 'groundwork' (i.e. at a crucial stage in the development of an argument) will be regarded as a rude and a violation of the first speakers right to complete their talk (Bennett, 1978). These researchers substantiate their claims by few extracts of conversation. However, as the concept of 'theme' was not precisely explained, although a reader may readily 'see' the point being illustrated in the examples, it is not possible to know exactly what one is agreeing with. Another problem with this approach is that it requires the analyst to continually make inferences about how the participants perceive an intrusion (McLaughlin, 1984). Whilst the accuracy of such inferences can be checked by asking the participants to review the audio or video recording and explain what they though was going on (c.f. the methodology employed by Tannen, 1984) it remains the case that perhaps such comments can only be put in true perspective when we have an understanding of how conversation proceeds smoothly.

The structural approach, however, also has problems. Specifically, there is little agreement about what types of phenomena actually constitute an interruption and, in addition, what terminology should be used to describe the phenomena identified. Some researchers have defined interruption soley on the basis of simultaneous speech (Jaffe and Feldstein, 1970; Cook and Llajjee, 1972) and, whilst others have used

interruptions and simultaneous speech as two separate measures, the relationship between these two measures has not been explicated (see, for example, Farina, 1960; Hetherington, Stouwie and Ridberg, 1971). Mishler and Waxler (1968), however, were one of the first to give a detailed definition (with examples) of interruptive speech. They regarded simultaneous speech as an essential component for an interruption and sub-divided them into two groups: a) instances where the second speaker prevented the first speaker from completing their idea (or successful interruptions) and b) instances where second speaker did not stop the completion of the first speakers' idea. This category embraced three sub-categories - instances where the second speaker 1) simply interjected brief remarks, such as 'umm', 'yeah' and 'right', 2) was *un*successful in their attempt to take over the speaker turn or 3) initiated the next speaker turn just as the first speaker reached a possible completion point. For example:

i)   Mother: B[ut he] can fight his own battles when it comes to it.
     Father: [Yeah] (Example 1)
     Daughter: [Yeah]

ii) Son: He['s got] to have a little uh knack [towards it. (Example3)
     Mother: [Well I]   (Example 2)
     Father: [He's going to have the
                  a talent

(taken from Mishler and Waxler, 1968, p382)

Ferguson (1977) argued, however, that these three sub-categories are distinct and independent phenomena and therefore should have been classified separately (see also McLaughlin, 1984). She pointed out that typically simultaneous speech arising from brief remarks (see example 1) have not been regarded as claims for the speaker turn but as signals of, for example attention and interest, which ensure that the current speaker continues to hold the speaker turn. These remarks have been termed back channel responses (see for example, Ygnve, 1970). She also claimed that unsuccessful interruptions (or *'butting-in interruptions'* as Ferguson, 1977, calls them, see example 2) and overlapping speech (*'overlaps'*, see example 3) are distinct because whilst the former causes a break in 'verbal continuity' of the first speakers talk , the latter does not. Furthermore, Ferguson argued that, contrary to Mishler and Waxlers' (1968) assertion that simultaneous speech was a necessary component for an interruption, some do not involve simultaneous speech [11]. Ferguson termed these interruptions, *'silent interruptions'* . For example:

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11. Ferguson (1977) called Mishler and Waxlers successful interruption, *'simple interruptions'*.

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A: It wasn't in ours actually it was a bloke and umm

B: But anybody who's a bit
lazy I suppose is it that he used to picks on?

(taken from Ferguson, 1977, p297)

Ferguson, contrasted these four categories of *'non-fluencies'* [12] with *'perfect speaker-switches'* - that is utterances where there is no simultaneous speech and the first speakers utterance is semantically, syntactically and phonologically complete. Beattie (1981b) has proposed, however, that kinesic information should also be taken into account when judging completeness. For during his analysis of video recordings of group tutorials he noticed that one tutor ended his turn 'so you might imagine it would be' and substituted an iconic gesture for the last word 'down'. Beattie (1981b) classified this exchange as a *'smooth speaker-switch'*. An example of a smooth exchange is given below:

MT: ...I hope it will succeed. We can put the ball at people's feet. Some
        of them will kick it.
DT: What about the people below the top rate tax payers...

(taken from Beattie, 1983, p130.)

This modified version of Ferguson's classification scheme is given in Figure 2.1.

The silent interruption category has given rise to some debate. In particular, it has been argued that silent interruptions are ambiguously defined (Roger, 1984, although precisely where this ambiguity lies has not been specified) and, in addition, they occur too infrequently for meaningful analysis (Roger and Schumacher, 1983). It has also been stated that 'a definition of interruption that is not explicitly tied to simultaneous talk renders the task of the analyst virtually unmanageable' (McLaughlin, 1984, p125). However, it is important to note that whilst Ferguson's scheme has been used as the basis of a number of investigations, no problems in identifying silent interruptions have been reported (see for example, Beattie, 1981b where inter-observer agreement for using the scheme was in the region of 90%; also Roth, 1981; Beattie, Cutler and Pearson, 1982). In addition, although silent interruptions do occur relatively infrequently they can, nevertheless, have a significant affect on the results of an investigation. For instance, Trimboli and Walker (1984) carried out a study which investigated the effects of three variables (conversation type, turn completeness and sexual composition) on the duration of switching pauses but because of the restricted way they operationalised interruptions (i.e. as simultaneous speech

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12. Ferguson coined the term non-fluency to minimize any connotations of defectiveness, which might occur with, for example the use of the prefix 'dys-'. It is for this reason that this term shall also be used in the course of this thesis.

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Figure 2.1: Classification of smooth speaker-switches and non-fluencies

Figure 2.1: Classification of smooth speaker-switches and non-fluencies
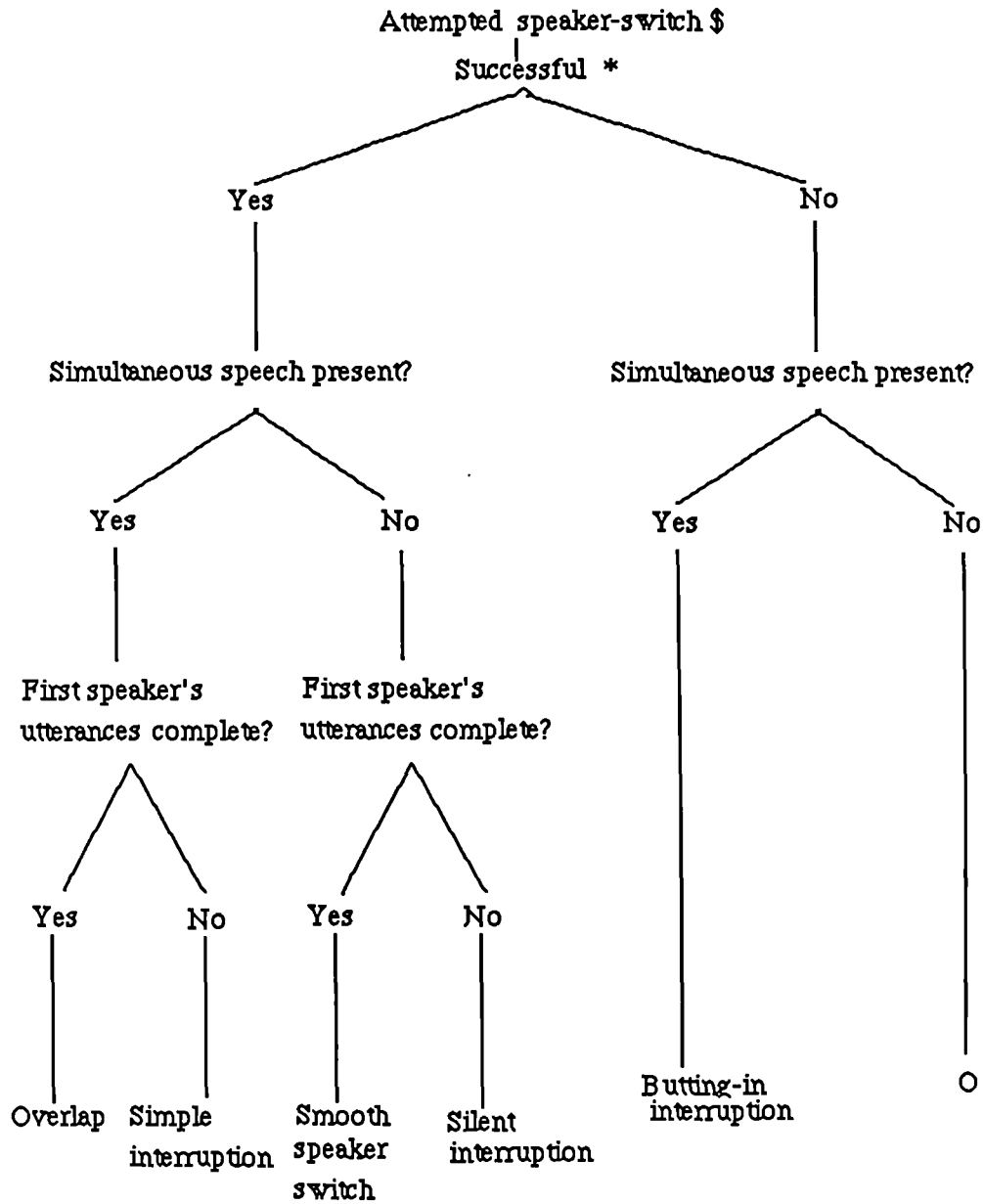
$ Back channels such as 'all right', 'yeah' and 'umm' were not treated as attempts to take the speaker turn

*'Successful' means that the second speaker takes over the turn

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produced by a participant begining to talk before the first speaker had finished the current turn - excluding back channels) the study produced, what was to them, anomalous results. They had hypothesized that the mean switching pause would be less following a complete turn than following an incomplete turn, but found that in conversations involving disagreement (which were described as competitive discussions), as opposed to those involving agreement (co-operative discussions), switching pauses were sometimes shorter than following incomplete turns. From this they concluded that shorter latencies after an incomplete turn must have been accounted for by interruptions - silent interruptions. This result can be seen as providing support for Ferguson's contention that silent interruptions are a valid behavioural category.

In summary, it has been seen that researchers have classified interruptions and simultaneous speech in a number of different ways. However, it has been argued that simultaneous speech is not a prerequisite for an interruption, and that silent interruptions are readily distinguishable and are also important components in the analysis of turn exchanges in conversation. It is for these reasons that Ferguson's scheme, with Beattie's (1981b) modification, will be used as a basis for classifying turn exchanges in this research.

Before we leave the topic of interruptions it is perhaps worth noting that although it has been argued above that a full appreciation of why interruptions occur in conversation relies on having a model of how smooth exchanges occur, some researchers have already attempted to address this question. Most of these investigators have however operationalised interruption purely on the basis of simultaneous speech (excluding back channel responses).

Generally interruption and simultaneous speech have been regarded as measures of dominance (see for example Farina, 1960; Mishler and Waxler, 1968; Hetherington, Stouwie and Ridberg, 1971; Jacob, 1974, 1975) and as a means of exercising control (Zimmerman and West, 1975; West and Zimmerman, 1977; Henley, 1975; Spender, 1982; Molotch and Boden, 1985). However, it has also been found that in some situations, namely group discussions in university seminars, interruptions can serve a confirming function (Kennedy and Camden, 1983). In one investigation of dyadic interaction, it was been found that the more confident a person feels about speaking the more frequently they interrupt (Natale et al., 1979). Similarly, in a sample of group discussions each involving three males, it has been found that the more extrovert, the neurotic and least intelligent individuals interrupted most frequently (Rim, 1977, although it should be noted that in this study the term interruption was not defined Beattie, 1983). Others have found that the use of interruptions can simply indicate

heightened involvement (Gallois and Markel, 1975). Also there is evidence that the outcome of an interruption (i.e. who actually 'wins' the speaking turn when there is simultaneous talk) is partly determined by the amplitude of the first speaker's voice (Meltzer, Morris, and Hayes, 1971). It should be emphasized that amplitude is not related to the content of what is said, since when amplitude of a speaker's voice is artifically and randomly varied during simultaneous talk the outcome can be accurately predicted simply on the basis of amplitude alone (Morris, 1971). It can be seen that these studies have produced a series of diverse and sometimes conflicting results. Yet it is difficult to synthesize these findings as we do not have a firm understanding of how the turn-taking system normally operates.

In this section the importance of having an adequate conception of what it means to interrupt has been stressed. At the sametime an explanation has been offered as to why the Ferguson (1977) scheme was chosen to classify the turn exchanges in the corpora of conversations that form the basis of this research. In the next chapter the results of using this scheme will be reported.

Chapter 3

The Organisation of Natural Conversation

3.1. Introduction

In this chapter data will be presented that will form the basis from which more substantive investigations into the turn-taking mechanism will follow. The aim of this chapter therefore is to explain why certain types of conversations were chosen for study and to give a 'feel' for the structural nature of these conversations.

The primary consideration guiding the choice of conversations involved the question of the generality of the turn-taking mechanism. It has been acknowledged that in order to gain a firm understanding of how turn-taking is managed generally, it is necessary to sample a wide variety of conversations since it is possible that this process may differ fundamentally across different types of conversations (Wilson et al., 1984; McLaughlin, 1984). For example, the relative frequency of non-fluencies may vary according to the number of participants involved or according to whether the participants are friends or strangers. In particular, it may be the case that as the number of potential 'next' speakers increases, to ensure the next turn, there may be a greater tendency for participants to claim the turn whilst the first speaker is finishing their talk. Similarly, it may be the case that friends may feel more relaxed about using non-fluencies as they are secure in the knowledge that, given history of their friendship, they will not be regarded as rude. It should be emphasized that although it is not possible to make direct comparisons between very different types of conversations in which the aims and motivations of the participants may vary considerably (e.g. a casual chat versus a telephone call to an emergency service), it is clearly a crucial empirical issue to identify any differences which may bear on the management of turn-taking. Sampling a broad cross section of conversations can also yield another benefit. For, in each type of conversation there is a considerable range of phenomena and noticing something particular about these can initiate a search through other data for similar occurrences (Heritage and Atkinson, 1984). Jefferson (1986) explained that it was in this way that she realised that bringing together different items (or colligating) in a two or three-part list format can be used to minimize repair or disagreement. More specifically, it could be the case that in conversations which are structured, with clearly identifiable goals (such as directory enquiry calls), it may be possible to identify regularities in the way the exchange of speaker turns are mediated that are not as apparent in unstructured conversations. Importantly, this focus could lead to the identification of comparable and significant

features which without this perspective may have gone unnoticed.

The investigations carried out during the course of this research are based on face-to-face conversations between groups of close friends, directory enquiry calls and telephone enquiries to a provincial railway station. In the next section the rationale will be given for the particular type and composition of the face-to-face conversation chosen for study. A similar exposition for the telephone calls chosen will follow in later sections.

3.2. The face-to-face conversations

In this research the face-to-face conversations chosen for study involved groups of close friends talking. They were asked to select and discuss topics on which they were in broad agreement and topics on which they were in general disagreement. In the case of disagreement they were specifically advised to choose topics that they knew were contentious and had caused arguments in the past. This particular set-up was chosen with the aim of rigorously testing the generality of the significance of the turn-taking cues Duncan (1972, 1973) identified. In the past little work has been done in this area. The significance of the Duncan's turn-taking cues has only been tested on dyadic conversations (see, for example, Duncan and Fiskes', 1977, replication studies for a complete test and Beattie, 1983, work on tutorials for a partial test that examined the instance of turn-yielding cues at smooth speaker-switches). It is therefore an empirical matter as to whether they are also important in either conversations involving more than two participants or conversations involving agreement and disagreement. On the first account there is some preliminary evidence which shows that some group conversations proceed very differently from dyadic ones. For example, Beattie (1981b) found that in group tutorials there were approximately 20% more non-fluencies in turn exchanges (excluding silent interruptions) than in dyadic tutorials. Beattie suggested that in group conversations it makes sense to interrupt to get the speaker turn because there are a number of listeners who could potentially take the next speaker turn. However, no one has investigated whether the number of participants involved in the conversation is reflected in any fundamental differences in the way utterance endings are marked, although clearly this is a matter of the upmost importance.

There is also the related issue of whether the turn-taking cues Duncan identified are used across different sorts of conversations. For example, earlier research has suggested that agreement and disagreement are characterised by very different interactional structures with disagreement involving a higher proportion of

interruptions[1] (Roger, 1984; Trimboli and Walker, 1984). However, in both of the aforementioned studies the subjects were unacquainted and it is questionable whether really heated disagreement ever occurred. There is evidence that people who had never met before go to great lengths to confirm what has been said even if they disagree (McLaughlin, Cody and Rosenstein, 1983). Pomerantz (1978) has also found that across a variety of situations the prefered response to an initial assessment of the situation is agreement and that in cases of disagreement participants organise their response to minimize the disagreement by, for example, a) prefacing the disagreement with agreement or b) delaying the disagreement by requesting clarification:

a) P: I wish you were gunnuh stay
    A: I do too. But I think Oh I've got suh damn much tuh do. I really
        I've gotta get home fer- hh   I may stay next week

b) A: You sound very far away?
    B: I do?
    A: Meahm.
    B: M- no I'm not

(taken from Pomerantz, 1978)

However, what is particularly important about Pomerantz's analysis is that she has demonstrated that preference for agreement is realised in specific sequences that are housed not only within a turn but spanning several turns. In other words, the content of what is said influences how it is said or the structure of the conversation. Thus it seems that it is not only likely that real disagreement would never develop between unacquainted subjects but that this eventuality would affect the structure of the interaction. Given this apparent interdependence of structure and content and, in addition, that one of the main aims of this research is to investigate the impact that different interactional structures has on the way turns are marked, it is clearly important to select subjects who are likely to engage in real argument, like those that can occur in families and between friends. In this present study groups of close friends were employed.

The groups were all composed of both females and males. This was because there is evidence that there are striking asymmetries in the way females and males manage conversations. Zimmerman and West (1975) found that in mixed dyadic conversations males contributed 96% of the total number interruptions (their definition corresponded to an implicit use of simple interruption). They concluded that the way

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1. In both these studies the definition of interruption employed corresponded to simple interruption.

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males used interruptions enabled them to dominate and control the conversation by preventing females from speaking.

Beattie (1982) has, however, argued that the figures are misleading. He noted that the data was selectively analysed and only parts which had notable periods of simultaneous speech and silences were examined in detail. No information was given about the length of these 'segments'. In addition, the measures of interruption were not standardized. Beattie (1982) pointed out that as a consequence Zimmerman and Wests' observations do not take into account the fact that the differences between male and female were in large part attributable to one male who contributed 11 of the 46 interruptions. Beattie calculated that the other ten men contributed an average of 3.5 interruptions each. He noted that such frequencies may not have been particularly noticeable if the segments of conversation from which they were taken were sufficiently long and that these frequencies would drop if there was another talkative male in the sample. However, despite these shortcomings the results of Zimmerman and West (1975) study have attracted alot of interest. Some investigations have replicated Zimmerman and Wests' original finding (McMillian, Clifton, McGarth and Gale, 1977; West, 1979; Natale, Entin and Jaffe, 1979; Eakins and Eakins, 1979) whilst others have not (Rogers and Jones, 1975; Beattie, 1981b; Roger and Schumacher, 1983).

It is difficult to reconcile these two 'sets' of results as not all these studies are directly comparable; they differ in the measures of interruption used, the number of subjects employed and the sexual composition of the groups. For example, McMillian et al.'s (1977) defined interruption as one subjects preventing another from completing their sentence and made no mention of whether this involved simultaneous speech. On the other hand, Rogers and Jones (1975) and Natale et al., (1979) defined interruption as the occurrence of simultaneous speech, excluding back channel responses, and distinguished those interruptions that resulted in a speaker switch. (The composite measure of interruption therefore included simple interruptions, overlaps and butting-in interruptions and successful interruptions, simple interruptions and overlaps.) The other remaining studies used measures of interruption that corresponded closely to Ferguson's (1977) simple interruption. From these studies interestingly it appears that as Haas (1979) suggested, sex of the participants is not the only variable that influences turn-taking patterns. However, again these investigations are not directly comparable - two looked at dyadic interactions and two at group interactions. In the case of the dyadic studies it is not known if the differences in turn-taking observed stemmed from the composition of the groups and or the task they were set; West (1979) studied mixed sex interactions, where the participants were asked to get to know each other and Roger and Schumacher (1983) studied same sex interactions, where participants were

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discussing a topical issue on which they disagreed. (It should be noted that Kimble, Yoshikawa and Zehr, 1981, found that both factors were important in mitigating the assertiveness or dominance of both males and females.) In the case of the group studies it seems that situational variables are at least as important as the sex variable. Eakins and Eakins (1979) investigated turn-taking patterns in faculty meetings and found interruptions were asymmetrically distributed according to sex and faculty rank. Yet Beattie (1981b), who looked at tutorial groups, found no significant sex differences in the frequencies with which female and male students either used interruptions or were interrupted. Of course it could be the case that in this particular study sex differences in turn-taking behaviour were masked by the fact that both female and male students were under equal pressure to contribute to the tutorial in order make a good impression on the tutor. However, from the series of investigations reported here it can be seen that the importance of sex differences in conversation is still unresolved. There is however, preliminary evidence which suggests that in some group interactions, situational factors, such as the need to make a good impression, may suppress or override any sex differences (see Beattie, 1981b). In this research mixed groups were chosen so that the relative impact of these two factors on the structure of conversation could be assessed.

In summary, it can be seen that the number and sex of the participants and the type of conversations were chosen because of the evidence that these factors affect the way conversations proceed. The purpose of this present study was to examine the effect each of these factors on turn-taking patterns. This will provide the basis to investigate specifically whether the type of conversation has an impact on the way utterance endings are marked, for example, by means of prosodic elements.

It should be noted that investigating agreement and disagreement presents a methodological problem. Trimboli and Walker (1984) in their study randomised the order in which unacquainted subjects were asked to talk about topics on which they agreed and topics on which they disagreed. In total each dyad conducted four 'separate' conversations, two involving agreement (A) and two involving disagreement (D) and each lasting five minutes. For half of the subjects the order to the conversations was ADAD and for the other half it was DADA. However, it is questionable not only whether unacquainted subjects would actually disagree but whether really heated disagreement would ever develop under circumstances where the interactants knew they are going to have to suddenly switch the tone of the conversation. (Roger's (1984) subjects only discussed topics on which they disagreed.) In a pilot investigation carried out by the experimenter it was found that subjects found it very difficult to suddenly change from vehement disagreement to agreement simply on the basis of the experimenter's request. The problem from the experiment's point of view is that this

natural order involves confounding the two conditions with order and time. However, it could be argued that the alternative approach of having independent groups of subjects taking part in these two conditions would present even greater problems given the evidence that participants can and do adjust aspects of their behaviour to 'match' their interactants. For example, it has been found that individuals alter the temporal characteristics (such as talk/silence sequences) of their talk as they converse with different participants. This 'matching' of behaviour has been called *'interspeaker influence'* (see for example, Jaffe and Feldstein, 1970; Cappella and Planalp, 1981; Cappella, 1981, 1984). Clearly, however, such influences within each group could act to blurr the differences between conditions of agreement and disagreement. It was for this reason that a repeated measures design was employed and since the subjects were very good friends, who were very familiar with each others speech style, it should be emphasized that confounding time and order is unlikely to have any serious effect. (The possibility of the order of the agreement and disagreement conditions affecting the results is is also explored in more detail in chapter 5).

In this next section data will be presented on the type of turn exchanges that occurred in agreement and disagreement. This analyses will of course take into account the influence that sex of the interactants could have on the management of speaker turns in these two conditions.

3.2.1. Method

Subjects and design. Ten groups of four undergraduates were employed. Each group comprised of two females and two males all of whom had known each other for over a year. The experiment used repeated measures design; all groups spoke first in conditions of agreement and then disagreement.

Procedure. Subjects were asked to select some topics, which they normally discussed. These were to include topics on which all of the interactants agreed (agreement condition) and also topics on which there was considerable disagreement within the group (disagreement condition). The groups were invited to hold the discussions in the Psychology Department's observation room, which is equipped with a one-way mirror, and were simply told that the experiment was concerned with group discussions. The experimenter settled the subjects into the room. They were then asked to talk for ten minutes on the topic they all agreed on after which the experimenter re-entered the room and asked them to begin the disagreement.

The interactants were filmed by a wall-mounted camera and a camera situated behind a

one-way mirror, using the split-screen technique. This particular method of recording has been shown to allow high reliability in the observation of nonverbal behaviour, specifically eye-gaze (see Beattie and Bogle, 1982). A microphone was fixed to one wall so that all utterances could be clearly recorded.

Detailed transcripts were made of 100 minutes of the conversations (5 minutes from each condition) and all the turn exchanges were classified using the modified version of Ferguson's (1977) scheme (recall figure 2.1.). However, it was observed that there were occasions when more than one listener began speaking at exactly the same time. This supplementary category was called multiple starts and the frequency with which they occurred was noted. Inter-observer reliability between two judges in applying this scheme was 87%. However, a more accurate measure of reliability is Cohen's Kappa, which takes into account chance agreement between the two judges (Cohen, 1960; also see Leach, 1979). For this reliability check Kappa was 0.85. The test re-test reliability was 96%. Reliability was calculated on the basis of a sample of 60 speaker-switches, 10 from each category.

Examples of smooth speaker-switches and the different types of non-fluencies are given below. These examples have been chosen with the aim of illustrating the range of phenomena included in each category.

Examples

1. *Smooth speaker-switch*
In example B it should be noted that there is no perceptible pause between the first and second speaker, the second speaker actually 'latches' (Schenkein, 1978; Tannen, 1984) onto the preceding turn.

Example A

Sue: ....and err they were saying that the rise of the Green party over there umm could lead to West Germany becoming a neutral country
Charles: It might be the best thing if we could just get a completely neutral Europe...
(3:03.58.67)

Example B

Linda: You see I'd quite like to live with somebody but I couldn't because of what my parents would think
Ian: Yeah that would happen to me as well...
(6:03.54.45)

Example C

    Lynn: ...if they o out chuck Cruise out at the same time which is you
                  know a different thing would you agree with it then?
    Brenda: But I I don't
                  know 'cause its watering its still watering down like freeze is the
                  first step....
(1:11.04.00)

2. Overlaps

From the examples below it can be seen that that there is quite a large variation in the amount of simultaneous speech involved in an overlap; it can involve just part of a word (see example A) or extend across more than one phrase (see example C) but in all cases the first speaker reaches a completion point.

Example A

    Mark: Yeah I know but after nine months you get attached to the little
                  little bas [tard]
    Tim: [Tha]t's just the point I mean you don't.
(5:01.20.56)

Example B

    Linda: ...we're not particularly religious haven't gone to church or
                  anything. It's just the way your [parents feel.]
    Maureen: [That seems] strange 'cause I'm
                  a Catholic and you'd think I'd feel more guilty...
(6:02.54.60)

Example C

    Sharon: ...I'm talking about the long term effects [on the brain.   I mean
    Tony: [Now the only yeah
    Sharon: [you can't get round it it does happen.]
    Tony: [but there is wh what what are you go]ing to do if you ban....
(4:12.18.34)

3. Simple interruptions

As with overlaps the amount of simultaneous talk resulting from a simple interruption varied. It should also be noted that in example B the interruption comes very soon after the first speaker has taken over the turn.

Example A

    Anna: ...something like 90 percent of experiments done you don't need
                  to do them. I mean there was one e[xperiment]
    John: [It depends] what you mean
                  by need to I suppose
(2:18.08.78)

Example B

Max: Y yeah OK [it's a]
Colin: [Right] so I mean that argument just doesn't hold.
(9:17.02.90)

Example C

Mark: Yeah it's just that their ultimate sort of aim [in the end is totally
Tim: [Ultimate aim is is
Mark: [different but]
Tim: [bad obvious]ly it's not what I would agree with at all but if they
            started blowing-up....
(5:15.14.45)

4. *Silent interruptions*

It is important to note that preceding the interruption the first speakers voice did
not decrease in amplitude. In addition, often the second speakers talk latched
immediately onto the first.

Example A

Anna: ...and shampoos and things like that to see if its going to
Rachel: Surely
            if you felt that strongly against it you wouldn't...
(2:17.29.40)

Example B

Sue: I'm obliged I just feel that that this country's position
Charles: OK they've
            had a raw deal historically but err
Sue: I know they've had a raw raw
            deal hist- raw deal historically but that's half the reason why I
            agree in principle with what the IRA...
(3:19.16.56)

5. *Butting-in interruptions*

Example A

Maureen: Yeah but I me[an I just] just because they have feelings it's it's
Ian: [I still I f]
Maureen: your right...
(6:04.03.98)

Example B

Jill: ...what's the difference between aborting it at say six weeks or
            eight weeks [and abortin]g it at thirty weeks because it's still alive
Max: [Because it.]
Jill: right?
(9:13.12.22)

Example C

Simon: ...if they break the law they should be done if the police br[eak
Karen: [Even
Simon: the law they should be done.] Yes if the law stinks then you
Karen: if even if the law is stupid Si.]
Simon: change the law...
(10:13.28.19)

6. Multiple Starts

From the examples below it can be seen that some multiple starts occurred after the first speaker had reached a completion point, others involved simultaneous speech.

Example A

Brenda: ...freeze isn't relevant t' today t- t- to the British situation anymore simply cause we've [got Cruise.]
Graham: [And also t}here w]
Lynn: [No but not} on the] lines that you get rid of Cruise as well as part of it....
(1:02.56.78)

Example B

Bob: ...parents haven't invested the same amount of money and they haven't expected the same [return.]
Ian: [No wh} no that doesn't work]
Kath: [Not all} parents invest who m]oney put pressure on you necessarily...
(7:16.58.96)

Example C

Babs: ...you're classing classing young people as to what their parents [are and you're not]
Owen: [Right even when y}ou're fully]
Sally: [Yeah and that's go}ing to perp]etuate class differences.
(8:02.08.56)

Analyses of the data

In some cases the data for comparing the relative frequency of the various turn exchanges was analysed using a Wilcoxon matched-pairs signed-ranks test. However, since the total number of turn exchanges was found to vary from group to group taking the proportion of a particular exchange from each group as forming one sample is not strictly justifiable; although it should be emphasised that doing so is unlikely to seriously effect the significance levels and indeed such analyses has been used as the basis of other similar investigations (see, for example Beattie, 1981b). Thus, erring on the side of caution, where possible the data was analysed using a

formula, which was specifically devised by Professor Robert Loynes and Dave Robson at Sheffield University's department of Probability and Statistics to overcome these problems (henceforth referred to as the L-R test, see note 1 for details: This formula was implemented using a Fortran 77 computer programme written by the author, see appendix I). Of course the same problem does not apply to butting-in interruptions since the analyses does not involve relating their frequency to the total number of turn exchanges in each group.

It is important to note that simply taking the absolute frequency of butting-in interruption presents a problem when looking at overall sex differences as each group was comprised of two females and two males. If we take as an example the situation of one female in a group it can be seen that if she initated a butting-in interruption she would have the opportunity to interrupt two males but only one female. Clearly in this case examining the absolute frequencies of female initiated butting-in interruptions according to the sex of the first speaker would give distorted results. In order that all the figures be directly comparable for statistical analyses the frequencies for the butting-in interruptions were doubled for those that were initiated by females when females were talking (female-female) and, similarly, for those that were initiated by males when males were talking (male-male).

The analyses for multiple starts was based on absolute frequencies and these were not included in any of the summary tables. This is because these exchanges involve different combinations of the sex of the first and second speaker and, in addition, they can involve either 2 or 3 'next' speakers (in other words there 8 possible combinations, excluding consideration of which 'next' speaker finally secures the speaker turn).

3.2.2. Results

Table 3.1 shows the relative frequency of smooth speaker-switches, overlaps and interruptions (simple and silent combined) for the ten groups. It can be seen that there is considerable variation between groups in the total number of speaker switches and in the relative frequency of each type of exchange. The percentage of speaker switches that were smoothly executed ranged between 40.0% and 66.3%, with a mean of 56% and whilst the range for those involving overlaps and interruptions was also large (from between 12% to 40%), the mean frequency was much lower (viz. 20%). When the relative frequency of each type of exchange was compared, it was found that there were significantly more smooth speaker-switches than either overlaps or

Table 3.1 : Relative frequency of smooth speaker-switches, overlaps and interruptions in face-to-face conversations

Group	All speaker switches	Smooth switches	Overlaps	Percentage Overlaps	Interruptions	Percentage Interruptions
1	50	30	11	22.0	9	18.0
2	83	49	16	19.3	18	21.7
3	65	43	8	12.3	14	21.5
4	67	32	23	34.3	12	17.9
5	83	55	13	15.7	15	18.1
6	101	58	24	23.8	19	18.8
7	91	53	16	17.6	22	24.2
8	45	18	12	26.7	15	33.3
9	67	42	12	17.9	13	19.4
10	107	46	43	40.2	18	16.8
TOTAL	759	426	178	Mean=23.0	155	Mean=21.0

interruptions (both Wilcoxons were significant at the 0.05 level[2]). There was no significant difference in the frequency with which overlaps and interruptions were used (Wilcoxon Test, T=27, n=10, n.s.). In total 60 multiple starts were observed.

Table 3.2 and table 3.3 show the relative frequency of each type of turn exchange in agreement and disagreement condition respectively. Again it can be seen that there is considerable variation in the number and type of exchanges that occurred. In the agreement 64.9% of all turn exchanges were smooth speaker-switches but in the disagreement condition this figure fell to an average of 46.0%. This difference was significant (L-R test=5.59, p<0.01). In disagreement, however, there were significantly more simple and silent interruptions (L-R test=-3.22 and -3.88, respectively, p<0.01) than in the agreement condition. There were no differences between the two conditions in the frequency with which overlaps (L-R test =-1.11, n.s.), butting-in interruptions or multiple starts were used (for butting-in interruptions see table 3.4. Wilcoxon Test, n=9, T=21, n.s.; there were 29 multiple starts in agreement and 31 in disagreement, Wilcoxon Test, n=9, T=17.5, n.s.) .

Figure 3.1 shows the relative frequencies of the four types of non-fluency in agreement and disagreement. In agreement it was found that overlaps and butting-in interruptions were the most common form of non-fluency and they both occurred significantly more frequently than either simple or silent interruptions (all the Wilcoxon Tests were significant at the 0.05 level). Simple interruptions occurred significantly more frequently than silent interruptions (Wilcoxon Test, T=1, n=10, p<0.01). In disagreement overlaps were not more common than any other non-fluency. Silent interruptions were, however, significantly less common than either butting-in interruptions and simple interruptions (both Wilcoxons were significant at the 0.05 level).

Interactions between agreement and disagreement and sex of the interactants.

Table 3.5 shows the relative frequency of each type of exchange when females take the speaker turn from males (male-female), males from females (female-male), females from females (female-female) and males from males (male-male). Table 3.6 shows the results of the statistical analyses of the various interactions between sex of the first and second speaker and the type of turn exchange. It can be seen that in some cases the sex of the interactant did have an effect on the use of smooth speaker-switches and simple and silent interruptions (but not on overlaps). For smooth speaker-switches it

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2. 2-tailed tests were used for all the statistical tests in this chapter.

Table 3.2:   Relative frequency of smooth speaker-switches, overlaps, simple interruptions and silent interruptions in the *agreement* condition.

Group	Smooth switches	Overlap	Percentage overlap	Simple interruption	Percentage simple interruption	Silent interruption	Percentage silent interruption
1	20	1	4.2	3	12.5	0	0
2	33	11	21.6	5	9.8	2	3.9
3	26	5	13.5	5	13.5	1	2.7
4	14	8	30.8	4	15.4	0	0
5	37	12	21.8	5	9.9	1	1.8
6	37	8	14.8	8	14.8	1	1.8
7	36	5	10.0	7	14.0	2	4.0
8	11	9	36.0	4	16.0	1	4.0
9	23	6	18.8	1	3.1	2	6.3
10	29	21	37.5	5	8.9	1	1.8
TOTAL	266	86	Mean=20.9	47	Mean=11.8	11	Mean=2.6

Table 3.3: Relative frequency of smooth speaker-switches, overlaps, simple interruptions and silent interruptions in the *disagreement* condition.

Group	Smooth switches	Overlap	Percentage overlap	Simple interruption	Percentage simple interruption	Silent interruption	Percentage silent interruption
1	10	10	38.4	4	15.4	2	7.7
2	16	5	15.6	6	18.8	5	15.6
3	17	3	10.7	3	10.7	5	17.9
4	18	15	36.6	6	14.6	2	4.9
5	18	1	3.6	5	17.9	4	14.3
6	21	16	34.0	.7	14.9	3	6.4
7	17	11	26.8	10	24.4	3	7.3
8	7	3	15.0	8	40.0	2	10.0
9	19	6	17.1	7	20.0	3	8.6
10	17	22	43.1	12	23.6	0	0
TOTAL	160	92	Mean=24.1	68	Mean=20.0	29	Mean=9.3

Table 3.4: Relative frequency of butting-in interruptions in agreement and disagreement

Group	Agreement	Disagreement	Total
1	2	5	7
2	10	4	14
3	4	6	10
4	14	18	32
5	6	5	11
6	8	9	17
7	14	12	26
8	7	7	14
9	9	10	19
10	12	10	22
TOTAL	86	106	192

Table 3.5: Overall frequency of smooth speaker-switches, interruptions and overlaps when females took the speaker turn from males (male-female), males took the speaker turn from females (female-male), females from females (female-female) and males from males (male-male) in face-to-face conversation.

Group	Male-female	Female-male	Female-female	Male-male
Smooth speaker-switch				
1	9	14	3	4
2	18	17	9	5
3	14	7	18	4
4	11	4	4	13
5	17	25	3	10
6	16	21	4	17
7	15	13	0	25
8	5	8	2	3
9	8	17	4	13
10	19	11	11	5
TOTAL	132	137	58	99
Total as % of all switches in each sex combination	57.1	57.1	52.3	55.9

Table 3.5 continued.

Group	Male-female	Female-male	Female-female	Male-male
Overlaps				
1	2	4	5	0
2	4	7	3	2
3	1	4	1	2
4	2	13	2	6
5	5	5	0	3
6	6	9	4	5
7	3	7	0	6
8	4	3	1	4
9	5	0	2	5
10	9	19	9	6
TOTAL	41	41	27	39
Total as % of switches in each sex combination	17.7	17.1	24.3	22.0
Simple and silent interruptions				
1	7	1	1	0
2	5	4	5	4
3	2	5	6	1
4	7	1	1	3
5	9	1	0	5
6	8	3	0	8
7	7	7	2	6
8	5	3	4	3
9	3	2	1	7
10	5	5	6	2
TOTAL	58	32	26	39
Total as % of all switches in each sex combination	25.1	13.3	23.4	22.0

Table 3.6: Statistical tests comparing type of turn exchange and sex of first and second speaker in face-to-face conversation

Sex of speaker First /second	Smooth speaker switches	Overlaps	Simple/silent interruptions	Butting-in interruptions
a) F-M M-F	LR test= 0.06 n.s.	LR test =1.77 n.s.	LR test =2.52 p<0.05	Wilcoxon T=20.5 n=9, n.s.
b) F-M M-M	LR test = 0.09 n.s.	LR test =1.62 n.s.	LR test =2.13 p<0.05	Wilcoxon T=22 n=9, n.s.
c) F-M F-F	LR test= 1.29 n.s.	LR test=0.54 n.s.	LR test=2.54 p<0.05	Wilcoxon T=13.5 n=9, n.s.
d) M-F F-F	LR test = 2.05 p<0.05	LR test =1.27 n.s.	LR test =0.28 n.s.	Wilcoxon T=27 n=10, n.s.
e) M-F M-M	LR test= 0.25 n.s.	LR test=1.16 n.s.	LR test=0.73 n.s.	Wilcoxon T=27 T=27 n=9, n.s.

Figure 3.1: Relative frequency of different categories of non-fluency in
a) agreement and b) disagreement
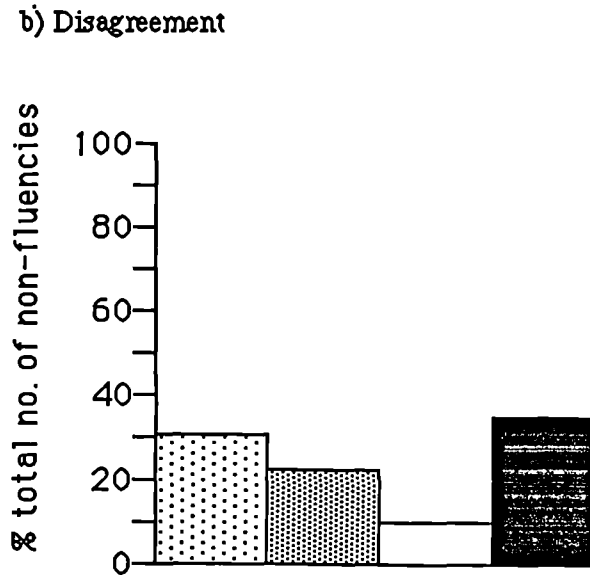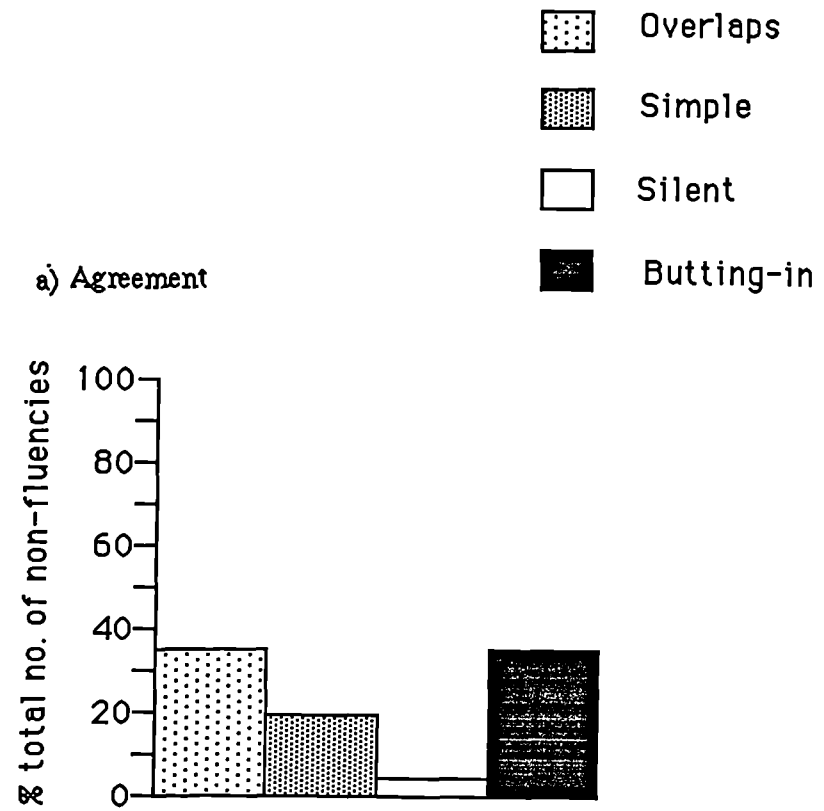
was found that they were used significantly more frequently when a female took the speaker turn from males than from females. Interestingly, for interruptions it was found that the significant sex differences in its use stem from the fact that males interrupt females relatively infrequently. Interruptions were implicated in 13% of all female-male turn exchanges compared with an average of 24% in male-female, female-female and male-male exchanges.

Table 3.7 shows the relative frequency of butting-in interruptions broken down according to the sex of the first speaker and the initiator of the interruption. From the table of results (see Table 3.6) it can be seen that there were no sex differences in the use of butting-in interruptions.

The next stage of the analysis was directed towards isolating the effects of agreement and disagreement from those due to sex differences and thereby determine the relative importance of these two factors in turn management. Figure 3.2 compares for each combination of the sex of the interactants, the proportion of each type of turn exchange in agreement and disagreement (expressed as a percentage of the total number of exchanges in that combination). It was found that for each particular combination of the sex of the interactants, the differences between agreement and disagreement were in accordance with the general trends observed. In other words, for each combination for the sex of the first and second speaker, in disagreement, there were less smooth speaker-switches and more simple and silent interruptions, than in agreement. Statistical analyses showed that these differences were significant at the 0.05 level with the exception of two results; there was no significant difference between agreement and disagreement when females took the speaker turn from females using a smooth speaker-switch and when males took the speaker turn from females using an interruption (for female-female smooth speaker-switches, L-R test=0.68, n.s. and for female-male interruptions, L-R test=-1.65, n.s.). Of course when the initial frequencies are low, as in the latter case particularly, further analyses which involves breaking down the category is less likely to result in statistical significance. The important point is that the trend goes in the same direction. There were no significant differences between the two conditions in the use of overlaps or butting-in interruptions.

3.2.3. Discussion

This study looked at the type of turn exchanges that occurred when groups of friends agreed and disagreed. As in Beattie's (1981b) study it was found that non-fluencies were implicated in approximately one third of all turn exchanges. This provides corroborative support for Beattie's observation that non-fluencies are more common

Table 3.7 : Overall frequency of butting-in interruptions initiated by female whilst male speaking (male-female), initiated by male whilst female speaking (female-male), initiated by female whilst female speaking (female-female), and initiated by male whilst male speaking (male-male) in face-to-face conversation.

Group	Male-female	Female-male	Female-female	Male-male
1	4	0	3	0
2	4	9	1	0
3	3	1	4	2
4	13	8	4	7
5	2	6	2	1
6	3	7	0	7
7	8	8	3	7
8	2	7	3	2
9	3	7	4	5
10	21	15	3	3
TOTAL	63	68	27	34
% of total	32.8	35.4	14.1	17.7

Figure 3.2: Relative frequency of each type of turn exchange in agreement and disagreement broken down according to the sex of the first and second speaker

a) Smooth speaker-switches
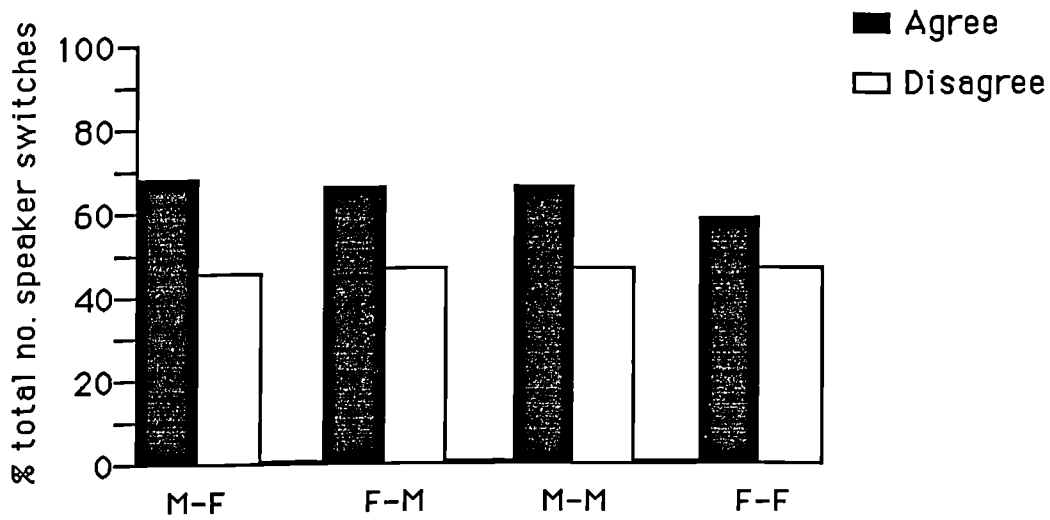
b) Overlaps
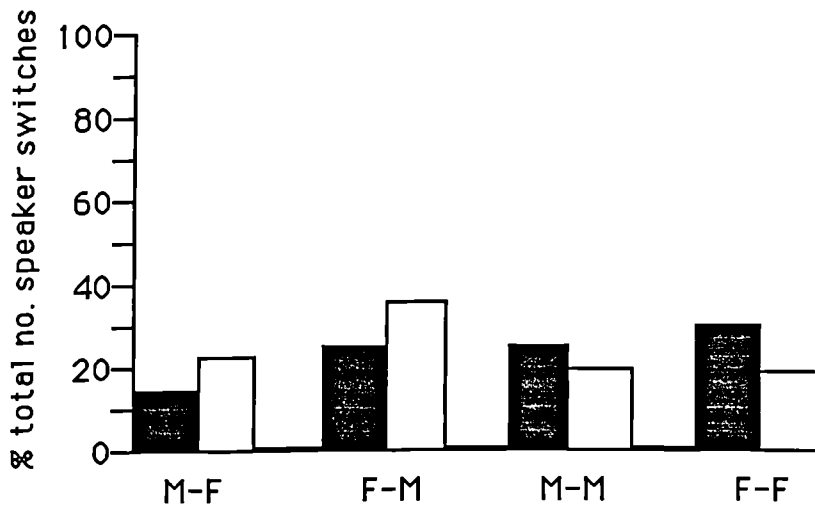
c) Simple and silent interruptions combined
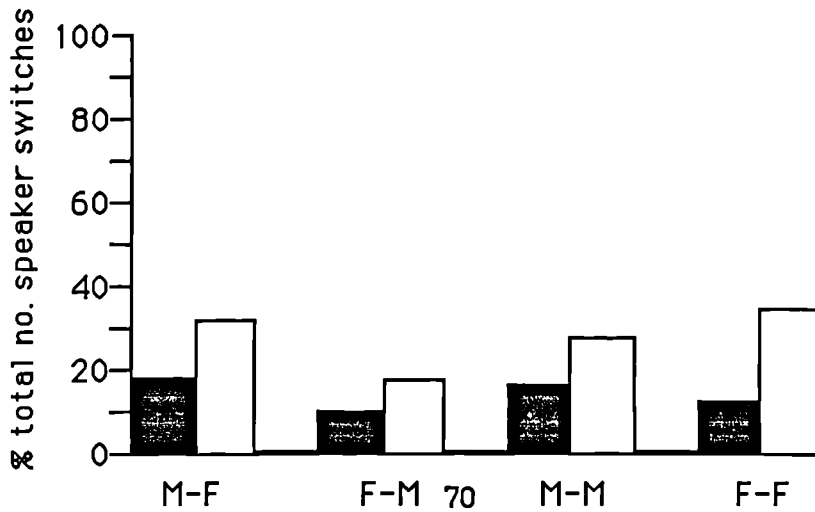
in group conversations than dyadic ones. In addition, as predicted (see Roger, 1984; Trimboli and Walker, 1984) it was found that there was a significant increase in the use of interruptions in disagreement. In this study this increase was accompanied by a significant decrease in smooth speaker-switches. The differences between these two conditions will provide a firm basis for investigating whether the type of conversation has a fundamental effect on the way speaker turns are marked.

It is worth noting that when the the relative frequency (or rank order) of non-fluencies in this study is compared with that observed by Beattie (1981b) some interesting differences emerge. Whilst in this study it was found that simple and butting-in interruptions each accounted for approximately 35% of the non-fluencies, Beattie (1981b) found that simple interruptions accounted for twice as many non-fluencies as butting-in interruptions (33% and 15%, respectively). In other words, what seems to be happening is that Beatties' interactants were more successful in securing the speaker turn via simple interruption than friends conversing in conditions of agreement and disagreement. One may speculate that perhaps in a tutorial the first speaker is more willing to relinquish the turn in response to interruption; for example, if a tutor is interrupted they may relinquish their turn as they want the students to make a contribution and students, who often find the tutorial situation anxiety provoking, may just be glad of the opportunity to stop speaking. In contrast, in conversations between friends the first speaker may be more eager to keep the speaker turn and finish their point.

This study also found that the sex differences in turn management mainly resulted from the fact that males interrupted females relatively infrequently! This particular result was rather surprising given that previous studies have found either the converse (that is that males interrupt females very frequently, see for example Zimmerman and West, 1975) or no sex differences at all (see for example Beattie, 1981b). Importantly, however, further analyses showed that the conditions of agreement and disagreement had a more general and important effect on the type of turn exchanges than sex of the interactants.

3.3. The telephone conversations

It is self-evident that telephone conversations differ from face-to-face conversations in that they transcend distance and only transmit audio information but what effect do these factors have on the way participants manage their conversations?

The extraordinary success of the telephone and its increasing importance as a means of

communication[3] suggests that conversation via this medium is not be adversely effected. There is, however, evidence that the content of telephone conversations may differ from face-to-face conversations. Schegloff (1977) pointed out that the openings of telephone conversations do have a sequence of exchanges not regularly found in face-to-face conversations. In these sequences the participants deal with the job of identifying and or recognizing one another verbally (in face-to-face conversations this is usually accomplished visually) since the identity participants is usually relevant to the conversation. He observed that this problem was usually dealt with in a standardized way in the callers first turn. (Godard, 1977, however, observed that in France the callers first turn is concerned with checking the number to see if the call has reached the correct place and that it is the callers second turn that deals with identification/recognition.) Winskowski (1977) observed that this opening sequence is typically followed by a reason for calling to justify the 'summons' (Schegloff, 1972) of the telephone bell, which some people can find intrusive and annoying (Humenick, 1983). Later in the call the re-introduction of the reason for calling can be used as an attempt to close the telephone conversation (Sacks, 1968; Albert and Kessler, 1978). The close can also be initiated in other ways, for example 'We-ell', 'So-o' and 'OK' said with a downward intonation can be regarded as 'possible pre-closing' statements (Schegloff and Sacks, 1973). Such statements indicate that the speaker has nothing further or new to say. The other participant can therefore either legitimately introduce a new topic or 'return' with another pre-closing statement, which serves to signal the onset of the closing section of the conversation. Schegloff and Sacks (1973) proposed that the closing section contains, at the very least, the exchange of good-byes. Clark and French (1981), however, found that in America not all the terminal exchanges in operator-controlled calls followed this pattern. They observed that the good-bye exchange was not always used in ordinary, straightforward, impersonal operator-controlled calls and that these calls terminated with the *'thank you - you're welcome'* exchange. They concluded that the good-bye exchange did not serve to terminate the conversation but to reaffirm acquaintance and thereby was optional in an routine operator-controlled call, where obviously the participants were unacquainted.

It has been suggested that the differences between 'telephone' conversations and face-to-face conversations are not just confined to opening and closing sequences but can include the content of the main part of the conversation. In particular, it has been

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3. For example, from the year 1983 to 1984 the total number of telephone calls made within the UK increased by 1283 million, from 21403 million to 22 686 million (Annual Abstract of Statistics, 122, E. Lawrence (ed), Central Statistical Office, London, HMSO).

found that when strangers disagree the content of audio-only[4] conversations tends to be more task oriented than face-to-face conversations   (Stephenson, Ayling and Rutter, 1976; Rutter, Stephenson and Dewy, 1981). Rutter, et al. (1981) proposed that the absence of visual information and/or physical presence (termed 'cuelessness') interacts with other factors, such as the purpose of the encounter and the relationship of the participants, to give the participants a feeling of greater 'psychological distance', which in turn may effect the way the conversation is conducted. Importantly, preliminary evidence was provided which suggested that orientation to the task may effect turn-taking patterns, with the interaction being characterised by less interruptions[5] (Rutter et al., (1981). In other words, there is the possibility that in telephone calls the content of the conversation may directly influence patterns of turn-taking. Although it is beyond the scope of this research to investigate this particular causal relationship, this possibility serves to emphasize the importance of looking at different types of telephone conversation in order to gain an understanding of how participants structure and mark their speaker turns on the telephone.

From the review in chapter 2 it is known that audio-only conversations usually proceed very smoothly (despite the fact that early investigations suggested visual information was crucial for synchronizing a smooth exchange of speaker turns). However, it was noted that out of this series of investigations Beattie and Barnards (1979) study was the most important since it was the only study to look at natural telephone conversations where the participants were motivated by practical considerations of both time and cost - they looked at directory enquiry calls. In this study it was found that approximately 93% of all speaker switches were smoothly executed and, that despite the operators comparably vast experience, there was no difference between operators and subscribers in the percentage of smooth speaker-switches. However, two things should be noted. Firstly, Beattie and Barnard only distinguished smooth speaker switches and simultaneous speech that resulted from simultaneous claims to the turn. It is therefore not known if the level of smooth speaker switches was inflated by the inclusion of silent interruptions and whether there were any operator and subscriber or indeed sex differences in the type of simultaneous talk that occurred. Secondly, Beattie and Barnard (1979) acknowledged that directory enquiry calls are highly structured and partially planned dialogues. It therefore could be the case that Beattie and Barnards results would not generalise to other in less structured operator-controlled calls. Travel enquiry calls are

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4. The term 'audio-only' is used to refer to 'telephone' conversations that were conducted in the laboratory.
5. Interruptions were not explicitly defined. They simply observed that most simultaneous speech arises from interruptions (Rutter et al., 1981, p47). It can be presumed that their operationalisation excludes back channels and silent interruptions.

one example of less structured operator-controlled calls. Although these calls have been found to pass through five main stages of information retrieval, which involve, for example, specification of the enquiry, delivery and acknowledgement of the information, (Waterworth and Talbot, 1985), these calls are less predictable than directory enquiry calls, inasmuch as the types of request made vary from, for instance, straightforward enquiries about the arrival of a particular train to enquiries where the caller wants to know the cost and time of a number of different routes. Importantly, in these calls it has been found that there are differences between subscribers and operators in the way they deal with the task at hand (Waterworth and Talbot, 1985). In particular, it was found that subscribers varied quite considerably in the phrasing and organisation of the initial stage of their enquiry, in some instances they failed to specify their enquiry, and instead went off at a tangent, for example giving lengthy explanations as to why they wanted to undertake the journey. In contrast, the operators had been trained how to provide information over the telephone and tended to provide it in a fairly uniform manner. However, from this observation it does not necessarily follow that there were no differences between operators; for instance, it could be the case that they differ in the way they attempt to keep the call on course. In other words, it is not known whether the relatively unpredictable nature of these calls and the differences in the way the call is handled as a function of the participants role is reflected in the patterns of turn-taking.

In summary it has been seen that there is evidence that the content of some 'telephone' conversations (both natural and laboratory-based ones) are different from face-to-face encounters. There is also evidence that the content of the conversation may effect the way participants manage their speaker turns. Furthermore, it has been found that some highly structured telephone calls proceed very smoothly but there is some preliminary evidence that this may not be the case for less structured calls.

In this research the corpora of telephone conversations chosen for study comprised of travel enquiries made to a provincial railway station and directory enquiry calls. One advantage of using calls to public services is that they are constrained in their objectives (e.g. to give travel information or locate a number) and as Barnard (1974) points out as a result they come as close as it is probably possible, outside a laboratory, to proving a corpus of calls which are comparable in both content and task structure. However, another advantage is that these particular calls differ in the degree to which they are structured - directory enquiry calls tend to be fairly straightforward dialogues whereas travel enquiry calls tend to be more variable. They therefore provide a suitable database on which to test the general importance of the turn-taking cues Duncan identified (1972, 1973) and in particular to investigate the way people

mark their speaker turns on the telephone. Little is known about turn management in natural telephone conversations.

As indicated in the general introduction to this thesis from a practical point of view the answers to the questions posed in the course of this research could have implications for the development of new telephone technology. Specifically, if a human could interact with a computer via speech then a computer could could be used for the efficient and remote access of information from a remote data base containing, for example travel information. However, to produce a system that could both speak and listen requires an understanding of the fine structure of speech communication at all levels, for example, from an understanding of the relationship between sound symbols and actual sounds to how signal analysis is carried out by the human ear (Levinson and Liberman, 1981). In particular, for optimal communication between a user and a system, it would be necessary to equip the system with the means to signal the end of its speaking turn. It is equally important that the system be able to interpret any such signals when 'listening' to a human speaker. The success of such an endeavour requires a firm understanding of how human speakers structure their speaker turns during telephone calls and, perhaps more importantly, how they mark their turn-final and turn-medial utterances.

In the next section data will be presented on the type of turn exchanges that occurred in a sample of directory enquiry calls.

3.4. Directory enquiry calls

3.4.1. Method

Procedure. This corpus of calls was compiled over a four month period by Barnard (1974). The corpus consists of seventeen, 60 minute sessions. These sessions were spread across the time of day and day of the week. In this period all the incoming calls to a single switchboard position were recorded onto an audio cassette tape with the knowledge of the operator concerned. All the operators were female. Most of the calls made were enquiries about the telephone numbers of business subscribers with enquiries about private subscribers number accounting for only 8-13% of the calls received. This is in line with the daily pattern of enquiries (Post Office National Directory Enquiry Analysis Record No. 731, August 1974). Most of these calls (84%) were successful in that the subscriber either obtained the information they had originally asked for or the operator had given a satisfactory substitute. For a more detailed description of the content of both successful and unsuccessful calls the

reader is referred to a study prepared by the author specifically for British Telecom and reported in Appendix II.

Transcripts were made of a representative sample of 6 calls from each of the 15 operators (session 16 was excluded as it involved the same operator as session 15). These calls ranged from 8 seconds in length, with a total of 4 turn exchanges (operator 9, subscriber 3) to 293 seconds, with a total of 49 turn exchanges (operator 12, subscriber 4). The overall mean length was 54 seconds, with a mean of 13 turn exchanges. As with the face-to-face conversations, all the turn exchanges were classified according to the modified version of Ferguson's (1977) scheme (recall figure 2.1). Inter-observer reliability between two judges in applying this scheme was 90%, Kappa=0.87 (Cohen, 1960; Leach, 1979). The test re-test reliability was 93%.

Reliability was calculated on the basis of a sample of 40 speaker-switches, 10 from each category[6].

Examples of smooth speaker-switches and the different types of non-fluency are given below. It should be noted that compared with the face-to-face conversations there is not the same range of phenomena in each category.

Examples

1. *Smooth speaker-switch*
In examples A and B there was no perceptible pause between the first and second speaker.

Example A

        Operator: ...yes thank you. Name of the people?
        Subscriber: Monks Wood
                 Experimental Station.
    (O6, sub 1)

Example B

        Operator: It's Cambridge 00000
        Subscriber: 00000
    (O8, sub 6)

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6. The categories of simple and silent interruptions have been combined in this reliability check and the subsequent analyses since silent interruptions occurred very infrequently, a total 3 times. In this chapter the term interruption is used to refer to simple and silent interruptions.

Example C

    Subscriber: Yes I think it's Fitzroy street
    Operator: Laurie McConnells?
(O5, sub 3)

2. *Overlaps*

From the examples below it be seen that, unlike the face-to-face conversations, the period of simultaneous speech ensuing from an overlap was always brief, lasting no longer than one word.

Example A

    Operator: And the name of the people ple [ase.]
    Subscriber: [St J]ohn's College please, the
               catering department.
(O2, sub 1)

Example B

    Subscriber: I see. Thank you. B[ye.]
    Operator: [Th]ank you
(O12, sub 6)

Example C

    Operator: Directory enquiries which [town?]
    Subscriber   [Oh yes]. I want to ring up
             Stiener's...
(O5, sub 2)

3. *Simple interruptions*

It also should be noted that the simultaneous speech ensuing from this type of interruption did not exceed one word.

Example A

    Subscriber: Yes HMV. It's a big re[cord]
    Operator: [His] Majesty's Voice isn't it?
(O14, sub 1)

Example B

    Operator: Well if [you]
    Subscriber: [So t]hat's it it's under Drayton Walter
(O9, sub 3)

Example C

    Subscriber: Can you give me the number of the Cambridge Building
             Society please [I]
    Operator: [T]he Cambridge Building Society.
(O4, sub 1)

4. *Silent interruptions*

The three silent interruptions that occurred in this corpus are given below.

Example A

> Subscriber: British Leyland. Well actually its Longbridge in Birmingham
> isn't it? Longbridge err
> Operator: Birmingham?

Later in the same call the subscriber 'silently' interrupts the operator.

> Operator: Well if it's Oxford sir it's not umm
> Subscriber: Or would that come under
> Cowley err Cowley exchange?
> (O3, sub 1)

Example B

> Subscriber: No CUS[7]
> Operator: I can't hear you sorry.
> (O15, sub 1)

It should be noted that in the example above the subscriber was attempting to spell the name of the people, who were called 'Custand'.

5. *Butting-in interruptions*

Example A

> Subscriber: Umm Arrington. [I dial] 444 do I?
> Operator: [You]
> (O4, sub 5)

Example B

> Operator: And is it just Bexley Roofin[g did] you say?
> Subscriber: [Yeah] Company limited.
> It's 49 Brer...
> (O9, sub 4)

Example C

> Subscriber: ...there isn't another one there? [We've been ringing] that one
> Operator: [Well there's nothing]
> Subscriber: and we don't get any answer
> (O14, sub4)

---

7. Capital letters are used to indicate that the word is being spelt out.

To compare the patterns of turn exchange between operator and subscribers, and female and male subscribers, the Wilcoxon matched-pairs signed-rank test was used. A separate test was carried out for smooth speaker-switches and each type of non-fluency. For each test, as there were a number of calls from each operator session, the first column of data comprised of the difference between the participants being compared in the mean percentage of that particular turn exchange in each session. (It should be noted, however, that as butting-in interruptions can not be expressed as a percentage of the total number of turn exchanges, the analysis for this non-fluency was based on absolute frequencies.) These differences were then compared with 0, the result that would have been obtained had there been no difference between the particular participants being compared. (It should be noted that as there were six calls from each operator session the L-R test could not be used for this analysis.) The Kruskal-Wallis test was used to examine whether there were any differences between operators and between subscribers in their pattern of turn-taking.

3.4.2. Results

Table 3.8 shows the percentage frequency of each type of turn exchange across the six calls in each of the 15 sessions. It can be seen that a mean of 92% of all turn exchanges were smoothly executed when operators took the speaker turn from subscribers and 88% when subscribers took the speaker turn from operators. This difference was not significant (Wilcoxon Test, T=34, n=15, n.s.). There was also no significant difference between operators and subscribers in the proportion of interruptions used (Wilcoxon Test, T=14, n=7, n.s.). There were, however, significant differences in the use of overlaps and butting-in interruptions (Wilcoxon Test, for overlaps T=20.5, n=15, p<0.05 and for butting-in interruptions T=8.5, n=11, p<0.05). It can be seen from Table 3.8 that, on average, subscribers used approximately twice as many overlaps as operators. Operators, on the other hand, used approximately twice as many butting-in interruptions as subscribers, although it should be noted that, overall, butting-in interruptions occurred relatively infrequently (a total of 38 times out of 90 calls, see Table 3.9).

The next stage of the analyses was directed towards investigating whether there were any differences between operators and between subscribers in the way they manage their speaker turn. However, it should be noted that as overall operators and subscribers used relatively few interruptions and butting-in interruptions the following analyses was only carried out on smooth speaker-switches and overlaps. For

Table 3.8: Relative frequency of each type of turn exchange in directory enquiry calls when subscribers take the speaker turn from operators (operator-subscriber) and operators from subscribers (subscriber-operator)

Session	Operator-subscriber				Subscriber-operator			
	All switches	Smooth speaker	Overlap	Interrup -ion	All switches	Smooth speaker	Overlap	Interrup -ion
1	64	81.3	15.6	3.1	62	98.4	1.6	0
2	34	88.2	11.8	0	32	100.0	0	0
3	39	89.7	7.7	2.6	38	89.4	5.3	5.3
4	40	90.0	10.0	0	39	84.6	10.3	5.1
5	44	81.8	18.2	0	41	90.2	9.8	0
6	38	86.8	13.2	0	35	91.4	8.6	0
7	41	90.2	9.8	0	39	84.6	15.4	0
8	26	84.6	15.4	0	25	88.0	12.0	0
9	72	86.1	11.1	2.8	64	92.8	7.2	0
10	38	94.7	5.3	0	36	91.7	5.5	2.8
11	42	85.7	14.3	0	37	94.6	2.7	2.7
12	32	71.9	28.1	0	32	87.5	9.4	3.1
13	32	93.8	6.2	0	29	100.0	0	0
14	34	91.2	5.9	2.9	34	91.2	2.9	5.9
15	54	98.1	1.9	0	55	87.3	3.6	9.1
Total/Mean	630	87.6	11.4	0.009	603	91.5	6.1	2.3

Table 3.9: Overall frequency of butting-in interruptions initiated by subscribers and operators in each session of directory enquiry calls

Session	Subscriber initiated	Operator initiated	Total
1	2	3	5
2	1	3	4
3	0	0	0
4	2	3	5
5	0	1	1
6	0	0	0
7	0	0	0
8	0	0	0
9	3	4	7
10	0	2	2
11	1	2	3
12	0	3	3
13	0	1	1
14	1	2	3
15	3	1	4
TOTAL	13	25	38
% of total	34.2	65.8	100

operators it was found that there was no significant difference in the relative frequency with which they used smooth speaker-switches (Kruskal-Wallis Test, H=22.78, df=14, n.s.). There was, however, a significant difference between operators in the frequency with which they used overlaps (Kruskal-Wallis Test, H=24.13, df=14, n.s.). Inspection of Table 3.8 shows clearly where these differences emerge, for example compare the relative frequency of overlaps used by the operator in session 2 with the one in session 7. When the relative frequency with which subscribers used smooth speaker-switches and overlaps was compared, it was found that there was no significant difference in their use (Kruskal-Wallis Test, H=22.07 and 22.31, respectively, df=14, n.s.).

As it has been found that turn management varies according to the participants role within the conversation and, in addition, since all the operators were female, the analysis of the effect of sex of the interactant on patterns of turn-taking was confined to subscribers. From Figure 3.3 it can be seen that when female subscribers took the speaker turn from the operator 82% of the exchanges involved smooth speaker-switches whereas for male subscribers the corresponding figure was 90%. This difference, however, was not significant (Wilcoxon Test, T=26, n=15, n.s.). Similarly, although female subscribers tended to use more overlaps than male subscribers when taking the speaker turn from the operator this difference was not significant (Wilcoxon Test, T=38, n=15, n.s.)

3.4.3. Discussion

The findings of this present study corroborate Beattie and Barnards (1979) - the majority of speaker switches were smoothly executed. The infrequency of silent interruptions in this corpus suggest that the level of smooth speaker-switches observed by Beattie and Barnard (1979) is unlikely to be seriously effected by the exclusion of this particular non-fluency from the analyses. This is not necessarily the case, however, for the composite measure of simultaneous speech that they used. In this present study it was found that there were differences between operators and subscribers in the type of simultaneous speech used; operators initiated more butting-in interruptions than subscribers but subscribers used more overlaps than operators. It may be the case that the use of butting-in interruptions may simply reflect an occasional ambiguity surrounding the marking of utterance endings within a turn. However, the differential use of overlaps may reflect something more fundamental about the nature of such structured calls; the specific content of the operators turn is very predictable as they follow a very strict format, for example first they ask the name of the town, then the name of the people and so forth. The subscriber therefore not only knows when to time their talk to overlap the end of the operators turn but by

Figure 3.3: Relative frequency of smooth speaker-switches and overlaps
when female subscribers and males subscribers take the speaker
turn from an operator during directory enquiry calls
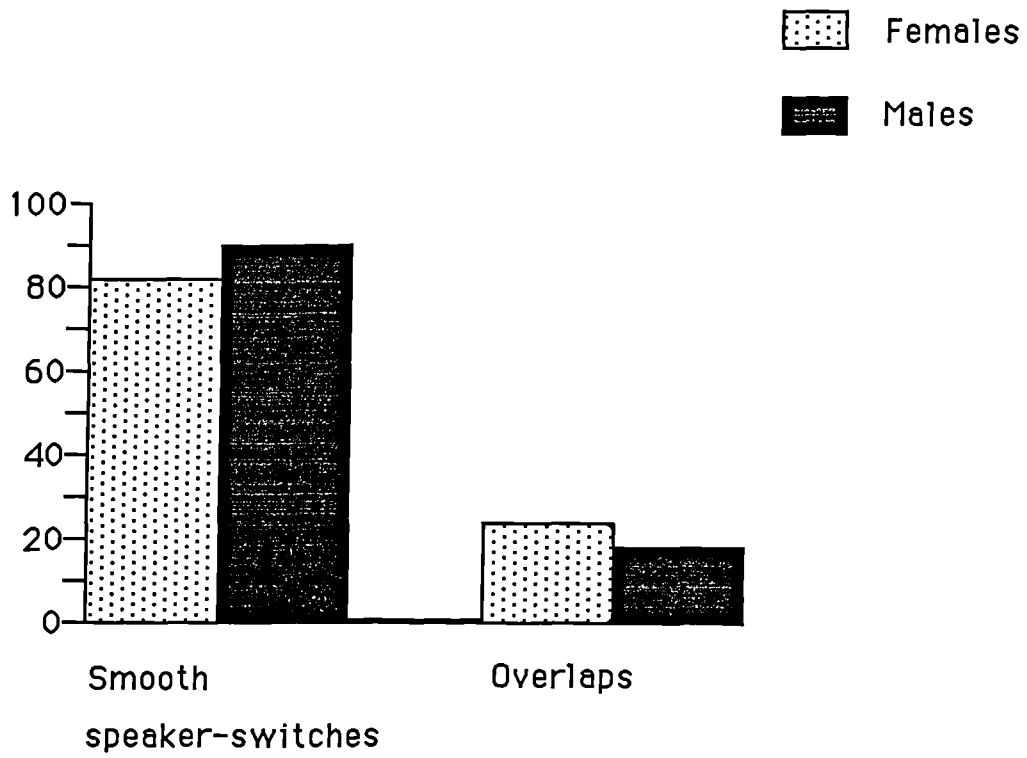
doing so could possibly aid the efficiency of the call. However, the operator, with the exception of the closing sequence, is less likely to overlap the end of a subscribers speaker turn just in case they miss any crucial information. In other words, the most striking difference between operators and subscribers is in the use of overlaps. This difference seems to stem from the variation between operators and subscribers in the degree to which their turns are predictable and structured.

In the next section data will be presented on the type of turn exchanges that occurred in a sample of travel enquiry calls.

3.5. Travel enquiry calls

3.5.1. Method

Procedure. This corpus of conversations used in this research was collected by Talbot. It consists of over 300 calls made to a provincial railway station during the course of eight working days in July 1985. In this period all the incoming calls to a single switchboard position were recorded onto an audio cassette tape recorder. As there was no strict rota for answering the calls there were at least six different operators. However, the majority of calls were answered by one of three male operators. All the operators knew that their conversations were being recorded and it was emphasized that this monitoring would not be used to judge their ability as an operator.

Transcripts were made of a representative sample of 12 calls from each of the three principal operators. It is perhaps worth noting that these calls were actually selected using a BASIC computer programme, which was written by the author to randomly select 12 numbers from a specified range. Thus all the calls of the three operators were numbered from 1 to n. The programme was then run three times. On each occasion the upper limit was set according to the total number of calls involving that particular operator (for a programme listing see appendix III). The calls thus selected ranged from 15 seconds in length, with a total of 3 turn exchanges (operator C, subscriber 5) to 146 seconds, with a total of 57 turn exchanges (operator C, subscriber 9). The overall mean length was 91 seconds, with a mean of 19 turn exchanges. All the turn exchanges were classified using the modified version of Ferguson (1977) scheme (recall figure 2.1). Inter-observer reliability between two judges in applying this scheme was 93%, Kappa=0.90 (Cohen, 1960; Leach, 1979). The test re-test reliability was 94%.

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Reliability was calculated on the basis of a sample of 72 speaker-switches, 24 from each operator, 6 from each category [8].

Examples of smooth speaker-switches and the different types of non-fluencies are given below.

Examples

1. *Smooth speaker-switches*

Example A

    Operator: Not a direct one. You will have to change.

    Subscriber: What time does it leave?

(OA, sub 5)

Example B

    Subscriber: Hello. Could you tell me the times of the trains to Ely on weekdays?

    Operator: Ely. What sort of time do you want to...

(OC, sub 7)

Example C

    Operator: ...and that gets into Melton Mowbray at ten fifty-one.

    Subscriber: Right umm coming back could you give me a weekday one and a Saturday...

(OB, sub 3)

2. *Overlaps*

Example A

    Operator: ...it's either St Pancras or Moor [gate.]

    Subscriber: [Yeah] can you give me the times from Moorgate ....

(OC, sub 6)

Example B

    Subscriber: ...I have got to be in the hotel by twe[lve]

    Operator: [We]ll that'll do I should think...

(OA, sub 1)

---

8. As in the directory enquiry enquiry calls, silent interruptions occurred infrequently (a total 3 times) and so the results were combined with those of simple interruptions.

Example C

    Operator: Oh return! What dates are you actua[lly travelling?]
    Subscriber: [Er it it was the]
    twenty-third.
                    It's mid-week anyway.
(OB, sub7)

4. *Simple interruptions*

Example A

    Operator: We do a saver ticket which [errr]
    Subscriber: [Wh]at 's that mean please?
(OA, sub 8)

Example B

    Subscriber: Yeah but how longs it take err it leaves at five forty-one so h-
                      [how long]
    Operator: [Yeah gets] on the hour into Colchester.
(OB, sub 10)

Example C

    Subscriber: ...I don't mind how late you kn[ow. I think the last on]e
    Operator: [I see. Well lets just] see
                when the last one would be then.
(OC, sub 11)

3. *Silent interruptions*

The three silent interruptions that occurred are given below.

Example A

    Subscriber: ...will the Waterloo and City Line be open at that time or will I
                 have to go across
    Operator: Should be.
(OC, sub 11)

Example B

    Subscriber: Umm
    Operator: Well there's one at one 'o' five and three 'o' five.
(OB, sub 11)

Example C

    Subscriber: ...times of the trains please from Felixstowe to Congleton in
                 Cheshire please
    Operator: Just a moment
(OB, sub 9)

In the example above the subscriber reaches a possible completion point but in terms of the intonation the utterance sounds incomplete. This seems to be

confirmed as after the operators comment, the subscriber immediately adds 'for tomorrow please'.

4. Butting-in interruptions

Example A

    Operator: There's one at nine forty-se[ven. It's t]hrough train to Ely...
    Subscriber: [Ohh that's]
(OC, sub 7)

Example B

    Subscriber: ...I'd like to get there probably about half I mean quarter to
                [nine. I'd like] to go from Wickham Market....
    Operator: [Yeap you got.]
(OB, sub 8)

Example C

    Operator: Well they leave between six o'clock and midnight.[They run]
    Subscriber: [Ahh I won]
    Operator: every fifteen minutes in between.
(OA, sub, 11)

Analyses of the data

As with the directory enquiry calls, a Wilcoxon test was used to compare operator and subscribers patterns of turn exchange. However, as there were only three operators in this corpus of calls the comparison was carried out separately for each operator session. For each Wilcoxon test the first column comprised of the difference between the operator and each of his subscribers in the percentage of that particular type of turn exchange. This difference was then compared with 0, the result that would have obtained had there been no difference. (As with the directory enquiry calls, the analysis of butting-in interruptions was based on absolute frequency.) The Kruskal-Wallis test was used to investigate whether there were any differences between operators and between subscribers in the proportion of smooth speaker-switches and non-fluencies used. To compare patterns of turn exchange according to the sex of the interactants as there were only three operators and unequal numbers of male and females in each session, a binomial test was used.

3.5.2. Results

The first stage of the analyses was directed towards investigating whether there were any differences between operators and subscribers in the types of turn exchange they used. Tables 3.10a, b and c show the relative frequency of each type of turn

Table 3.10: Relative frequency of each type of turn exchange in travel enquiry calls when subscriber take the speaker turn from the operator (operator-subscriber) and the operator from subscriber (subscriber-operator)

a) Operator A's session

Call Number	Operator-subscriber				Subscriber-operator			
	All switches	Smooth speaker	Overlap	Interrup -tion	All switches	Smooth speaker	Overlap	Interrup -tion
1	10	7	2	1	10	7	3	0
2	4	3	1	0	4	2	1	1
3	4	4	0	0	4	2	2	0
4	15	10	5	0	14	8	5	1
5	8	7	1	0	7	4	3	0
6	10	9	1	0	9	8	1	0
7	8	7	1	0	8	5	2	1
8	14	10	3	1	14	4	8	2
9	6	6	0	0	6	3	3	0
10	6	4	2	0	5	4	1	0
11	8	5	3	0	8	4	4	0
12	6	6	0	0	6	5	1	0
Total	99	78	19	2	95	56	34	5
% of total		78.8	19.2	2.0		58.9	35.8	5.3

Table 3.10 continued.

b) Operator B's session

Call Number	Operator-subscriber				Subscriber-operator			
	All switches	Smooth speaker	Overlap	Interrup -tion	All switches	Smooth speaker	Overlap	Interrup -tion
1	4	2	2	0	4	4	0	0
2	2	2	0	0	2	1	1	0
3	15	11	3	1	14	12	1	1
4	11	10	1	0	11	7	4	0
5	6	5	1	0	6	5	1	0
6	4	4	0	0	4	3	1	0
7	11	6	5	0	11	9	2	0
8	6	6	0	0	7	3	3	1
9	21	20	1	0	21	17	2	2
10	14	12	2	0	14	10	2	2
11	10	9	0	1	10	7	1	2
12	9	7	2	0	8	5	3	0
Total	113	94	17	2	112	83	21	8
% of total		83.2	15.0	1.8		74.1	18.8	7.1

Table 3.10 continued.

c) Operator C's session

Call Number	Operator-subscriber				Subscriber-operator			
	All switches	Smooth speaker	Overlap	Interrup -tion	All switches	Smooth speaker	Overlap	Interrup -tion
1	19	15	4	0	18	12	5	1
2	8	8	0	0	7	6	0	1
3	5	5	0	0	4	4	0	0
4	5	5	0	0	5	5	0	0
5	2	2	0	0	1	1	0	0
6	9	6	3	0	8	4	1	3
7	11	9	2	0	10	9	1	0
8	11	11	0	0	10	4	5	1
9	29	24	4	1	28	16	4	8
10	7	6	1	0	6	4	2	0
11	18	15	3	0	18	13	2	3
12	10	10	0	0	10	7	2	1
Total	134	116	17	1	125	85	22	18
% of total		86.6	12.7	0.8		68.0	17.6	14.4

exchange when subscribers took the speaker turn from operators (O-S) and when operators took the speaker turn from subscribers (S-O). It can be seen that all three operators tended to use less smooth speaker-switches than their respective subscribers. This difference was significant in the case of operators A and C (both Wilcoxon tests were significant at the 0.01 level) but not in the case of operator B (Wilcoxon Test, T=17.5, n=11, n.s.). When the use of overlaps by operators and subscribers was compared, it was found that operator A used significantly more than his subscribers (Wilcoxon Test, T=6, n=11, p<0.05). This was not the case for the other two operators (Wilcoxon Test, for operator B, T=18.5, n=10, n.s. and for operator C, T=13, n=8, n.s.). When the use of interruptions by operators and subscribers was compared, it was found that Operators C used significantly more than his subscribers (Wilcoxon Test, T=0, n=7, p<0.05). There was, however, no significant difference between operator A and his subscribers in their use (Wilcoxon Test, T=17.5, n=11, n.s.). In operator B's session interruptions were used so infrequently that they did not yield to statistical analysis. (Nevertheless, it is perhaps worth noting that operator B did tend to use more interruptions than his subscribers.) With respect to butting-in interruptions, it is important to note that generally they occurred relatively infrequently - a total of 12 times in operators B and C's session and 3 times in operator A's session. Statistical analysis showed that there was no significant difference between operators B and C and their subscribers in the frequency with which they initiated butting-in interruptions (Wilcoxon Test, for operator B T=7.5, n=5, n.s. and for operator C T=14, n=8, n.s.). In operator A's session butting-in interruptions occurred so infrequently they did yield to statistical analysis. In other words, it can be seen that whilst in one session the operator (B) did not differ from the subscribers in the way he managed his speaker turns, in the other two sessions there were differences. Furthermore, it was found that these differences between operators and subscribers were not consistent across the two sessions.

The next stage of the analyses was directed towards investigating whether there were any differences between operators and between subscribers in the way they manage their speaker turn and, like the directory enquiry calls, owing to the infrequency of interruptions and butting-in interruptions the analyses was only carried out on smooth speaker-switches and overlaps. It was found that there was no significant difference between operators in the frequency with which they used smooth speaker-switches (Kruskal-Wallis Test, H=3.90, df=2, n.s.) but there was a significant difference in the frequency with which they used overlaps (Kruskal-Wallis Test, H=8.25, df=2, p<0.05). From Table 3.10a, b and c it can be seen that 35% of operator A's turn exchanges involved overlap compared with approximately 18% for the other two operators. For subscribers, however, it was found that there was no significant

difference in the frequency with which they used either smooth speaker-switches or overlaps (Kruskal-Wallis Test, $H=1.91$ and $H=1.68$, respectively, df=2, n.s.). In addition, a Binomial test showed that within each session there was no significant difference in the frequency with which males and females used these particular turn exchanges (see Figure 3.4).

3.5.3. Discussion

The results of this present investigation have shown that in some travel enquiry calls there are differences between operators and subscribers in the way they manage the turn-taking process. More importantly, it has been shown that whether there are differences and the form these differences take varies between sessions and stems from the way individual operators manage their speaker turns and not subscribers. This variability between operators clearly suggests that individuals respond differently to the accumulated experience of managing such calls. It also raises the question of whether operators differ fundamentally in the way they mark their speaker turns. This particular issue will be addressed in succeeding chapters.

When these results are compared with those found for directory enquiry calls some interesting differences emerge. As predicted it was found in travel enquiry calls although the majority of speaker-switches were smoothly executed, there were more non-fluencies than in directory enquiry calls (see Table 3.8 and 3.10a, b and c). In both calls there were differences between operators and subscribers in turn management. However, in directory enquiry calls these differences could be accounted for in terms of the varying predictability in the structure of the operators and subscribers speaker turns whereas in the less structured travel enquiry calls it was individual differences between operators in turn management that seemed important.

In conclusion it can be seen that different types of conversation display different patterns of turn-taking. Generally, it was found that the proportion of non-fluencies co-varied with the degree to which the conversation was structured; the highly structured directory enquiry calls had the lowest proportion of non-fluencies and the face-to-face conversations had the highest, with the proportion in travel enquiry calls falling somewhere in between. However, in addition in some conversations individual differences and the particular type of conversation (agreement versus disagreement) were found to influence both the proportion and type of non-fluencies used. It can therefore be seen that the diversity in the patterns of speaker switching in this corpora of conversations will provide a suitable base to rigorously test the

Figure 3.4: Relative frequency of smooth speaker-switches and overlaps when female and male subscribers take the speaker turn from operators
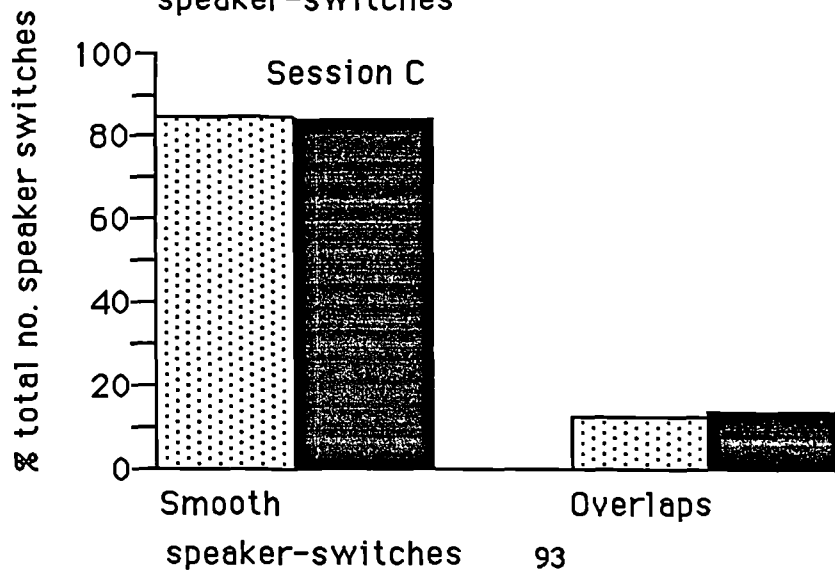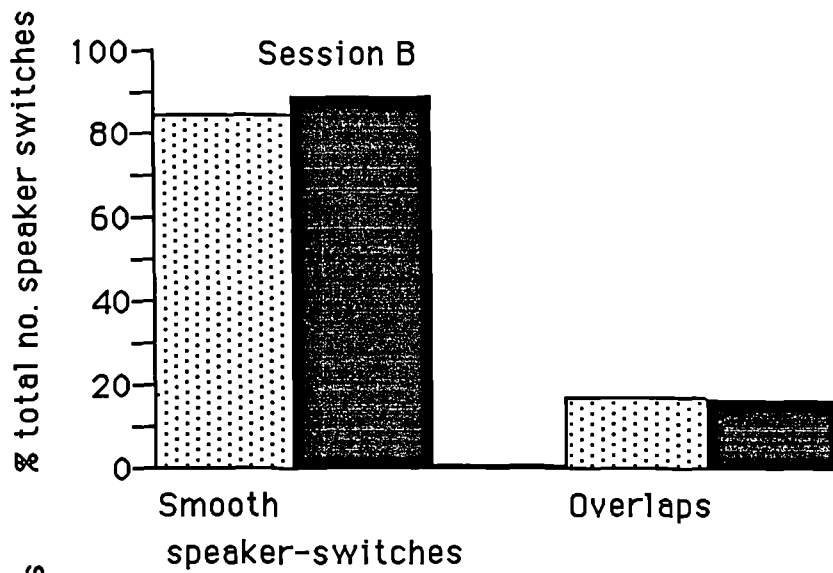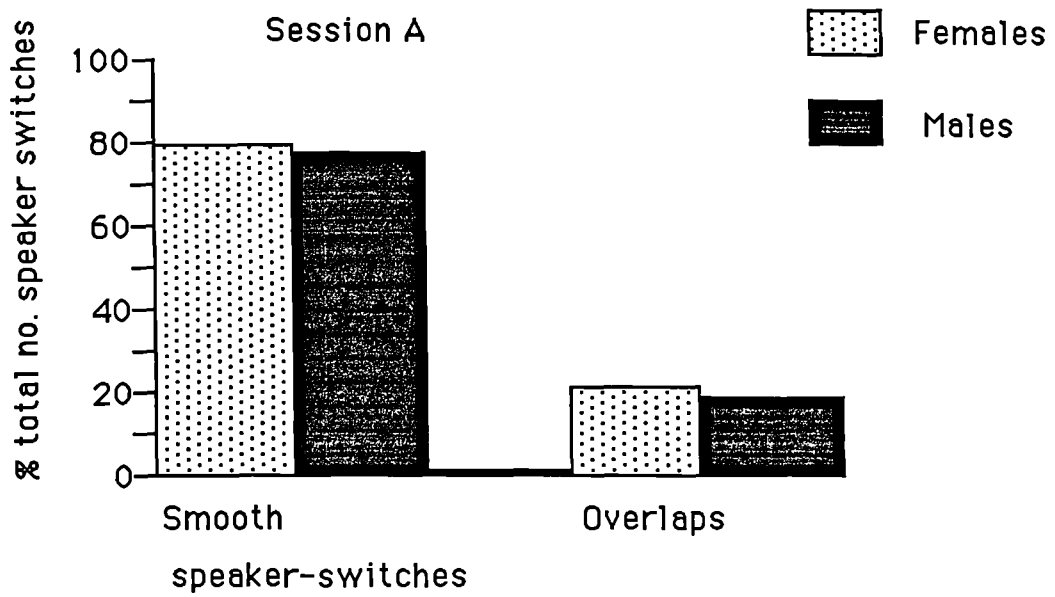
generality of the importance of the turn-taking cues Duncan identified and also from which to base investigations into how speakers use prosodic and textual features to mark their turns at talk.

Note.

1. Suppose that the total number of turn exchanges for group i in agreement is n_i and in disagreement it is m_i. Denote the number of a particular type exchange, for example smooth speaker-switches, by X_{1i} and X_{2i} for the two conditions. Assume X_{1i} is $N(n_i p_i, n_i \sigma^2_1)$ and X_{2i} is $N(m_i p_i, n_i \sigma^2_2)$; this is like the normal approximation to the binomial, except that the structure of the variance is more general. Then the usual (maximum likelihood) estimators of p_1, p_2 are:

$$\hat{p}_1 = \Sigma X_{1i}/N_1, \quad \hat{p}_2 = \Sigma X_{2i}/N_2$$

where $N_1 = \Sigma n_i$, $N_2 = \Sigma m_i$. Also the natural estimates of σ^2_1, σ^2_2 are:

$$\hat{\sigma}^2_1 = 1/g\text{-}1 \; \Sigma n_i (X_{1i}/n_i - \hat{p}_1)^2$$

$$\hat{\sigma}^2_2 = 1/g\text{-}1 \; \Sigma m_i (X_{1i}/m_i - \hat{p}_2)^2$$

where g is the number of groups.

As the two conditions are dependent the covariance between X_{1i} and X_{2i} is:

$$\text{cov}(X_{1i}, X_{2i}) = \sqrt{(n_i m_i)} c$$

$$\hat{c} = 1/g\text{-}1 \; \Sigma \left(\sqrt{(n_i m_i)}\right) (X_{1i}/n_i - \hat{p}_1)(X_{2i}/m_i - \hat{p}_2)$$

Then p1=p2 can be tested by comparing p1-p2 with its estimated standard deviation, which is:

$$\sqrt{\hat{\sigma}^2_1/N_1 + \hat{\sigma}^2_2/N_2 - 2\hat{c}(\Sigma\sqrt{n_i m_i}/N_1 N_2)}$$

Chapter 4

Some Verbal and Nonverbal Cues used in the Regulation of Speaking Turns

4.1. Introduction

The aim of this chapter is to investigate whether the model of turn-taking proposed by Duncan and Fiske (1977, 1985), and modified by Beattie (1981a), can account for the pattern of turn exchange found in the conversations described in chapter 3[1]. This study will thus rigorously test whether the particular turn-taking cues Duncan and Fiske identified play a role in the turn-taking procedure in conversations involving more than two participants and different types of face-to-face and telephone conversations.

The turn-taking model proposed by Duncan and his colleagues was described and reviewed in chapter 2. It is worth noting, however, that Duncan and Fiske stress their belief that their turn system is 'conventional' in nature. That is, the behavioural regularities observed to be involved in the turn-taking procedure are a reflection of the fact that in a particular situation there is a preferred solution to the problem of co-ordinating the speaking turns of the two participants; the interaction is rule-governed. They note that these conventions are maintained through the expectations the participants have of how the other person will act. As a consequence they argue it is not possible to make *a priori* claim about the generality of their results. This is because although the conventions observed may, for example, be used generally by people of that culture they may, on the other hand, only operate in specific situations involving particular participants (1977, p245-304, and more recently in 1985, p62-63). Thus it can be seen that the degree to which Duncan and Fiskes results represent a general model of turn-taking is strictly an empirical issue. However, as Wilson et al., (1984) point out, whilst Duncan and Fiske are circumspect in laying claim to generality, they offer some considerations that suggest that their turn system may have more generality than those obtained from a constrained laboratory set-up. For example, they note the unstructured and naturalistic setting in which the recordings took place, the variation in the topics discussed and the different relationships obtaining between the subjects (some were total strangers and some

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1. It should be emphasized that this study is confined to investigating the generality of turn-taking cues per se. It will not therefore describe the use of back channels and strategy signals (Duncan, 1980) since they depend on and presupposes the fundamental structural organisation of the turn system.

were friends; Duncan and Fiske, 1977, p148-150). Wilson et al., (1984) argue that, since the turn system has been found to operate across the range of dyadic conversations Duncan and Fiske studied, the question of the generality of the turn system is a pressing matter.

According to Duncan's model, the type of turn exchange that occurs is dependent on the degree to which participants co-ordinate their actions at the boundary of a speaking turn[2]. Thus a smooth transition is accomplished collaboratively by adherence to an ordered sequence of three actions, which are as follows:

1) The speaker displays a turn signal in the absence of gesticulation; the number of turn-yielding cues conjointly displayed indicating the speakers willingness to relinquish the speaker turn or transition readiness.
   (It should be emphasized that given the shortcomings in Duncan's original analysis (see chapter 2) his linear model will not be tested here. The analysis of this particular study will be based on the special cue combination account proposed by Beattie, 1981a.)

2) The auditor activates the speaker-state signal and takes the turn without overlapping the previous speaker's turn. You will recall that Duncan and Fiske (1977, 1985) treated any instance of simultaneous speech as a claim for the speaker turn, with the exception of overlaps produced the first speakers use of a sociocentric sequence, filled pause or audible inhalation.

3) The previous speaker relinquishes the speaker turn

In contrast, a simultaneous claim for the speaker turn (or no exchange at all) occurs if a participant acts independently, and thereby omits one of these steps (Duncan and Fiske, 1985, p57-58); for instance a) the auditor may attempt to take the speaker turn either in the absence of any turn-yielding cues (or turn-signal) or whilst the speaker is gesticulating or b) the speaker may fail to yield the turn when an auditor responds to a display of a turn-signal. In terms of this model such occurrences are considered to be momentary breakdowns of the turn system.

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2. Duncan and Fiske did not explicitly define the concept of a speaking turn. They simply note that the boundary of a speaking turn is marked by a smooth exchange of speaker - listener roles (Duncan and Fiske, 1985, p44). However, Wilson et al., (1984) have interpreted this as meaning that the term 'turn' is used to describe a participants undisputed right to the speaker turn. I have also used this interpretation but with the qualification that even when a participant violates the proper order of the turn system, for example by taking over the turn before the first speaker has finished talking, the second speaker is still regarded as holding the speaker turn.

Beattie (1981a) proposed an important modification to this model by suggesting that it was particular combinations that were important in marking the end of a speaker turn rather than the sheer number of turn-yielding cues. In dyadic tutorials he found that the critical combination involved the three following cues; grammatical completion, accompanied by a change in intonation and drawl. However, Beattie (1981a) acknowledged that since differences in dialect have been found to affect prosodic features, the constituents of the special cue combination may vary between participants and across different conversations. He went on to note that the saliency of drawl as a turn-yielding was perhaps the most likely source of variation in the combination; its importance in his study stemmed from the fact that all his subjects used a particular middle-class English dialect in which this characteristic was particularly common and pronounced. Indeed Roth (1981), in his study of disagreements between husbands and wives, found that drawl was not an important turn-yielding cue and the critical combination at smooth speaker-switches involved the two cues grammatical completion and intonation change. More recently, Duncan and Fiske (1985) found, in an assessment study based on 12 dyadic conversations, that drawl, and in addition gesture termination, did not function as effective turn-yielding cues. They noted the need for further research to examine the efficacy of these particular cues on other data sets. Importantly, such work would also provide information about the frequency with which grammatical completion and intonation change form the core cue combination in different types of conversations.

It has been seen that there is evidence that the ability of individual turn-yielding cues to mark turn endings is limited. Of those cues identified, this is perhaps most apparent in the case of grammatical completion; clearly the significance of this turn-yielding cue when it occurs in isolation is limited by its frequent occurrence through out the speaker turn (Beattie, 1981a; Roth, 1981)[3]. Importantly, Roth (1981) found that the completion of a sentence within a turn was also often accompanied by a change in intonation. In other words, the turn-medial utterances in his corpus were marked by the same cue combinations as turn-final utterances. Roth (1981) argued that the behaviours Duncan et al., conceived as 'turn-yielding cues'

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3. Duncan and Fiske (1985) claim that the effectiveness of grammatical completion as a turn-signal depends on the use of particular complex grammatical constructions so that clause completion does not appear at the boundary of every 'unit of analysis' (recall this refers to the way that Duncan and Fiske divided up the stream of the interaction for the purposes of analyses). Simple grammatical construction, they go on to note, would result in grammatical completion occurring at all units and consequently would not effectively differentiate smooth from simultaneous exchanges of the turn. However, this does not overcome the inherent ambiguity caused by the fact that, in terms of Duncan's model, it is regarded as both a turn-yielding cue and a within turn cue.

appeared to be simply the accompaniments of the syntactic features of speech. A number of studies have found that certain nonverbal behaviours mark the ends of speaker turns (for example Kendon, 1967, observed that in dyadic groups speakers looked at their auditor and DeLong, 1974 observed increased kinesic activity). However, Roth was particularly interested in what behaviours informed the other participant(s) that a location was in fact the end of a turn-medial utterance and *not* a turn-final utterance. He acknowledged that whilst in some cases certain factors (such as the lack of ideational completeness or the auditors disinterest in what was being said) may explain why turn-medial utterances marked by turn-yielding cues were not utilised as opportunities to take the speaker turn, he speculated that these locations were distinguished by the use of particular nonverbal behaviours. He looked at the incidence of gesticulation and gaze aversion, two behaviours which Duncan and Fiske (1977, 1985) proposed served to preserve the speaker turn[4]. He found that, compared with turn-final utterances, turn-medial utterances were associated with higher levels of gestural activity and gaze aversion, with gesture accounting for 33% of turn-medial utterances and gaze aversion for 21% (the corresponding figures for turn-final utterances were 11.9% and 6.9%, respectively). Roth (1981) concluded that kinesic behaviours seemed to play a primary role in informing the auditor which boundaries were appropriate for exchanging the speaker turn.

However, there are a number of problems associated with the suggestion that the distinction between turn-final and turn-medial utterances relies on the use of certain visual behaviours. Firstly, there is considerable evidence that individuals not only differ in the amount they gesticulate but that some individuals in some conversations do not gesticulate at all (see for example, Beattie, 1981: Rosenfeld, 1978; Weimann and Knapp, 1975). Thus it is possible that in in some conversations gestural activity would not implicate a significant proportion of turn-medial utterances. Secondly, whilst the direction of the speakers gaze may be important in a group conversation in signalling completion and handing the next turn to a particular participant (Weisbrod, 1965 cited Kendon, 1967; Beattie, 1981b; Harrigan and Steffen, 1983), its use as a turn-preserving behaviour is complicated by the fact that there are a number of participants from whom the speaker can avert gaze. It may be the case that as a result of this complication any shift in gaze is regarded as a continuation signal or that turn-final and turn-medial utterances are distinguished by a particular pattern of gaze but clearly this requires investigation. Furthermore, in a group conversation the use

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. Roth argued that whilst Duncan and Fiske examined gaze aversion in terms of its consequence for auditor turn-taking attempts, its function as a within turn marker means that it is suitable for examination as a turn preserving behaviour.

of nonverbal cues may not necessarily be straightforward. It has been found that in dyadic conversations the listener often does not look at the speaker (Rutter et al., 1978) but in a group conversation there is perhaps greater possibility that at least one of the participants will be looking elsewhere since the 'responsibility' of directly responding to the speakers talk is distributed amongst all the participants. Thus for instance, during a speaker's talk one of the auditors may take the opportunity of looking at another participant to try and gauge their reaction to what is being said. Similarly, in the case of a disagreement, a participant may look at their lap in an effort not to appear as if they are taking sides, although they may be keen to take the next speaker turn to diffuse the disagreement. Obviously, on such occasions the participant would miss the relevant turn-preserving behaviour if it was communicated visually. Thus in order to avoid this eventuality it is possible that in group conversations participants may make more use of linguistic features to distinguish turn-final and turn-medial locations. These locations may not be distinguished in terms of the use of turn-yielding cues per se. As Wilson et al., (1984) argue, one of the main weaknesses of Duncan and Fiskes model is the assumption that turn-yielding cues are identifiable independently of context; they suggest 'cues' are best regarded as discretionary resources which need not be interpreted in the same manner (i.e. signalling completion) every time they are used. Thus it could be the case that turn-final and turn-medial locations are distinguished by differential use, either in number or type, of turn-yielding cues. Whilst the local variation of such cues would not explain how participants are able to correctly distinguish turn-final and turn-medial locations, it would provide support for the call not to prejudge the function of certain conversational events (Wilson et al., 1984). In addition, knowledge of this variation may help direct future research as to what other factors are of importance in the regulation of the turn-taking process. Finally, with respect to telephone enquiries it was suggested that the structure of the task may be important in the management of speaker turns (see chapter 3). In contrast, Duncan and Fiske in emphasizing the discrete nature of their turn-yielding cues, clearly do not entertain this possibility. Thus it need hardly be said that the importance they place on visual cues in preserving the turn immediately poses the question of how sentential boundaries within a turn distinguished from those at turn-final locations during telephone conversations? In other words, the suggestion that nonverbal behaviours may distinguish turn-final and turn-medial utterances does not necessarily afford an explanation of how a speaker switch is actualised at a particular location in a group conversation. Furthermore, it offers no explanation of how this is accomplished during telephone conversations.

It has been noted that on some occasions speaker-switches occur because one of the participants violates the order of the turn system. In Duncan and Fiske's (1977, 1985) exploratory and replication studies they observed that 57% of violations of the turn

system were attributable to the speaker displaying turn-yielding cues but failing to relinquish the speaker turn. Roth (1981) suggested that this observation is misleading as Duncan and Fiske did not differentiate the different types of nonfluencies and yet clearly if a large proportion of these observations were accounted for by overlaps, rather than interruptions, this would give rise to a very different interpretation of the data. Roth, using Ferguson's (1977) scheme to classify the different types of turn exchanges, found that of those initiation points of non-fluencies marked by turn-yielding cues, 70% were overlaps. He thus concluded that turn-yielding cues not only mark the ends of turns but also play an important role in predicting the ends of some speaker turns. Roth, however, did not investigate whether overlaps and interruptions were also distinguished by the incidence of turn-yielding cues at the termination of the simultaneous speech; it could be the case, for example, that when an overlap occurs the first speaker uses turn-yielding cues at the end of their talk to indicate that the second speaker did correctly interpret the predictive cues and that the first speaker has reached a completion point. Furthermore, examination of the incidence of turn-yielding cues in the first speakers talk at the initiation points of silent and simple interruptions and, in addition, at the termination points in the case of simple interruption, could give an insight into the origin of the interruptions in the range of conversations which form the basis of this research.

Duncan and Fiske (1977, 1985) claimed that in order to facilitate co-ordination of the participants actions at a turn boundary, the auditor communicates their intention to take the speaker turn by displaying the speaker state cue. This consists of the display of at least one of the two constituent cues; shift in head away from previous speaker and or the initiation of gesticulation. They also observed that the display of the speaker-state cue was implicated in resolving instances of a simultaneous claims for the speaker turn in favour of the second speaker. Importantly, however, looking at the results of Duncan and Fiskes initial study and their subsequent replications it can be seen that there is quite considerable variation in the use of this signal; between 62% and 95% of turn-beginings were marked by the display of a speaker-state cue (see Duncan and Fiske, 1985, Table 6.3, p107). However, it is not known whether or not its use is related to particular types of turn exchange and not to others. In addition, its use may also depend on the type of conversation; for example, the speaker-state cue may be used more frequently in disagreement as the auditor, in the face of the competition for the speaker turn, aims to make clear their intention with respect to the turn. However, it could also be argued that the use of the speaker-state cue is unlikely to be of fundamental importance in exacting a smooth exchange of speaker-auditor roles in conversations since from the results of the analysis in chapter 3 we know that telephone conversations proceed very smoothly without the aid of this set of cues.

In summary, Duncan and Fiskes' claim that the occurrence of a smooth speaker-switch is dependent on the co-ordination of the first and next speakers' action has been outlined. It has been seen that there is evidence that the speakers' use of combinations of turn-yielding cues distinguish smooth speaker-switches from interruptions but not from overlaps. It is not known, however, if overlaps and interruptions are marked differently at the termination points of simultaneous speech. It has been suggested by one investigator that turn-yielding cues are more accurately regarded as simply the accompaniments of speech since they have been found to occur at turn-medial locations; it has been proposed that the use of particular nonverbal visual behaviours mark turn-medial locations and thereby distinguish them from turn-final locations. However, it was noted that this finding may not generalise to other conversations, in particular face-to-face group conversations. It was suggested that in these conversations the differential use of linguistic features may play a role in distinguishing turn-final and turn-medial utterances. It was also proposed that the use of speaker-state cues may not be crucial to the smooth organisation of speaker turns and may vary according to the type of turn exchange and or type of conversation. This study will investigate these issues using samples of conversations taken from the corpus of group, face-to-face conversations, directory enquiry calls and travel enquiry calls.

4.2. The face-to-face conversations

4.2.1. Method

For this study 6 discussion groups were analysed. In this sample there were 449 speaker-switches; 267 were smooth speaker-switches, 95 were overlaps and 87 were interruptions. For each group every speaker-switch (excluding multiple starts), that had been classified according to the criteria noted in chapter 3, was examined for the presence of any of the 5 turn-yielding cues identified by Duncan and his colleagues. For overlaps and simple interruptions this included examining the initiation points and termination points of the simultaneous speech. By means of a contrast, the incidence of turn-yielding cues at sentential boundaries within a turn, which preceded a smooth speaker-switch (and were therefore examples of undisputed medial utterances) were also examined. In total there were 273 turn-medial utterances. It should be emphasized that in the introduction to this thesis (chapter 2) it was argued that in order to assess the importance of turn-yielding cues it is necessary to investigate how they are used at locations that are pertinant for turn-taking (i.e. sentential boundaries within a turn and at the end of a turn) rather than at 'units of analysis'.

It is important to note that this analysis was based on the recent list of

turn-yielding cues, which was given in Duncan and Fiske (1985). Below follows a brief outline of these cues (see chapter 2 for a more detailed exposition):

1. Completion of grammatical clause - containing subject-predicate combination and including instances of elliptical grammatical completion. There follows two examples of elliptical grammatical completion:

   a) Sally: With what?
      Lynn: Males
      (Group 3: 04.31)

   b) Mark: The previous one? (said with rising intonation)
      Sue: Yes
      (Group 5: 00.33)

   It should be noted that the broadening of this definition to include ellipsis resulted in 22 smooth speaker-switches and the initiation point of one overlap being re-classified as grammatically complete.

2. Sociocentric sequences - consisting of stereotyped expressions such as 'you know' and 'or something'.

3. Intonation - changes in pitch were recorded (the nature of these changes, that is whether the pitch was rising or falling, was not noted).

4. Drawl - present on either the final syllable or stressed syllable of the terminal clause. (It should be noted that this involves a subjective impression of syllable lengthening, cf. Cutler and Pearson, 1985)

5. Gesture termination - including the relaxation of any tensed hand position (such as a fist) but excluding self and object adaptors (that is self-touching or the manipulation of objects, Ekman and Friesen, 1969).

It should be noted that as Duncan regarded gesticulation as serving to maintain the current speaker turn and to nullify the effect of any turn-yielding cue(s) being displayed, its occurrence was also recorded.

*Further details about the nature of the relationship between participants, topics of the conversations and transcripts are available from the author.

At turn-medial locations the occurrence of a shift in gaze was also recorded[5]. Thus a shift in gaze either towards or away from any conversational partner which occurred within a phonemic clause preceding the sentential boundary and extending to the word following the first stressed syllable after that boundary was recorded. The direction of the speakers gaze at this location was also recorded. For the sake of comparison changes in and direction of gaze at turn-final locations, preceding a smooth speaker-switch, were also noted.

The incidences of speaker-state cues displayed at the begining of each turn, within the location restrictions outlined by Duncan and Fiske (1977, 1985), were recorded. Thus the initiation of gesticulation and or the shift in gaze away from one of the conversational partners[6] was noted if it occurred within the speech extending from the phonemic clause preceding the second speakers verbalisation to the onset of the first word following the syllable carrying primary stress within the first phonemic clause of the second speakers talk.

Reliability

Inter-observer reliability between two judges in identifying the turn-yielding cues was 89%[7]. The test re-test reliability was 92%. It should be noted that the reliability in identifying turn-yielding cues ranged from 80% in the case of drawl to 98% in the case of clause completion. Reliability was calculated on a sample of 40 speaker-switches and 20 turn-medial utterances.

Inter-observer reliability in judging head direction at the end of turn-final and turn-medial medial utterances (that is grammatical completions within a turn) was 85% and the test re-test reliability was 90%. This reliability check was based on the viewing of 40 turn-final and 20 turn-medial utterances.

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5. Duncan and Fiske (1985) stated that either a shift in the speakers gaze towards their partner (within-turn cue) or by a shift in gaze away (continuation signal) can mark a turn-medial location. As in this corpus in each group there are 3 possible 'partners' any shift in the speakers *head direction* was recorded. It is important to note that when Duncan and Fiske (1977, 1985) use the term gaze, they in fact transcribed the speaker head direction. They point out that, given the resolution of some of their videotapes, head direction could be more accurately transcribed than gaze and that the former is indication of the latter.
6. As was pointed out in footnote 5., the transcription of gaze involved noting head direction.
7. It should be noted that one of the judges involved in these reliability checks (and the ones reported later in this chapter) was not familiar with Duncan and Fiske's model and, in addition, was not told whether any particular utterance was turn-final or turn-medial. It was hoped that these precautions would provide a rigorous check on the initial classifications made by this author.

Inter-observer reliability in identifying either or both of the speaker-state cues was 88% and the test re-test reliability was 93%. For these cues reliability was calculated on a sample of 40 turn beginings, 10 from each category of speaker-switch.

Analyses of the data

To test the hypothesis that the display of turn-yielding cues discriminates smooth exchanges from simultaneous claims for the turn, the incidence of the display of at least one turn-yielding cue was compared for each speaker exchange using the Friedman Test. This test was carried out separately for the data yielding from the agreement and disagreement conditions and within each condition the comparison was carried out twice; once it included the information about the display of turn-yielding cues at the initiation of overlaps and simple interruptions and the second time information from their termination points. When the Friedman Test was significant a Multiple Comparisons Test was used to determine where the differences were located. The formula used in this study is given in Daniel (1978, p231). A Wilcoxon Matched-Pairs Signed-Ranks Test was used to compare the incidence of the display of turn-yielding cues in agreement and disagreement for each speaker-switch. In order to investigate the use of speaker-state cues, a Friedman Test was used to compare the frequency of its display across different types of speaker-switches and a Wilcoxon Matched-Pairs Signed-Ranks Test was used to compare its use in agreement and disagreement for each speaker-switch. Two further points should be noted. Firstly, all tests were two-tailed and, secondly, as the total number of each type of speaker-switch varied between groups this analysis was based on percentage occurrence of turn-yielding cues. The percentage was computed from the frequency with which turn-yielding cues were displayed expressed as the total number of exchanges involving that particular speaker-switch in each group. The raw data for each group, however, can be found in Appendix IV.

4.2.2. Results

Turn-yielding cues

Turn-final utterances

Table 4.1 shows the relationship between the mean percentage of turn-yielding cues conjointly displayed (without the attempt-suppression signal, gesticulation[8]) and the different speaker switches in agreement and disagreement. It should be noted that in the case of silent interruptions in agreement the mean percentage is misleading since silent interruptions occurred very infrequently (a total of 5 times). This data was therefore excluded from the statistical analysis below. By comparing the proportion of utterances marked by turn-yielding cues at the different speaker-switches (here including the data for the initiation points of overlaps and simple interruptions) it can be seen that in both conditions smooth speaker-switches were distinguished from the remaining speaker-switches by the display of at least one turn-yielding cue. Indeed a Multiple Comparisons Test showed that this accounted for the significant difference between the display of turn-yielding cues and type of turn exchange (for agreement, $\chi^2_r = 9.3$, df=2, p<0.01 and for disagreement $\chi^2_r = 9.1$, df=3, p<0.05). When the same comparison was carried out but this time using the data from the termination points of overlaps and simple interruptions, it was found that in agreement smooth speaker-switches and termination point of overlaps were distinguished from the termination point of simple interruptions by the proportion marked by the display of at least one turn-yielding cue. Statistical analysis showed that this accounted for the significant difference between the type of turn exchange and the display of turn-yielding cues ($\chi^2_r = 9.3$, df=2, p<0.01). Similar results were obtained for disagreement but in this case the significant result stemmed from the difference between smooth speaker-switches and the termination of overlaps compared with silent interruptions and the termination point of simple interruptions ($\chi^2_r = 14.6$, df=3, p<0.01). When the display of turn-yielding cues (as opposed to zero display) was compared in agreement and disagreement for each type of speaker-switch, none of the Wilcoxon Tests were significant. In other words, it can be seen that the display of turn-yielding cues distinguishes smooth speaker-switches from all non-fluencies except those that arise from the initiation points of overlaps.

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8. Turn-yielding cues rarely occurred in conjunction with gesticulation. In this corpus there were only 7 such instances and all implicated either a simple or silent interruption (see appendix IV, Tables B.4a&b, B.5, B.8a&b and B.9 for further details). As a result of this infrequency it is clearly not possible to carry out any statistical analysis on this sub-set and it has therefore been excluded from the analysis.

Table 4.1: Relationship between the mean percentage of turn-yielding cues conjointly displayed and different speaker switches (no attempt-suppressing signal displayed) during face-to-face conversation

Number of turn-yielding cues conjointly displayed	Smooth speaker switches	Overlaps		Simple		Silent
		Initiation	Termination	Initiation	Termination	
greement						
0	1.4	83.9	0	64.2	91.7	50.0
1	9.1	6.1	1.4	17.2	8.3	50.0
2	60.6	6.7	81.7	15.8	0	0
3	24.1	3.3	15.5	2.8	0	0
4	4.8	0	1.4	0	0	0
5	0	0	0	0	0	0
isagreement						
0	0	76.2	1.1	80.6	85.6	70.8
1	5.4	1.7	22.2	16.7	2.8	16.7
2	59.2	22.1	55.9	2.8	8.3	12.5
3	29.6	0	17.6	0	3.3	0
4	5.8	0	3.1	0	0	0
5	0	0	0	0	0	0

In addition, it was found that speakers mark their turns in a similar manner in agreement and disagreement.

The next stage of the analysis was directed towards establishing which turn-yielding cues were most frequently associated with each type of speaker-switch. Table 4.2 shows the mean percentage of speaker-switches that were marked by the display of individual turn-yielding cues. For smooth speaker-switches in agreement it can be seen that grammatical completion was the most frequently used turn-yielding cue. This cue tended to be accompanied by intonation change. It was found that 92% of changes in intonation occurred in conjunction with grammatical completion and only on 9% of smooth speaker-switches were marked by grammatical completion in isolation from changes in intonation. In contrast, in disagreement intonation change was the most frequently used cue. However, grammatical completion occurred in 97% of all smooth speaker-switches marked by a change in intonation whereas only 3% of smooth speaker-switches marked by a intonation change occurred in isolation from grammatical completion. Thus it can be seen that for smooth speaker-switches in both conditions grammatical completion and intonation change were the most frequently used combinations of turn-yielding cues. For the purposes of illustration a figure (4.1) has been included which shows the trace of the fundamental frequency in an utterance marked by a change in intonation - in this case a pitch fall (see note 1 at the end of this chapter). In contrast, it was observed that there were pronounced individual differences in the use of drawl and gesture termination to mark smooth speaker-switches[9]. In the case of one individual drawl was implicated in 33% of their smooth speaker-switches whereas in the case of five other individuals this cue was not involved at all. Similarly, whilst gesture termination marked 60% of one individuals smooth speaker-switches[10], four individuals did not use this cue at this location. However, it is important to note that on approximately 90% of occasions when either of these cues were used, they occurred in conjunction with grammatical completion and changes in intonation.

Figure 4.2 shows the direction of speaker gaze at turn-final utterances. It can be seen that in both conditions when a smooth speaker-switch occurs the first speaker is typically looking at the next speaker. It was found that in agreement 11.9% of

9. As sociocentric sequences were only used 8 times in this corpus it is not possible to draw any conclusions about whether individuals differ in their use. However, it is interesting to note that they were only implicated in the talk of 4 participants, 3 of which were in the same group.

10. Overall 73% of the terminated gestures were speech focussed movements (that is simple hand movements such as batonic movements) and the remaining were more complex gestures, which reflect the meaning of what was said.

Table 4.2: Mean percentage of speaker-switches marked by the display of individual turn-yielding cues (no attempt-suppression signal displayed) during face-to-face conversation

Turn-yielding cues	Smooth switches	Overlaps		Simple		Silent
		Initiation	Termination	Initiation	Termination	
Agreement						
Clause	94.0	9.1	100.0	21.4	8.3	16.7
Socio.seq.	2.3	0	0	2.8	0	0
Intonation	88.8	10.0	98.6	16.4	0	16.7
Gest. term.	22.2	7.0	14.0	8.3	0	0
Drawl	15.4	3.3	4.3	0	0	0
Disagreement						
Clause	93.9	22.1	77.8	19.5	8.9	8.3
Socio.seq.	3.3	0	16.7	0	5.6	4.2
Intonation	96.4	22.1	81.1	2.8	8.3	12.5
Gest. term.	24.4	0	20.8	0	0	8.3
Drawl	20.5	0	3.1	0	3.3	0
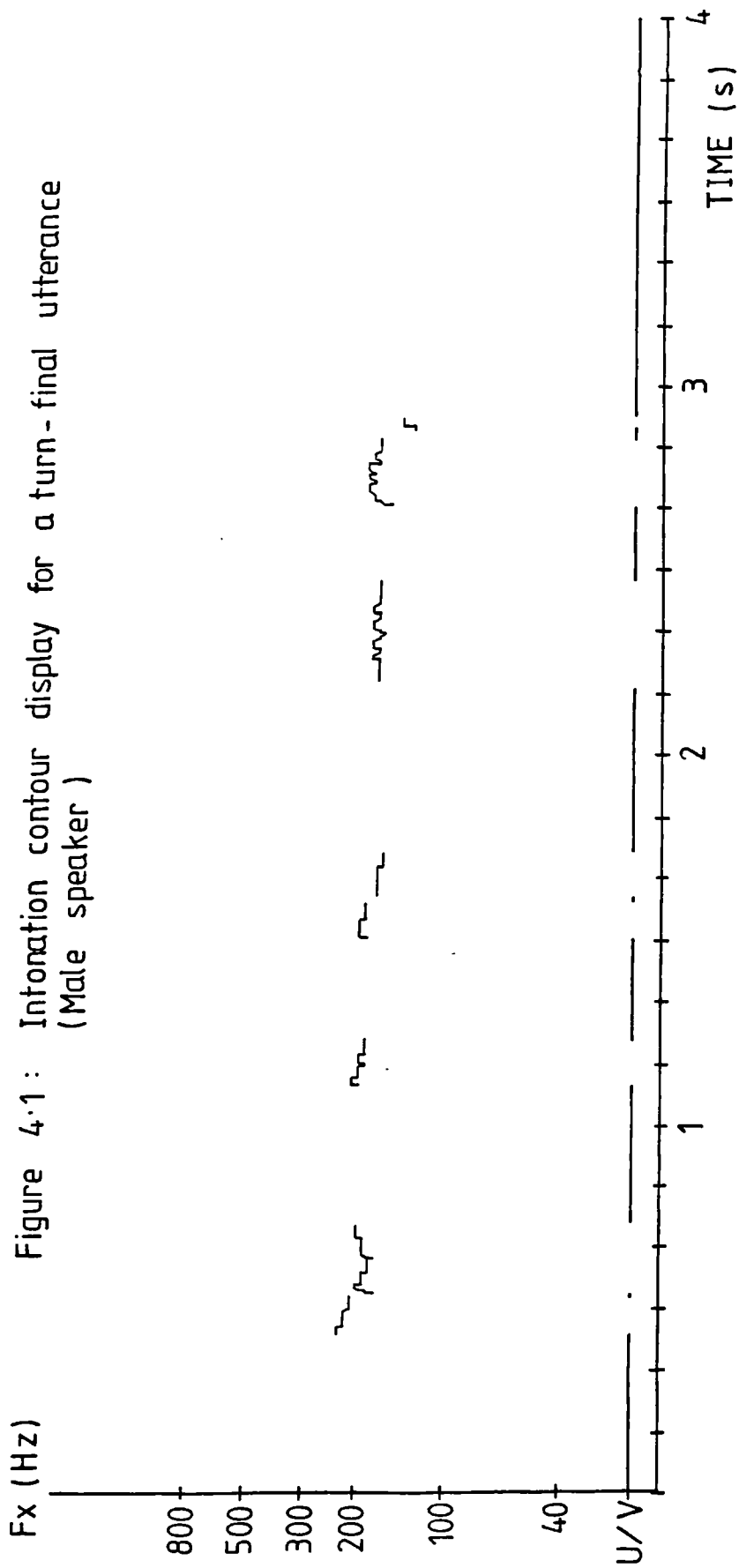
Figure 4·1 : Intonation contour display for a turn-final utterance
(Male speaker)

Fx (Hz)

800
500
300
200
100
40
U/V

1   2   3   4

TIME (s)

109

a) Agreement

First speaker

Next speaker

First=next speaker

Other

None

Mean % of turn-final

Direction of gaze

b) Disagreement

Mean % of turn-final

Direction of gaze
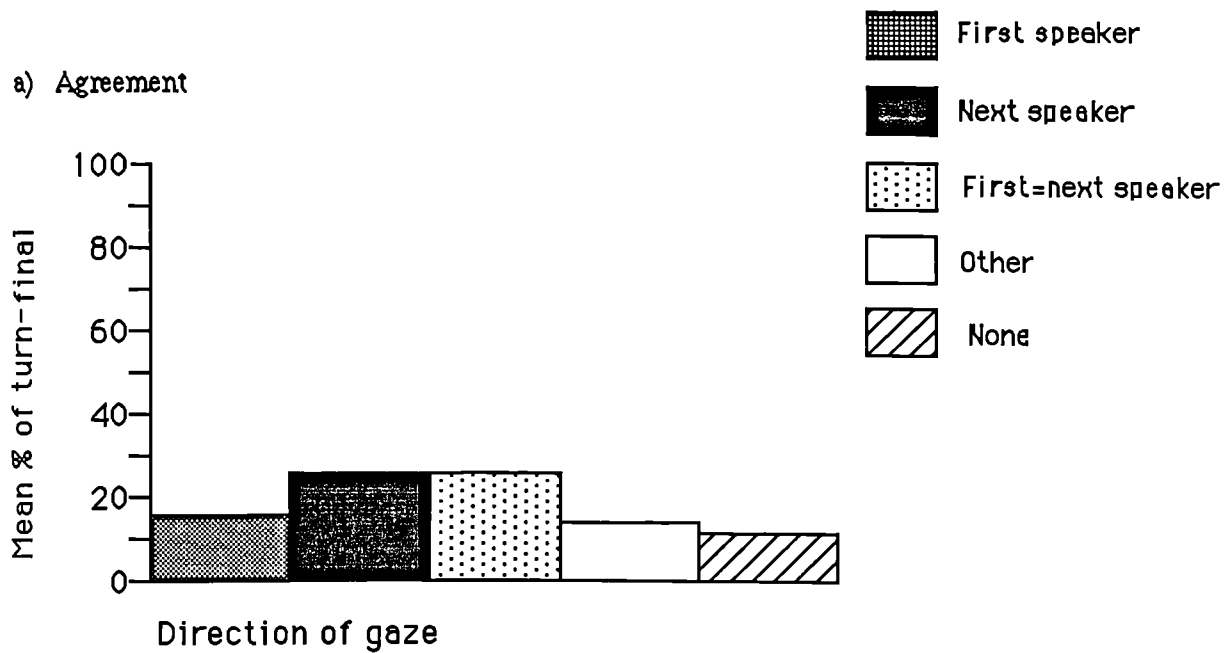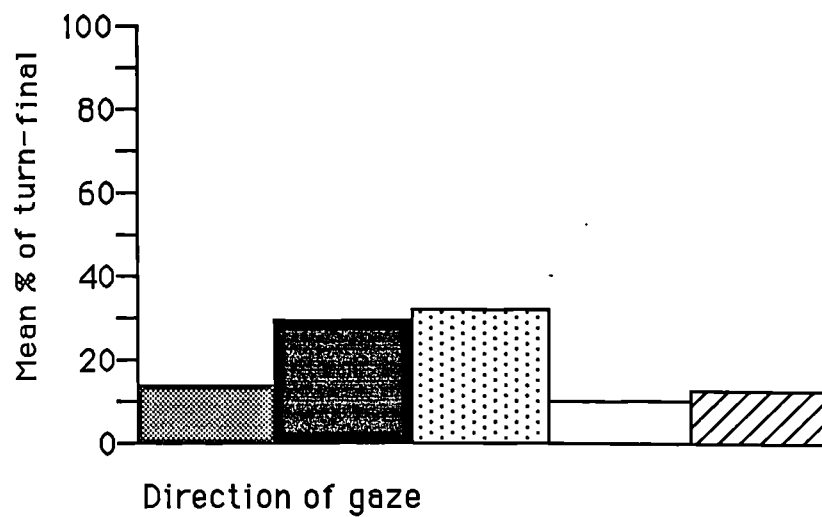
smooth speaker-switches were preceded by a shift in the speaker gaze and in disagreement 15% were marked in this way. However, it should be noted that the shift in gaze did not implicate any particular sequence. In other words, it was not the case that the speaker typically averted gaze from a particular participant to another.

From Table 4.2 it can be seen all termination points of overlaps in agreement were marked by grammatical completion. A change in intonation accompanied 98% of grammatical completions at these locations. Only 2% of grammatical completions at these termination points occurred in isolation from intonation change. In disagreement, intonation change was the most frequently used cue. However, on 98% of occasions it occurred in conjunction with grammatical completion. In short, as with smooth speaker-switches, the most frequent cue combination at the termination points of overlaps was grammatical completion and intonation change. (Analysis of individual differences in the use of drawl and the cessation of gesticulation was not possible as these cues occurred relatively infrequently.)

It should be noted that of those interruptions marked by turn-yielding cues grammatical completion and intonation changes were most frequently implicated, see for example the initiation of silent and simple interruptions in agreement and the termination of simple interruptions in disagreement (Table 4.2). From this table it also appears that the degree of importance of these cues varies between locations, for example compare the initiation of simple interruptions with silent interruptions in disagreement. However, one must be reserved about drawing such a conclusion given that these particular proportions are based on low frequencies (see Appendix IV, Table B.8a&b).

Turn-medial utterances

In the next stage of the investigation, sentential boundaries within a speaker turn that preceded a smooth speaker-switch, were examined for the presence of one of the three other turn-yielding cues. From Figure 4.3 it can be seen that in agreement and disagreement a notable proportion of turn-medial utterances were marked by one turn-yielding cue - grammatical completion (of course as this analysis involved examining sentential boundaries all locations were effectively marked by at least one turn-yielding cue). Figure 4.4 shows the trace of the fundamental frequency of an utterance that was just marked by grammatical completion. However, the highest conjoint frequency of turn-yielding cues at turn-medial boundaries was two. It should be noted that two cue displays implicated a higher proportion of turn-medial utterances in agreement than in disagreement. This difference, however, just failed to reach significance (Wilcoxon Test, T=1, n=6, p<0.07). Nevertheless, from Figure 4.5 it

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Figure 4.3 : Relationship between number of turn-yielding cues conjointly
displayed and turn-medial utterances in agreement and disagreement
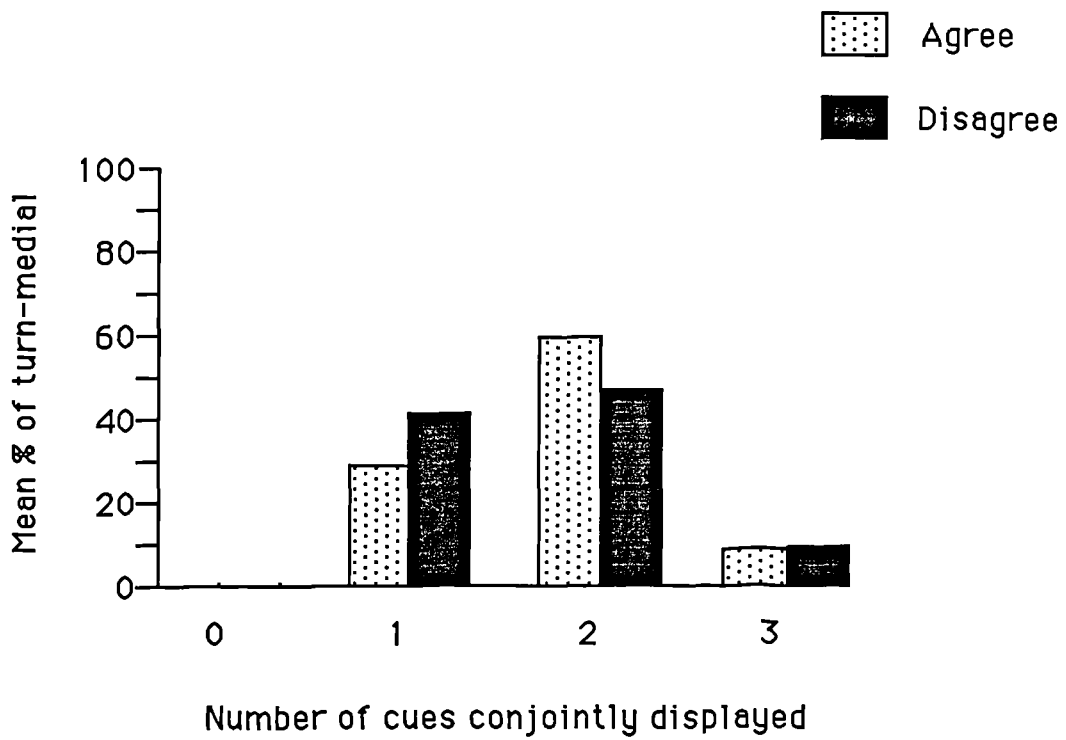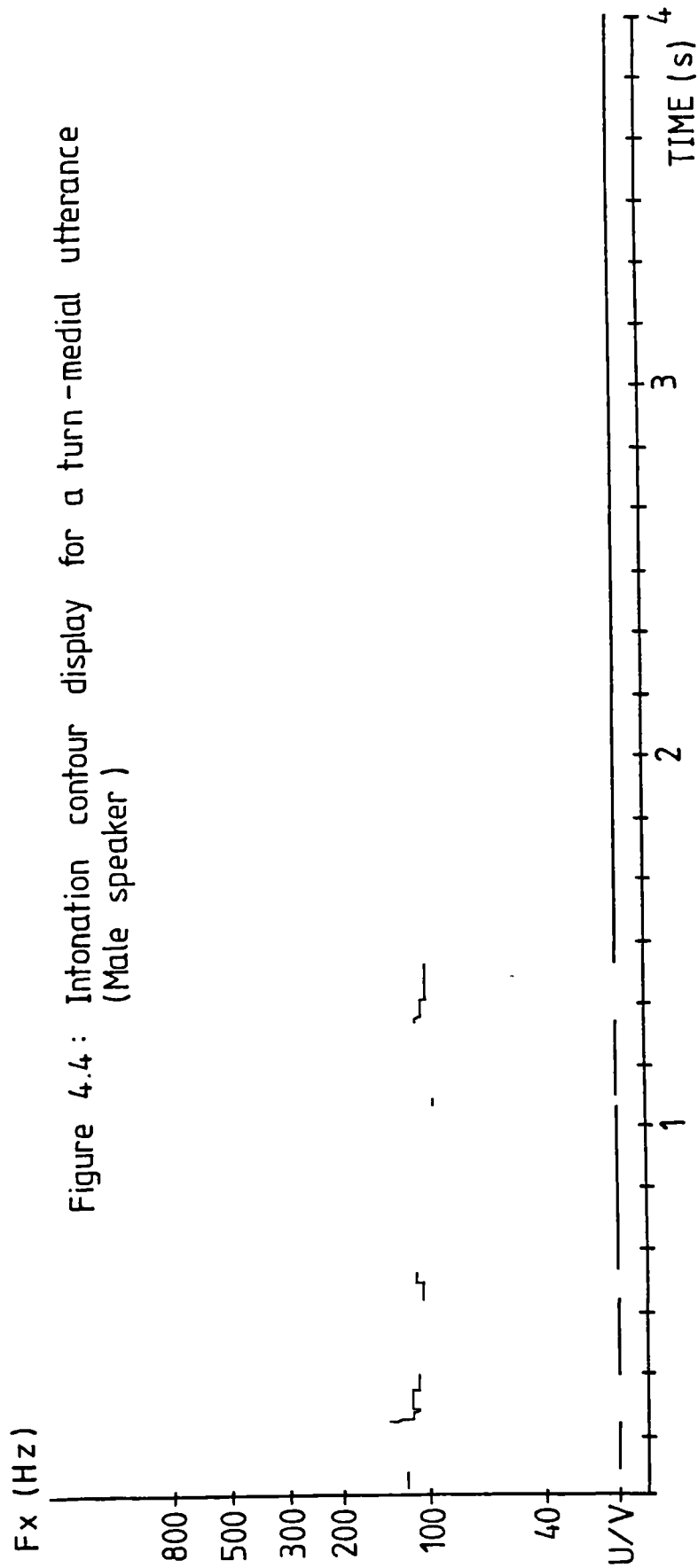
Figure 4.4 : Intonation contour display for a turn-medial utterance (Male speaker)

113

Figure 4.5: Mean percentage of turn-medial utterances marked by individual turn-yielding cues

a) Agreement

Clause

Socia.seq

Intonation

Gest.term

Drawl

Type of turn-yielding cues

b) Disagreement

Type of turn-yielding cues
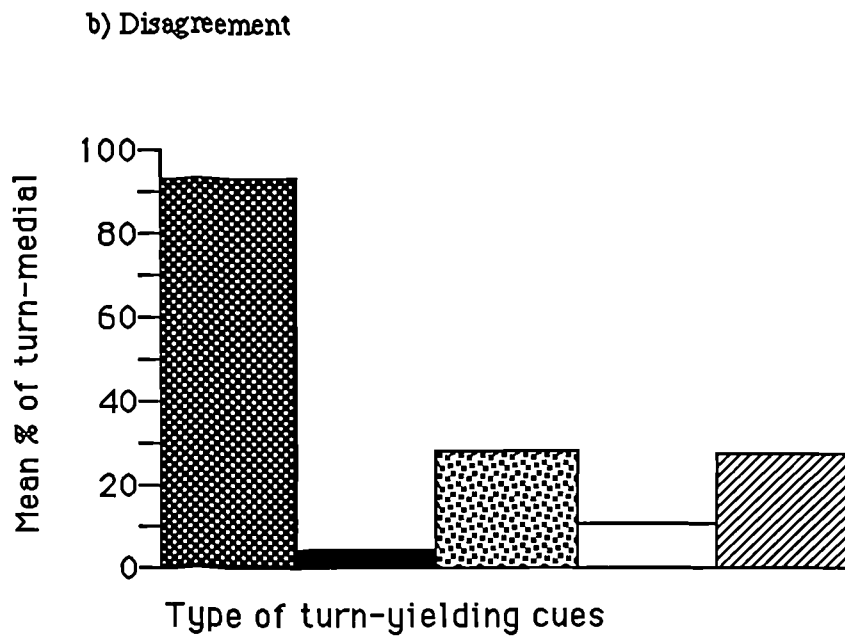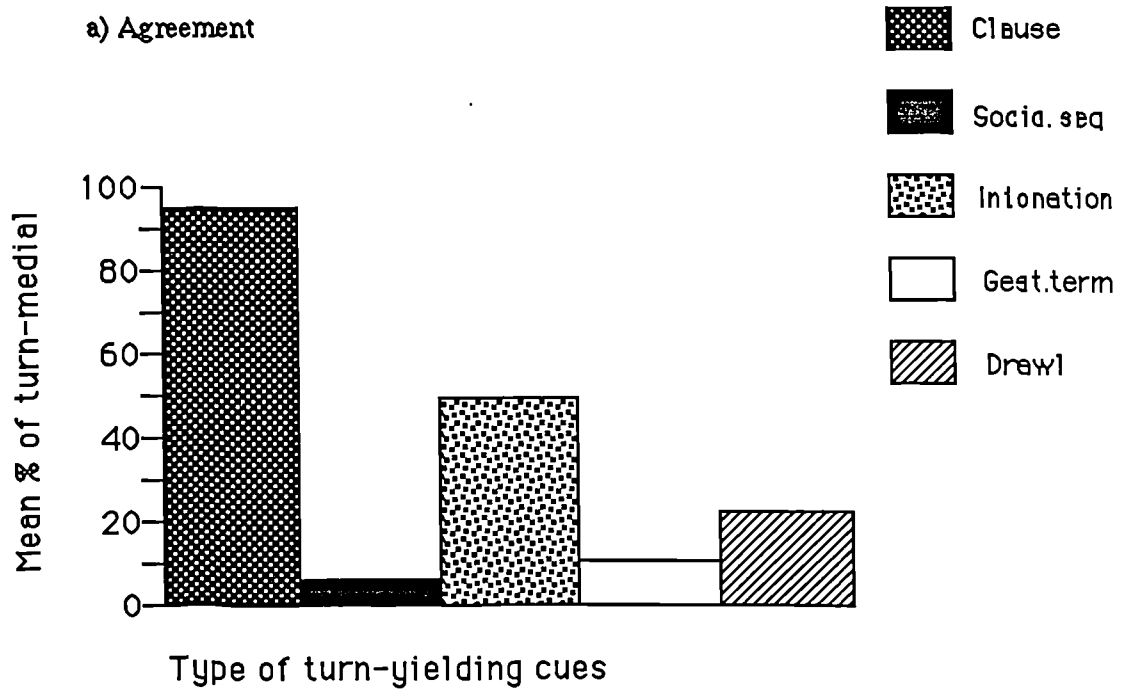
can be seen that this trend is mainly attributable to the frequency with which changes in intonation occurred in each condition. In agreement the most frequent cue combination was grammatical completion accompanied by a change in intonation. This accounted for 64% of all two-cue displays in agreement. Grammatical completion accompanied by drawl was also important, accounting for 32% of all two-cue displays. In contrast, in disagreement the combination of grammatical completion and intonation change only accounted for 48% of all two-cue displays and grammatical completion and drawl for 37%. At this juncture it is important to note that drawl was used generally by all but two of the participants.

The attempt-suppressing cue was only observed 13 times at turn-medial boundaries in agreement and 11 times in disagreement; in each condition it thus accounted for 8.4% and 9.2% of turn-medial utterances, respectively. In agreement on eight occasions two-cue displays were implicated and on five occasions, three-cue displays. In contrast, in disagreement gesticulation occurred nine times in conjunction with three-cue displays and only twice with two-cue displays. Interestingly, as three-cue displays occurred relatively infrequently gesticulation effectively overrode 50% of these displays in agreement and 90% in disagreement.

From Figure 4.6. it can be seen that at turn-medial boundaries in agreement and disagreement the current speaker was typically looking at the previous speaker. In disagreement, however, the previous speaker was also frequently the next speaker. It is important to note that in agreement only 5.8% of turn-medial utterances were marked by a shift in gaze. The corresponding figure for disagreement was 7.6%. There was no discernable pattern in the shifts in gaze.

The turn-final/turn-medial comparison

It was found that turn-final utterances, preceding a smooth speaker-switch, differed from turn-medial in the proportion marked by one or three turn-yielding cues. However, for both types of utterance in both conditions the highest conjoint frequency of turn-yielding cues was two (compare Table 4.1 with Figure 4.3). Importantly, however, when the turn-medial utterances, which immediately preceded a smooth speaker-switch, were compared with the turn-final utterance that followed, it was found that in agreement 65% of all turn-medial utterances were marked by less turn-yielding cues than their corresponding turn-final utterance. In disagreement 72% were marked by less turn-yielding cues. In other words, despite the relatively large proportion of two-cue combinations at turn-medial utterances, in terms of the number of cues conjointly displayed the majority of turn-medial utterances, which immediately preceded a smooth speaker-switch, were marked differently from their respective

Figure 4.6: Speakers' direction of gaze at turn-medial utterances

First speaker
Next speaker
First=next speaker
Other
None

a) Agreement

Mean % of turn-medial

Direction of gaze

b) Disagreement

Mean % of turn-medial

Direction of gaze
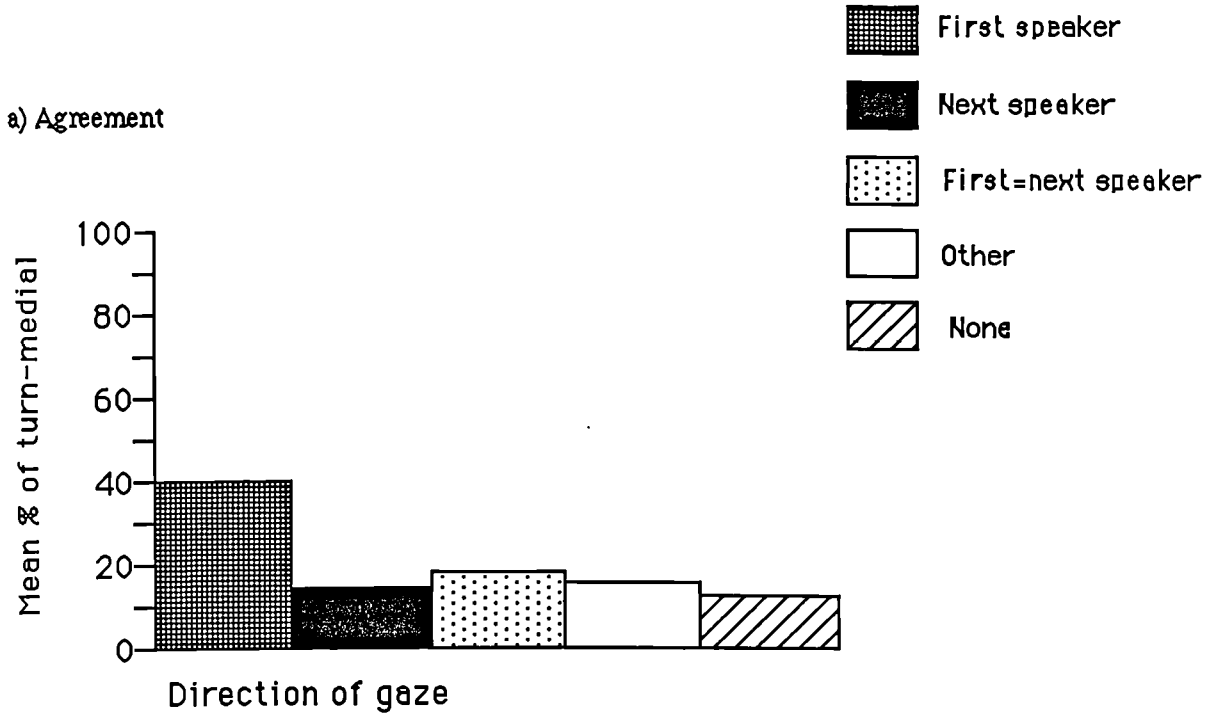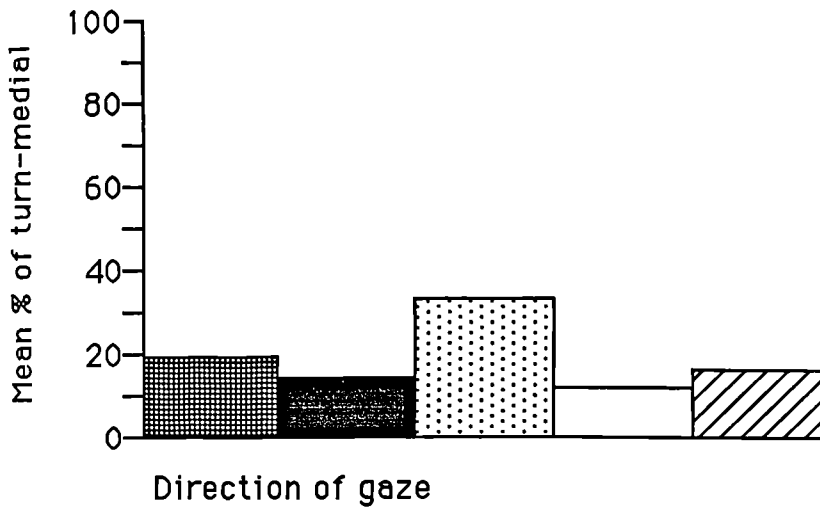
turn-final utterances; therefore it seems that turn-yielding cues do not have a fixed function as Duncan and Fiske suggested.

When the types of cues used at turn-final and turn-medial utterances were compared it was found that only the use of drawl distinguished these locations. Whilst some individuals only used drawl at smooth speaker-switches, some only used it at turn-medial locations. The possibility that these individuals may therefore use it as a means of differentially marking these two types of utterances was explored; for example, those individuals who did not use it to mark turn-final utterances could have used it at turn-medial locations (and vice-versa). It was found that of those five individuals who did not use drawl to mark turn-final utterances, three used it at turn-medial locations. Of the two individuals who did not use drawl at turn-medial locations, only one used it to mark turn-final utterances. In other words, there is some evidence, although it is by no means conclusive, that some individuals may use drawl differentially to distinguish turn-final and turn-medial locations.

By comparing Figures 4.2 and 4.6 it can be seen that there are differences between turn-final and turn-medial utterances in the pattern of gaze. In particular at turn-final locations the speaker tended to look more frequently at the next speaker than at the last speaker and vice-versa at turn-medial locations. When the direction of gaze at turn-final utterances was compared with the immediately preceding turn-medial utterance, it was found that in agreement on 12 occasions (involving 7.8% of turn-medial utterances) these locations had different patterns of gaze. In disagreement *the corresponding figure was 12 (and 12%)*. Of these instances gaze was the only feature to distinguish these locations (in agreement this occurred on 8 occasions and in disagreement on 6 occasions).

Speaker-state cues

Figure 4.7 shows the mean percentage of speaker-switches marked by at least one of the two speaker-state cues. It can be seen that in agreement and disagreement speaker-state cues were used relatively infrequently (given that, for example Duncan and Fiske (1985) reported that in the conversations they had observed between 62-95% of turn beginings were marked by at least one of these cues). When the display of speaker-state cues was compared for the different speaker-switches (of course for agreement silent interruptions were excluded) it was found that in both conditions there was no significant difference between the type of speaker-switch and the display of speaker-state cues (for agreement, $\chi^2_r=3.2$, df=2, n.s. and for disagreement, $\chi^2_r=4.3$, df=3, n.s.).

Figure 4.7: Mean percentage of speaker-switches marked by the display of speaker-state cues
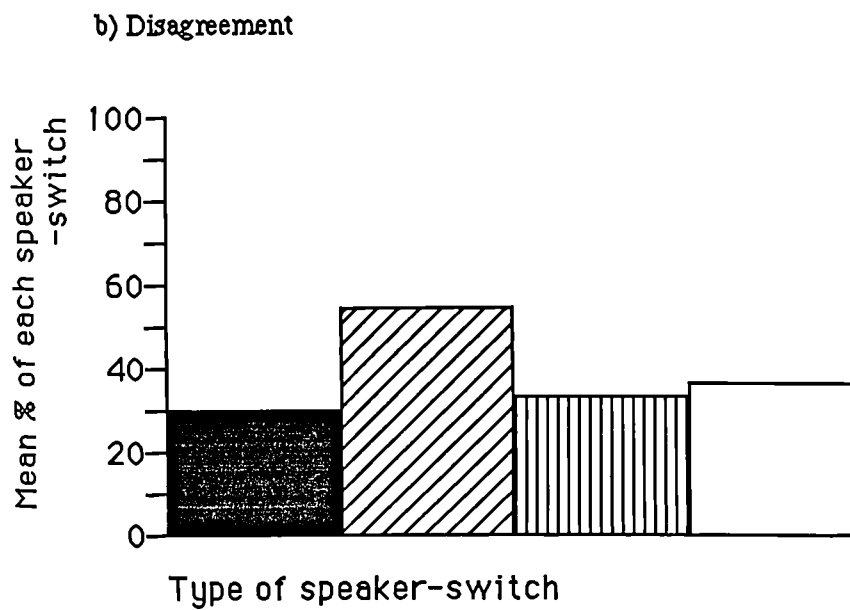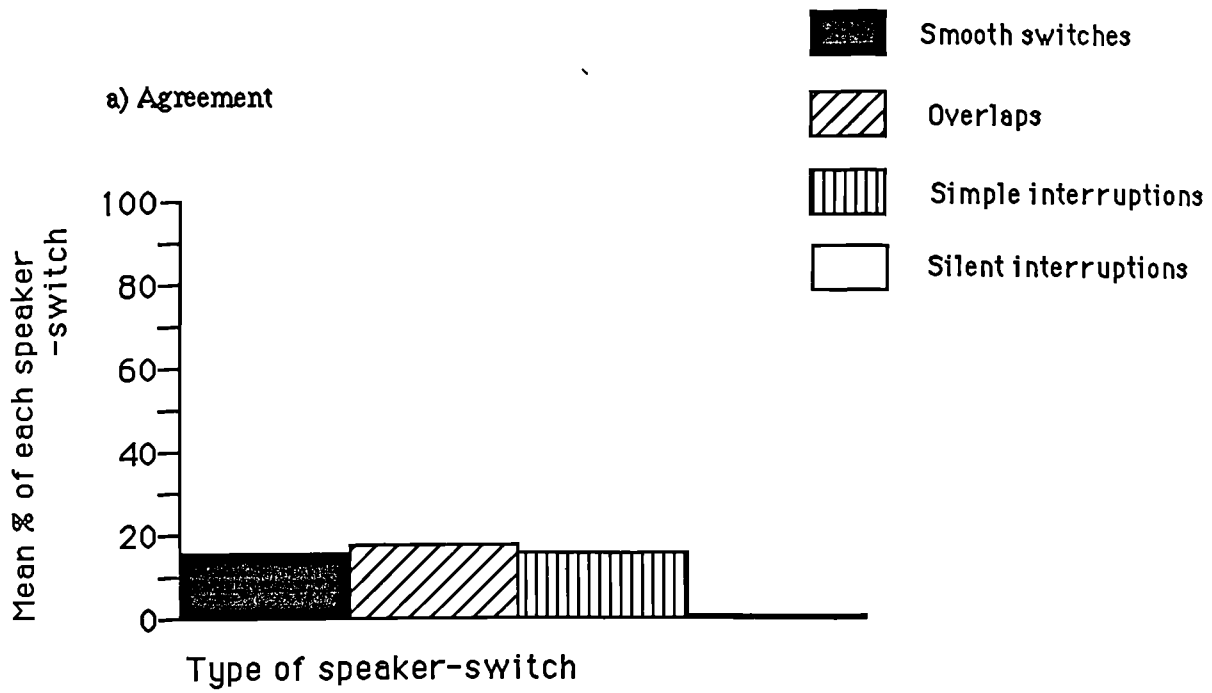
From Figure 4.7 it can be seen that in disagreement a greater proportion of turn beginings were marked by speaker-state cues than in agreement. Statistical analysis showed that in the case of overlaps this difference was significant (Wilcoxon Test, T=0, n=6, p<0.05) but in the case of smooth speaker-switches and simple interruptions this difference just failed to reach significance (for both Wilcoxon Tests T=1, n=6, p<0.07).

It should be noted that on most occasions these displays involved single cues rather than two cues (see appendix IV, Table B.13a&b). There was no significant difference in either condition in the frequency with which these single cue displays involved either of the two constituent cues (none of the Wilcoxon Tests were significant).

4.2.3. Discussion

The results of this present study provide support for Duncan and Fiskes claim that smooth speaker-switches occur at locations marked by the display of turn-yielding cues and, in contrast, interruptions are more likely to be associated with locations where no turn-yielding cues are displayed. Importantly, it was also found that in line with Beattie's study (1981a), special cue combinations were important in marking the ends of speaker turns; there was clearly not a linear relationship between the number of turn-yielding cues conjointly displayed and the probability of an auditors turn-taking attempt as Duncan and Fiske (1977, 1985) suggested. It was found that in the case of some individuals this combination involved drawl and gesture termination. However, in most cases the two cues of grammatical completion and intonation change were used to regulate speaker turns (see also Roth, 1981). This particular cue combination was found to mark the termination points of overlaps but, in contrast to Roth's (1981) findings, only on a few occasions did it mark the initiation point. One may speculate that whether or not turn-yielding cues are ascribed with any predictive role depends on the type of overlap that occurs. Thus it could be the case that in Roth's sample more overlaps resulted from a speaker adding or tagging on a further clause or phrase than in this corpus. Yet this result begs the question what factors were used in this corpus to predict an up and coming completion point? This fundamental issue will be addressed in chapter 7.

Importantly it was found that the majority of turn-medial utterances were marked by the display of at least one turn-yielding cue. As predicted, it was found that very few turn-medial utterances were distinguished by the maintenance of gesture and or shift in gaze, the two nonverbal behaviours which Duncan and Fiske claimed served to preserve the speaker turn. It was found, however, that in the case of some

individuals their turn-final and turn-medial utterances were distinguished by the differential and exclusive use of drawl at one of these locations. Yet it must be acknowledged that since none of these individuals used it very frequently it is not certain that participants actually regarded it in a fixed manner as either preserving or yielding the turn. Interestingly, it was found that a large proportion of turn-final utterances were distinguished from the turn-medial utterance immediately preceding, by the display of at least one turn-yielding cue This suggests that in some cases it was the particular sequential pattern of 'cues' that was important. In other words, the significance attributed to the 'turn-yielding cues' is not fixed but may vary according to the local context of the conversation (Wilson et al., 1984) However, this does not explicate the way in which a speaker indicates how a particular cue should be interpreted at any given point in the conversation. One possible but partial explanation is to assume that participants do not in fact treat grammatical completion as a turn-yielding cue. Thus turn-medial utterances that were marked by this 'cue' alone would be readily distinguished from a turn-final utterance that was marked by more turn-yielding cues. Nevertheless, this would not explain how speakers-switches are actualised at appropriate locations when the turn-final utterance is marked in the same manner as the preceding turn-medial utterance. In short, Duncan and Fiske's model of turn-taking does not give an adequate account of how a speaker switch is actualised at a particular location in this sample of conversation. This result suggests that either the turn-taking cues Duncan and Fiske identified do not have a fixed meaning in relation to turn-taking or there are other cues (fixed or flexible) that have yet to be identified, but which are important in the regulation of conversation. The next chapter will address the question of whether in the verbal channel there are other discrete but effective turn-taking cues. Clearly if flexible cues exist then it follows that investigation into the role contextual factors play in turn regulation is urgently required.

It is important to note that this study found that the differences in the structural organisation of agreement and disagreement did not effect the way turn-final utterances were marked, although it did have some effect on the way the middle of turns were marked. This is a rather surprising result because it suggests that participants do not generally modify the way they mark their turns in response to, for example, the increased likelihood of interruption. However, it was found that the type of conversation did affect the use of speaker-state cues, which as predicted were used more frequently in disagreement than in agreement. Nevertheless, even in disagreement the speaker-state cue was not used particularly frequently compared with the level Duncan and Fiskes observed and a substantial number of smooth exchanges occurred in the absence of this cue. This poses a problem for the consistency of Duncan and Fiskes model since they claimed that the speaker-state cue played an

important role in co-ordinating a smooth exchange of speaker turns. However, one may speculate that the differences between the two studies were attributable to the differing aims of the participants involved. For instance, Duncan and Fiske (1985, p49.) noted that the participants in their study were unacquainted and seemed anxious to avoid any embarrassment that may have resulted from lapses in the conversation. Therefore it could be the case that the second speaker used the speaker-state cue, not to co-ordinate a smooth exchange but purely to indicate their intention to respond and thus avoid any lapse. In contrast, the close friends, whose conversations formed the basis of this study, may not have needed such assurances. Thus they may have used the speaker-state cue on occasions when there was likely to be competition for the next speaker turn in an effort to make clear their intention to take the next turn. In short, it seems that the speaker-state cue does not play a primary role in co-ordinating the smooth exchange of turns, it may, however, be used simply as a means by which a participant can communicate their intention to speak.

4.3. Directory enquiry calls

In this next section data will be presented on the display of turn-yielding cues in directory enquiry calls.

4.3.1. Method

For this study one conversation from each of the 15 operators was randomly selected for analysis. In this sample there were 213 speaker-switches; 181 were smooth speaker-switches, 23 were overlaps and 9 were interruptions. In addition there were 24 turn-medial utterances, which preceded a smooth speaker-switch. All speaker-switches and turn-medial utterances were examined for the presence of any of the five turn-yielding cues (which were listed earlier in this chapter in section 4.2.1.).

It should be noted that the broadening of the definition of grammatical completion resulted in 7 of the operators smooth speaker-switches and 38 of the subscribers smooth speaker-switches, being re-classified as grammatically complete.

Reliability

Inter-observer reliability between two judges in identifying the turn-yielding cues at turn-final utterances was 83% and at turn-medial utterances 87%. The test re-test reliability was 93% and 90%, respectively. The reliability in identifying individual turn-yielding cues ranged from 81% in the case of drawl to 98% in the case of

grammatical completion. Reliability was calculated on the basis of 30 speaker-switches and 20 turn-medial utterances.

Analyses of the data

A Wilcoxon Matched-Pairs Signed-Ranks Test was used to compare the frequency with which operators and subscribers smooth speaker-switches were preceded by the display of any turn-yielding cues. This analysis was based on the frequency of speaker-switches that implicated any turn-yielding cues, expressed as a percentage of the total number of smooth speaker-switches in that group.

4.3.2. Results

Turn-final utterances

Figure 4.8 shows the mean percentage of turn-yielding cues conjointly displayed at smooth speaker-switches by operators and by subscribers. It can be seen that for both operators and subscribers whilst a substantial number (in the region of 40%) of smooth speaker-switches were preceded by single-cue displays, the highest conjoint frequency of turn-yielding cues was two. It was found that there was no significant difference between operators and subscribers in the relative frequency with which smooth speaker-switches were marked by turn-yielding cues (as opposed to zero display; Wilcoxon Test, $Z=0.5$, $n=15$, n.s.).

However, from Figure 4.9 it can be seen that there were differences in the frequency with which operators and subscribers used particular turn-yielding cues. In the case of operators, intonation was the most frequently used turn-yielding cue. This cue was implicated in 54% of single-cue displays. In contrast, grammatical completion and drawl were implicated in 16% and 31% of single-cue displays, respectively. Of those smooth speaker-switches that followed the display of two cues by the operator, 84% implicated a change intonation accompanied by grammatical completion and 16% involved the latter cue and drawl. In the case of subscribers the most frequently used turn-yielding cue was grammatical completion. This particular cue was implicated in 54% of all single-cue displays. A change in intonation and drawl, in contrast, were implicated in 32% and 14% of single-cue displays, respectively. Of the subscribers smooth speaker-switches that were marked by two-cue displays, 74% involved grammatical completion and a change in intonation and 23% involved grammatical completion and drawl. In other words, by investigating the use of the turn-yielding behaviours identified by Duncan and Fiske it was found that for single-cue displays whereas in the case of operators intonation was the most frequently used cue, in the

Figure 4.8: Mean percentage of turn-yielding cues conjointly displayed during directory enquiry calls

a) Operators
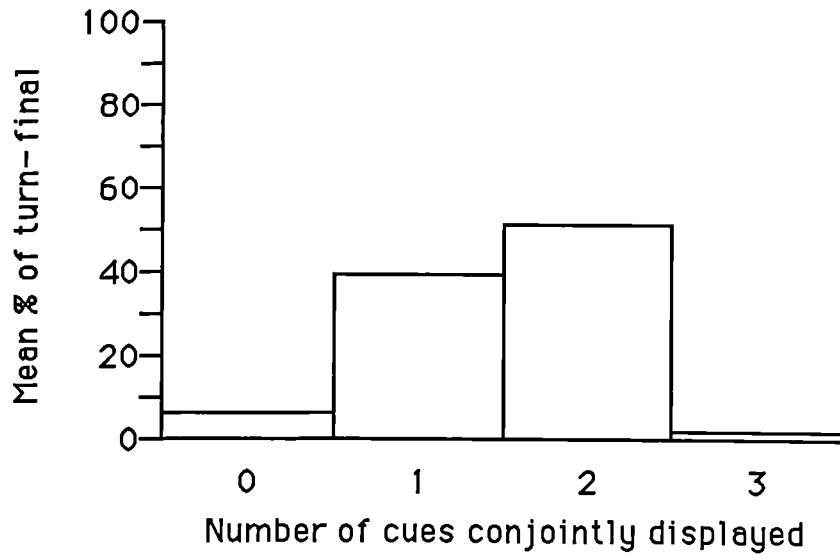
b) Subscribers
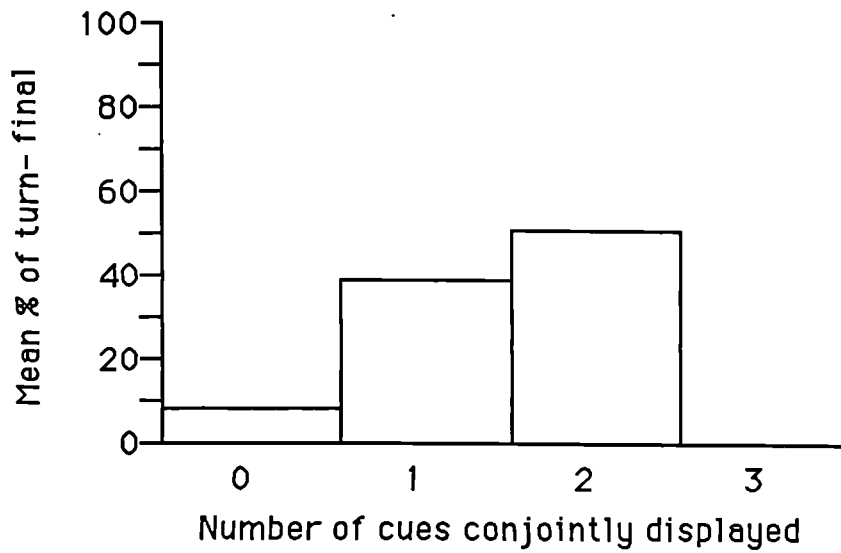
Figure 4.9: Mean percentage of smooth speaker-switches marked by individual turn-yielding cues during directory enquiry calls
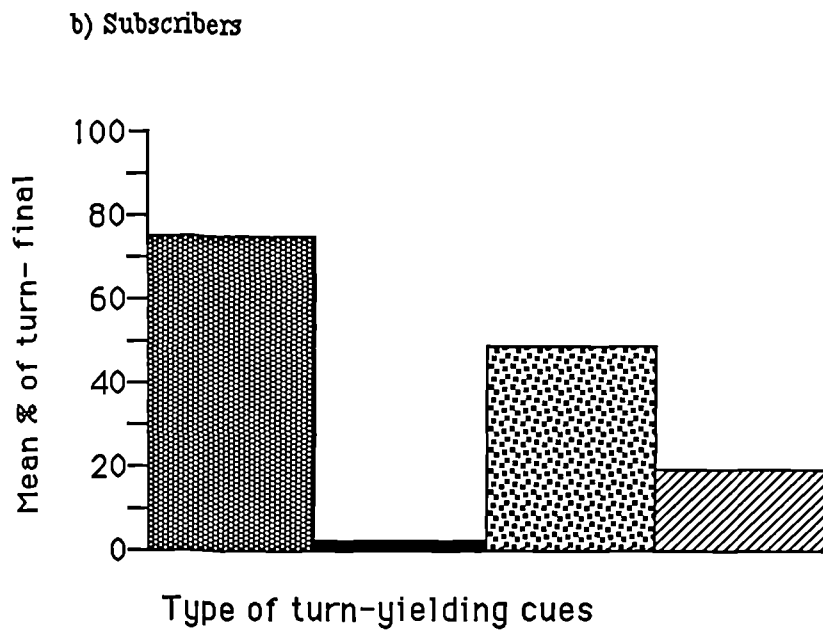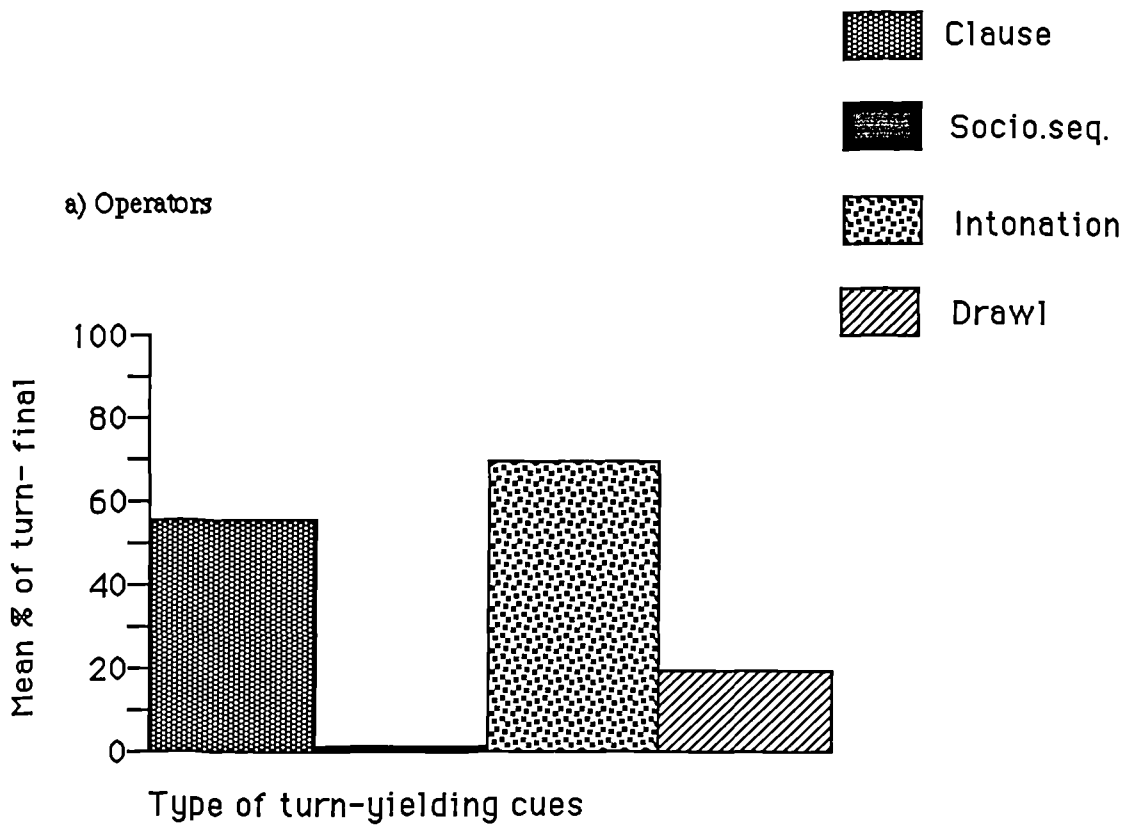
case of subscribers it was grammatical completion However, for those turn-final utterances that were marked by two-cue displays the most frequently used combination for both operator and subscribers involved grammatical completion accompanied by intonation change.

Nonfluencies occurred infrequently in this sample of calls. Yet, since Duncan and Fiske claim that such occurrences represent a violation of the turn system, it is necessary to note whether or not these nonfluencies occurred in conjunction with any turn-yielding cues. With respect to overlaps it was found that operators talk was overlapped on 11 occasions and subscribers on 10 occasions. Whilst the initiation points of these overlaps did not implicate any turn-yielding, the termination points were marked by the display of at least one turn-yielding cue. In the case of the operators, 3 were marked by single-cue displays and 8 by two-cue displays. In the case of subscribers, 5 were marked by single-cue displays and 5 by two-cue displays. For overlaps, all single-cue displays involved grammatical completion and all two-cue displays involved grammatical completion accompanied by a change in intonation. Simple interruptions only occurred in total five times and on all occasions it was the subscriber who was interrupted by the operator and not vice-versa. Turn-yielding cues (that is grammatical completion and intonation change) were only implicated at the initiation point of one simple interruption. On no occasions were turn-yielding cues implicated at the termination point of the simple interruption. Silent interruptions occurred in total four times; 2 operators and 2 subscribers were interrupted, but no turn-yielding cues were implicated.

Turn-medial utterances

Only 24 turn-medial utterances, preceding a smooth speaker-switch, were observed in this sample of directory enquiry calls. Although obviously it is not possible to draw any firm conclusions using such data, it is still worth noting the incidence of turn-yielding cues as this will enable us at least to see if there are any striking differences in the way turn-final and turn-medial utterances are marked. Table 4.3a&b shows the frequency with which turn-yielding cues were conjointly displayed and the particular cues that were implicated in these displays. It can be seen that whilst operators tended to use single and two-cue displays at turn-medial locations, subscribers tended to use only the former. When each turn-medial utterance was compared with its respective turn-final utterance it was found that in the case of operators, 6 were marked differently from their corresponding turn-final utterance and in the case of subscribers, 7 were marked differently.

Table 4.3a: Relationship between number of turn-yielding cues conjointly displayed and turn-medial utterances during directory enquiry calls

Number of turn-yielding cues conjointly displayed	Frequency of smooth speaker switches	
	Operator-subscriber	Subscriber-operator
0	2	2
1	5	9
2	5	1
Total	12	12

Table 4.3b: Frequency of individual turn-yielding cues displayed at turn-medial utterances during directory enquiry calls

Turn-yielding cues	Frequency of smooth speaker switches	
	Operator-subscriber	Subscriber-operator
Clause	8	2
Socio.seq.	0	1
Intonation	6	6
Drawl	1	2

4.3.3. Discussion

In accordance with Duncan and Fiskes model, in this present study it was found that the majority of operators and subscribers smooth speaker-switches were marked by at least one turn-yielding cues. Interestingly it was found that the display of just one turn-yielding cue implicated a substantial number of smooth speaker-switches (viz.40%). This result stands in sharp contrast to other studies, which have found that only a small proportion of smooth speaker-switches were marked by single-cue displays; the proportion ranged from 13% in Duncan's original study (1972) to 4% in Roth's (1981) study. Importantly, the disparity between this current study and previous research, could reflect a fundamental difference in the way turn-taking is managed during directory-enquiry calls, as opposed to other more casual conversations. In particular it could be the case that in directory enquiry calls verbal content plays a more important role in turn management. For instance, it has been noted that directory enquiry calls are highly structured, constrained conversations, which typically follow a particular format; they are by nature guided not only by strict question/answer sequences but by the participants aim to communicate all the requisite information as efficiently as possible. These conversations are thus distinct from other more casual or complex conversations in that the participants are operating with a reasonably clear notion of what constitutes a complete speaker turn (albeit a question or an answer). Thus, for example, a subscriber is likely to reply to an operators standard question whether or not it is additionally marked by a change in intonation and is unlikely to respond if, having given all the requisite information, the operator asks them to wait while they look for the number. Similarly, if an operator has asked for the name of the people, they are likely to respond if the subscriber answers 'Jones' but are not likely to respond if the subscriber simply says 'It's a hotel' (call 7) - they will wait for its name. One may go on to speculate that two turn-yielding cues are used at locations where there could be some ambiguity surrounding the completion point. For instance, if the subscribers response to the request for the name of the people involves the name of a company, which involves a string of words and letters (as opposed to an initial and surname) the subscriber may use intonation, in addition to ellipitical grammatical completion, to indicate the completion point. In other words, in addition to the use of turn-yielding cues, it seems to be the case that in directory enquiry calls the participants knowledge of how these calls proceed and what is actually said (the verbal content) plays an important role in the management of conversation.

4.4. Travel enquiry calls

In this next section data will be presented on the use of turn-yielding cues during travel enquiry calls.

4.4.1. Method

The twelve conversations from each of the three principle operators (which were classified in chapter 3) were used as the basis of this study. In this sample there were 678 speaker-switches; 512 were smooth speaker-switches, 130 were overlaps and 36 were interruptions. In addition, there were 154 turn-medial utterances preceding smooth speaker-switches. All speaker-switches and turn-medial utterances were examined for the presence of any of the five turn-yielding cues (which were listed earlier in this chapter in section 4.2.1.).

It should be noted that the broadening of the definition of grammatical completion resulted in some smooth speaker-switches and overlaps being re-classified. For operators 23 smooth speaker-switches and the termination points of 5 overlaps were re-classified as grammatically complete and for subscribers 34 smooth speaker-switches and the termination point of 8 overlaps were re-classified.

Reliability

Inter-observer reliability between two judges in identifying the turn-yielding cues at turn-final utterances was 85% and at turn-medial utterances 88%. The test re-test reliability was 90% and 91%, respectively. The reliability in identifying individual turn-yielding cues ranged from 85% in the case of drawl to 97% in the case of grammatical completion. Reliability was calculated on the basis of 40 speaker-switches and 30 turn-medial utterances.

Analyses of the data

To investigate whether operators and subscribers differed in their use of turn-yielding cues a Kruskal-Wallis Test was used and to determine if operators differed from their respective subscribers in their use of turn-yielding cues a Wilcoxon Matched-Pairs Signed-Ranks Test was used. As with the face-to-face conversations, this analysis was based on the percentage of the total number of smooth speaker-switches in each group that were marked by turn-yielding cues.

4.4.2. Results

<u>Turn-final utterances</u>

The initial stage of this analysis will focus on the incidence of turn-yielding cues in relation to smooth speaker-switches. From Table 4.4 it can be seen that for operators and subscribers whilst approximately 30% of smooth speaker-switches occurred in the presence of one turn-yielding cue, the majority occurred in the presence of two-cue displays. It was found that there was no significant difference between operators or between subscribers in the proportion of smooth speaker-switches marked by the display of turn-yielding cues (as opposed to zero display; Kruskal-Wallis Test, $H=1.15$ and 1.59, respectively, df=2, n.s.; see Table 4.4). Furthermore, there was no significant difference between each operator and their respective subscribers in the use of turn-yielding cues at these locations (all three Wilcoxon Tests were not significant).

The next stage of the analysis was directed towards establishing which of Duncan and Fiskes turn-yielding cues were associated with smooth speaker-switches in each session of travel enquiry calls. Table 4.5. shows the mean percentage of smooth speaker-switches that were marked by the display of individual turn-yielding cues (see appendix IV, Tables B.16 and B.17. for the data for each call). At this juncture it is worth pointing out that overall operators and subscribers differ in their use of drawl. (In this particular corpus syllable lengthening was typically exaggerated compared with the drawl observed in the face-to-face conversations.) However, it was also found that there were differences in the types of cues used and the frequency with which particular combinations were employed:

1) Session A -   For operator A of those smooth speaker-switches that were marked by one turn-yielding cue, 40% involved grammatical completion, 40% intonation change and 20% drawl.   Of those smooth speaker-switches that were marked by two-cue displays all involved grammatical completion, 88% intonation change and 12% drawl. For subscribers, single-cue displays involved either grammatical completion or intonation change and 96% of two-cue displays involved the conjoint display of both of these cues, the remaining 4% involved grammatical completion and drawl.

2) Session B - For operator B and his subscribers it was found that of those smooth speaker-switches marked by one turn-yielding cue between 40-45% involved grammatical completion, 40-45% involved change in intonation, and 13% involved drawl. The vast majority of smooth speaker-switches

Table 4.4: Relationship between mean percentage of turn-yielding cues conjointly displayed and smooth speaker-switches during travel enquiry calls

| Number of turn-yielding cues conjointly displayed | Frequency of smooth speaker-switches at junctures with different number of cues displayed | | |
| | Operator Session | | |
	A	B	C
Operator-subscriber			
0	9.7	6.5	6.4
1	30.2	30.2	35.7
2	53.9	54.3	49.2
3	6.2	9.0	8.7
Subscriber-operator			
0	9.1	10.9	7.8
1	30.4	30.8	30.5
2	59.3	55.4	56.6
3	1.2	2.9	5.1

Table 4.5: Mean percentage of individual turn-yielding cues displayed at smooth speaker-switches during travel enquiry calls

Turn yielding cues	Frequency of smooth speaker-switches marked by each cue Operator Session		
	A	B	C
Operator-subscriber			
Clause	71.8	78.2	51.7
Intonation	64.7	59.1	82.1
Drawl	20.2	28.3	26.6
Subscriber-operator			
Clause	74.5	77.5	60.1
Intonation	72.7	66.4	84.3
Drawl	5.3	8.1	15.8

marked by two-cues involved grammatical completion accompanied by intonation change; for operators and subscribers only 15% and 3%, respectively of smooth speaker-switches were preceded by grammatical completion accompanied by drawl.

3) Session C - For operator C of those smooth speaker-switches marked by single-cue displays, 40% involved grammatical completion and 60% intonation change. The majority of two-cue displays involved grammatical completion and intonation change, however, 25% involved grammatical completion accompanied by drawl. For subscribers it was found that 76% of single-cue displays involved intonation change and the remaining 24% grammatical completion. Of those smooth speaker-switches that were marked by two-cue displays, 82% involved grammatical completion and intonation and the remaining 18% involved drawl.

In other words, in terms of Duncan and Fiskes' model, it was found that of those smooth speaker-switches marked by single-cue displays the majority involved either grammatical completion or intonation change. Drawl was, however, used on some occasions at these locations by operators A and B and the subscribers in session B. For all operators and the subscribers in sessions A and C, whilst approximately 15% of two-cue displays involved grammatical completion and drawl, the majority involved grammatical completion and intonation change. In the case of the subscribers in session B all two-cue displays involved grammatical completion and intonation change (with the exception of one instance).

The next stage of the analyses was directed towards establishing whether Duncan and Fiskes model could account for the nonfluencies that occurred. It should be noted, however, that of the non-fluencies observed it is necessary to be cautious in the analysis of turn-yielding since the use of overlaps was not evenly distributed across all calls and interruptions occurred relatively infrequently. For overlaps it was found that across all sessions for operators and subscribers whilst the vast majority of overlaps (125/130) were not initiated in the presence of any turn-yielding cues, all termination points were marked by the display of at least one turn-yielding cue (with the exception of two instances). Approximately 30% of these termination points were marked by one-cue displays; all involved grammatical completion. The highest conjoint frequency of turn-yielding cues, however, was two cues - grammatical completion and intonation change. For interruptions it was found that of the 31 initiated whilst the subscriber was talking, 5 implicated grammatical

completion. Only two termination implicated any turn-yielding cues[11]. Of the 5 interruptions initiated whilst the operator was talking, only one location implicated any turn-yielding cues (in this case grammatical completion). None of the termination points implicated any turn-yielding cues.

Turn-medial utterances

It was found that across all three sessions there was an average of 4 turn-medial utterances per call. However, there was a large variance in the number of turn-medial utterances (σ^2=13.4, see appendix IV, Tables B.20&21). From Table 4.6 it can be seen that the highest conjoint frequency of turn-yielding cues was one. Typically this involved grammatical completion (see Table 4.7).

Turn-final/turn-medial utterances

It was found that turn-final and turn-medial utterances differed in the proportion marked by zero, one and two turn-yielding cues. When the turn-medial utterances, which immediately preceded a smooth speaker-switch, were compared with their corresponding turn-final utterance, it was found that in the case of operator A, 80% of turn-medial utterances were marked by less turn-yielding cues than their respective turn-final utterance. In contrast, for operators B and C, 48% and 43% of turn-medial utterances, respectively, were marked by less turn-yielding cues than their respective turn-final utterance. For subscribers in session A, B and C the figures were 64%, 61% and 75%.

4.4.3. Discussion

In this present study it was found that for operators and subscribers whilst the majority of smooth speaker-switches were marked by the display of two turn-yielding cue, interruptions tended to occur at locations where there were no turn-yielding cues. This result thus offers broad support for Duncan and Fiske's claim that these behaviours play a role in exacting a smooth exchange but clearly also corroborates Beattie's (1981a) proposal that it is combinations of these cues that are important in marking the ends of speaker turns. However, it should be noted that, as in directory enquiry calls, a notable proportion of smooth speaker-switches were preceded by just single-cue displays. This suggests that perhaps the turn-yielding cues Duncan and

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11. On one of these occasions grammatical completion occurred in isolation and on the second occasion it was accompanied by drawl.

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Table 4.6: Relationship between the overall percentage of turn-yielding cues conjointly displayed and turn-medial utterances during travel enquiry calls

Number of turn-yielding cues conjointly displayed	Frequency of turn-medial utterances at junctures with different number of cues displayed		
	Operator Session		
	A	B	C
Operator-subscriber			
0	33.3	9.7	7.3
1	44.4	*58.1*	*56.1*
2	22.2	29.0	36.6
3	0.0	3.2	0.0
Subscriber-operator			
0	34.8	29.2	17.6
1	47.8	41.6	70.6
2	17.4	25.0	11.8
3	0.0	4.3	0.0

.

Table 4.7: Overall percentage of individual turn-yielding cues displayed at turn-medial utterances during travel enquiry calls

| Turn yielding cues | Frequency of turn-medial utterances marked by each cue Operator Session | | |
	A	B	C
Operator-subscriber			
Clause	50.0	77.4	65.9
Intonation	16.7	25.8	43.9
Drawl	20.0	22.6	19.5
Subscriber-operator			
Clause	43.5	58.3	68.8
Intonation	13.0	33.3	31.3
Drawl	26.1	12.5	0.0

Fiske identified are not of paramount importance in the turn-taking procedure in these conversations. There exists the possibility that other effective cues may be carried in the verbal channel and serve to demarcate completion points. It is clearly necessary to determine whether such information functions in a fixed or flexible manner with respect to the turn-taking process. Since travel enquiry calls are fairly structured at certain stages (c.f. chapter 3), it is possible that in these sections of a call verbal content may provide information about the course of a speaking turn. These issues will be investigated in chapter 6.

Importantly, it was also found that although the initiation points of overlaps tended not to implicate any turn-yielding cues, the majority of termination points were marked by the display of at least one turn-yielding cue. Thus it can be seen that, unlike Roth's (1981) sample of conversation, in travel enquiry calls turn-yielding cues are not used to predict completion points and that the factors used by participants to predict the end of a speaker turn have yet to be determined.

When the operators use of individual turn-yielding cues was compared with subscribers it was found that most notably they differed in the frequency with which drawl was used. This difference, however, makes sense if one thinks about the task structure of such calls; specifically the operator may extend the syllables of certain words to help emphasize some important travel information. It was also noted that there were some differences between operators and subscribers in the types of cues used in single-cue displays and the specific combinations of two-cue displays. Interestingly, however, it was found that aside from these relatively minor differences, operators and subscribers did not differ fundamentally in the way they mark the ends of speaker turns - at least in terms of the turn-taking behaviours Duncan and Fiskes identified. Thus the model can not offer an explanation as to why operators A and C differed from their subscribers in the types of turn exchange they used (recall the results of chapter 3).

When turn-final and turn-medial utterances were compared it was found that in the case of operator A and all the subscribers the majority of turn-final utterances were distinguished from turn-medial locations by the use of more turn-yielding cues. This was not, however, the case for operators B and C. From the results of section 3.3. in chapter 3 it is known that in session A there were less butting-in interruptions than in any of the other two sessions. However, there is no convincing evidence that the differential use of these cues at turn-final and turn-medial locations actually aided the smooth management of conversation. For instance, in sessions B and C, although the operators and subscribers differed in the frequency with which they differentially marked their turn-final and turn-medial utterances, they did not differ in the frequency

with which their talk was interrupted. In addition, despite the fact that operator A was distinguished from the other two operators by the differential use of turn-yielding cues at turn-medial and turn-final locations, these differences emerged at locations that were in fact free from interruption. Again this set of results points to the possibility that there could be other verbal cues at these locations but also, since these conversations are structured to some degree, it could be the case that verbal content may interact with those turn-yielding cues present to indicate to the participant the appropriate location to respond. The importance of local vocal features and the verbal content in these conversations will be investigated in chapter 6.

In conclusion, it has been seen that this series of studies has provided some support for Duncan and Fiskes' model of turn-taking - the majority of smooth speaker-switches were associated with the display of turn-yielding cues whereas interruptions tended to occur at locations where no turn-yielding cues were displayed. However, as Beattie (1981a) suggested, it seems that across all the conversations it was the combination of turn-yielding cues that was important in mediating smooth speaker-switches, rather than the linear model Duncan and Fiske suggested. However, it was found that there were two important events for which the model could offer no consistent explanation. Firstly, it was found that in all the conversations the incidence of turn-yielding cues at turn-final and turn-medial locations did not explain how one particular location was used for the exchange of speaker turns and not another. In the case of the face-to-face conversations and the travel enquiry calls it was suggested that either other cues may exist or Duncan and Fiske's turn-taking cues do not have a fixed function with respect to the speaker turn. However, it was also suggested that in the case of the telephone conversations owing to the structured nature of the task, verbal content may also play a role in the synchronisation of speaker turns. Secondly, it was found that the model could not explain how participants could predict a completion point and come in just overlapping the last part of the first speakers talk. The investigation of these two issues is clearly crucial in furthering our understanding of the turn-taking mechanism and they will be addressed in the succeeding chapters.

Note.

1. This analysis was carried out using the Capstrum technique (see Noll, 1967). However, to carry out such analysis the audio recordings have to be of exceptional quality and are usually made using a directional microphone placed in front of the mouth of the speaker. In this case the original recordings were made on video tapes,

which generally do not have a sufficiently good sound track to carry out such analyses. However, in an effort to get some more detailed information about the precise nature of the pitch changes associated with turn-final utterances (and the sustaining of pitch at turn-medial utterances), the Capstrum technique was used. In the event it was only possible to make accurate traces of the frequency in 1 turn-final utterance and 6 turn-medial utterances. It should also be noted that because telephone lines only transmit between 300Hz. to 3.4 KHz. it was not possible to analyse the frequency of the turn-final and turn-medial utterances in the corpora of telephone conversations.

Chapter 5

On Judging the Ends of Speaker Turns in Face-to-face Conversation[1]

5.1. Introduction

In the last chapter it was found that Duncan and Fiskes model could not explain how turn-final and turn-medial utterances were distinguished since these locations were often associated with the same set of 'cues'. It was suggested that perhaps either the turn-taking cues Duncan and Fiske identified did not have a fixed function or other cues existed in the verbal channel. Wilson et al., (1984) suggested that 'cues' or events in conversation do not have a fixed function and that inferences concerning their meaning with respect to preserving or yielding the turn depend on the local context of the conversation. The aim of this chapter is determine whether there are indeed independently identifiable cues in the verbal channel, which serve to distinguish turn-final and turn-medial utterances.

The basic methodology employed by Duncan (1972) and later by Duncan and Fiske (1977, 1985) in their naturalistic studies of conversation has come in for some criticism. (You will recall that these criticisms were discussed in some detail in chapter 2). The method involved simply correlating the features associated with the end of a turn with the subsequent response of the listener, whether it be an immediate and smooth change in speaker role, a change in speaker role involving interruption, or no response at all. Cutler and Pearson (1985) have argued that because the speech was transcribed with full reference to the discourse context there was a distinct possibility that the record of the prosodic features of the utterance was affected by the syntax and content of the utterance, as well as by its known position in the turn (Cutler and Pearson, 1985). They also point out that a fall in pitch, decrease in amplitude and segment lengthening (or drawl) is characteristic of the ends of all utterances in speech and not just the ends of turns. Oller (1973) for example, found that a given word was uttered with longer duration in phrase final than in non-phrase final position, but found no evidence that this lengthening was even greater in turn-final utterances. Cutler and Pearson have also noted that Duncan did not provide any metric for the (non-defined) drawl feature to determine the relationship between the expected and observed turn-final lengthening. They

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1. See also Stephens and Beattie, 1986

conclude that Duncan must have based his judgements about the presence of drawl on a subjective impression of whether there was any syllable lengthening. In the study reported in the last chapter it was noted that to guard against any bias that may have occurred from the authors interpretation of the term drawl, a selected sample of judgements were checked against those of an independent judge, who was not only unfamiliar with Duncan's model but also did not know whether any particular utterance was selected from turn-final or turn-medial position. This investigation revealed that in the face-to-face conversations drawl was used consistently and exclusively by some participants at some turn-final locations. However, it was not possible to determine from this information whether drawl was perceived as important in marking the ends of turns, as Duncan and Fiske originally suggested. An additional aim of this study therefore is to stringently test whether drawl can function in a fixed manner in guiding judgements of completion this finding using a different methodology (to be described in due course).

An endeavour to employ a somewhat more rigorous methodology than Duncan was made by Beattie, Cutler and Pearson (1982) who carried out a judgement study to see if listeners could discriminate turn-final from turn-medial utterances. These utterances came from one particular context (political interviews) and, moreover, from the speech of one particular speaker (Mrs Thatcher). They discovered that subjects could discriminate turn-final and turn-medial utterances when they were presented on video (sound and vision), in audio mode or on video with the sound turned down (vision only) but not when a typescript of the utterances was presented to them. In other words, subjects could not discriminate turn-final from turn-medial utterances on the basis of the meaning or the syntax of the utterance (present in the typescript) at least not when presented in isolation but could when the accompanying prosodic and paralinguistic behaviour was available. They could also make this distinction on the basis of the nonverbal behaviour (present in the vision-only presentation). Beattie et al. subsequently transcribed the prosodic characteristics of a sub-set of these utterances 'blind' (that is without reference to the verbal transcripts of the interviews) and demonstrated that turn-final utterances displayed a larger pitch fall than turn-medial utterances and that this prosodic cue was often accompanied by one nonverbal signal, that is direct eye gaze by the speaker at the listener. This study therefore partly corroborated Duncan's earlier research. It demonstrated that the fall in pitch associated with turn-final utterances is significantly larger than the fall in pitch associated with turn-medial utterances. It did not however systematically investigate the role of drawl in the process. Also, it need hardly be said that the study only involved the analysis of the speech of one individual, in one particular context, and so doubts may be raised about the

generality of subjects' ability to discriminate turn-final and turn-medial utterances presented out of context.

Cutler and Pearson (1985) developed a different experimental technique to establish whether perceptually effective prosodic turn signals do exist. They suggested that the ideal situation in which to investigate this issue would be if the same speaker produced two utterances that were syntactically and semantically identical but that differed in their position within the discourse (i.e. one was turn-final and one was turn-medial). In the absence of naturally occurring material of this type they got speakers to read aloud short dialogues that had been written in such a way that the same utterances occurred in either turn-medial or turn-final position in different versions of certain texts. An example of one of these dialogues is given below:

Speaker 1: Foster was pretty upset that you rejected his design - any particular reason?

Speaker 2: It's simply not good enough, and *that's all I have to say on the subject! I don't see why I have to justify my decisions*

Speaker 1: O.K. - sorry I asked!

The second version of this dialogue was identical except that Speaker 2's turn read:

Speaker 2: *I don't see why I have to justify my decision.* It's simply not good enough, and *that's all I have to say on the subject.*

Both versions of each of the five constructed dialogues were read onto tape by ten native speakers of British English. Then the critical extracts (in italics in the sample dialogue) were edited on to a tape in random order and presented to subjects who had to judge whether it was turn-medial or turn-final. Overall it was found that judges could not make this distinction at above chance level. Importantly, *however, they noted that* subjects judgements were not totally random since the turn-final judgements per utterance ranged from 0% to 100%. Cutler and Pearson then did a prosodic transcription of those utterances consistently judged to be turn-final or turn-medial to see if these extracts had any common features. They found that whilst turn-final judgements were associated with down-stepped contours (i.e. a tonic syllable starting significantly lower than the previous syllable), turn-medial judgements were associated with upstepped contours (i.e. a tonic syllable starting on a higher pitch than the previous syllable).

Cutler and Pearson concluded that the failure of the study to show that judges could distinguish turn-medial and turn-final utterances did not necessarily mean that in real conversation they are not differentiated prosodically. Specifically, they pointed out that the speech in this experiment was not spontaneous and professional

actors, who might have been able to produce a full range of natural prosodic turn signals when reading a written text aloud, were not used. Importantly, however, this study did produce evidence that listeners used particular prosodic features to guide their judgements. In particular, it was found that whilst an upstep in pitch was a good turn holding cue, a down-step in pitch was regarded as a good turn yielding cue. As Cutler and Pearson note 'if listeners have learned to use cues to structure turns, they surely must have learned this by being exposed to cues produced by speakers' (p152). They observed that Duncan and Fiskes hypothesis that any terminal contour other than a sustained mid-level pitch served as a turn-yielding cue clearly did not operate in this experimental setting. This study again ignored the possible role of drawl in the turn-taking process.

Slugoski (1984) explicitly questioned the role of prosody in the turn-taking process. He attempted to compare the relative efficiency of semantic and prosodic elements by asking subjects to indicate as quickly as possible when they judged a series of turns to be complete. Using a similar methodology to Cutler and Pearson he got people to read sample dialogues that were then reedited to yield turns which involved combinations of semantic and intonational elements that were complete (S+, I+, respectively) and incomplete (S-, I-, respectively):

> e.g.
>
> A: Whatever became of that old painting you once had over the mantlepiece? It looked so beautiful hanging there.
>
> B: Oh, didn't you know, it was stolen a little over two months ago. John and I were terribly upset.

plus

> S+ I+ A: Was it insured?
> B: Unfortunately, no (edited out)

or

> S+ I- A: Was it insured?
> B: Unfortunately no.....(edited out)

or

> S- I+ A: What was it worth?
> B: Unfortunately no

or

S- I- A: What was it worth?

B: Unfortunately, no....(edited out)

Slugoski found that the fastest response times were made by subjects to the semantically complete utterance (although this is contrary to the predictions of Walker and Trimboli, 1984, see p271). Importantly, he also found that a complete intonation pattern did not significantly reduce response time. However, Beattie has argued that the problem with this study is that it focussed exclusively on turns that were either extremely predictable (e.g. 'A: Was it insured?, B: Unfortunately, no') or entirely inappropriate ('A: What was it worth, B: Unfortunately, no'; see Ellis and Beattie, 1986; Stephens and Beattie, 1986). It therefore did not investigate the role of intonation in the management of turns that are usually found in ordinary conversation, which fall in between these extremes; that is, turns that are appropriate, relevant, and can be extended beyond phrasal, clausal and sentential boundaries (see Beattie, 1985).

The present investigation was designed to determine if subjects could discriminate turn-final and turn-medial utterances[2], taken from natural conversation when presented in isolation and out of context. It was designed, therefore, to test whether independently identifiable verbal 'cues' exist and thereby the generality of results reported by Beattie et al. (1982). Its second aim was to consider the possible role of drawl in this process. Drawl was a cue given equal weight to the other five turn-yielding signals identified by Duncan in his original investigation but is a 'cue' that most subsequent investigations have ignored. Importantly, the investigation in the last chapter provided some evidence that participants in the face-to-face conversations may use drawl as a turn-yielding cue (see chapter 4, section 4.2.3.). However, given that there are also some problems with Duncan's discussion of drawl (cf. Cutler and Pearson, 1985) one must be reserved about drawing any firm conclusions on the basis of investigation that employed a similar methodology. Thus the aim of this study was to see if naive subjects, judging utterances out of context,

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2. 'Utterance' is a term that is not consistently defined in the literature. Some researchers have used the term to refer to a complete turn (eg Fries, 1952; Harris, 1951; Jaffe and Feldstein, 1970). Others have used it to refer to a component of a turn something like a complete sentence. Thus McLaughlin (1984, p278) defines it as a 'spoken proposition: a unit of speech corresponding to a single sentence or independent clause'. However, I concur with Jefferson (1973) when she says that 'while a complete utterance may be identical with a sentence it need not be, but may indeed consist of a single word'. What? When? How? can from this perspective act as utterances. In this study, however, the investigation is confined to utterances which are sentential in form with the proviso that such sentences need not be entirely grammatical or even grammatically complete.

do perceive drawl in turn-final extracts, and whether this judgement in anyway correlates with the ability to discriminate turn-final and turn-medial utterances. An additional point is that subjects may only be able to perceive drawl in extracts when these extracts are presented in the context of other utterances from the same speaker. This may be necessary to provide subjects with a baseline to detect any apparent syllable elongation. This was tested as well in this study. In order to put the generality question to a severe test it was decided to take extracts from conversations involving both agreement and disagreement. As noted these types of conversations are characterised by very different interactional structures, with disagreement and argument involving a higher proportion of interruptions (see chapter 3, the results of section 3.1 and also Roger, 1984, Trimboli and Walker, 1984).

5.2. Production task

5.2.1. Method

The corpus of face-to-face conversations described in chapter 3 formed the basis of this study. In chapter 3 it was stressed that the experimental design employed to record these conversations was chosen with the aim of capturing verbal interactions that involved substantial agreement and really heated disagreement. It was argued that certain experimental designs may hinder the development of real disagreement (see chapter 3, section 3.2.). However, it should be emphasized that in this study heated disagreement did occur, as the following (not untypical) exchange illustrates:

```
I:    ...you're putting the analogy of a fly is disgusting to me. And you're,
I:    you to say that an actual abortion is the same as an artif[icial abortion.]
M:                                                       [I did -n't say]
M:  th[at at a ]ll. I.
L:     [You did]
I:     [You did]
I:                    You said there was no difference.
M:                                             I was trying to make the
M:  point.
I:      Which was?
M:                  That a foetus [at that stage], the foetus [is kind of so.
L:                               [Doesn't feel]
I:                                                             [You said there
M: [Will you listen! How can you expect me to put my point of v]iew
I: [no was differ-ence between an actual abortion and an artificial]
M:  forward if you keep interru[pting.
L:                             [She's saying [there' s] no di, differ[ence in
I:                                          [You said]              [That's
L:  the] foetus.
I: right]
M:            No I didn't actually. If you listened to what I was actually
M·  saying....
```

You will recall that these recordings were made using a repeated measures design. Of course the problem from the experimenter's point of view is that this natural order involves a confounding of condition with order/time in the experimental setting. Although it was argued that this confound was unlikely to be serious the possibility that it affected the conversations will be explored in detail in the results section.

5.3. Detection task A

5.3.1. Method

Extracts. Twelve speakers (six male and six female) were randomly selected from the corpus. For each speaker six extracts were taken from the agreement condition and six from the disagreement condition. Of these six, three were turn-final utterances, that is at the end of turns and immediately preceding a smooth speaker-switch and three were undisputed turn-medial utterances, that is utterances from the middle of turns. Each extract contained one utterance. The 144 extracts were then edited on to an audio tape, the random order of which was determined by a BASIC program, which was written by the author (see appendix III). The 144 extracts took one hour to present and it was felt that this was close to the limit of most subjects attention span. This was why more extracts from different speakers were not used.

Subjects and design. Ninety psychology undergraduates took part in this experiment. The subjects were allotted to one of the following three conditions; a) judgement of turn completion from audio presentation, b) judgement of turn completion from typescript (which served as a control for content), c) judgement about whether or not drawl was present from audio presentation (a typescript was also provided). There were equal numbers in each condition.

Procedure. There were ten sessions in total (an average of 9 subjects run per session). Subjects in groups A and B were simply asked to judge whether or not the speaker had finished talking, in a forced choice procedure. Subjects in group C, after having read the extract and then heard the audio recording, were asked to judge whether or not drawl was present on i) the final syllable of the final word or on ii) the stressed (emphasized) syllable of the final tone group (which was explained to the subjects).

<u>Analyses of the data</u>

In order that the vast amount of data could be accurately and relatively quickly collated the subjects answers were put onto a main frame computer. A computer programme was written by the author to process this data. To achieve the necessary computing speed, the software was written in the language Fortran 77 programme. A programme listing is presented in appendix V.

To test whether subjects could distinguish turn-final and turn-medial utterances the overall mean percentage of utterances judged by the subjects to be complete or to contain drawl was calculated for each speaker's extracts. A Wilcoxon Matched-Pairs Signed-Ranks Test was used to compare whether the turn-final and turn-medial utterances of each speaker differed significantly in the mean percentage judged to be complete or to contain drawl. A Spearman Rank Correlation Coefficient was used to compare whether completion judgements taken from different sections of the original conversation were correlated and to test whether judgements of completion for turn-final utterances correlated with judgements that drawl was present. All tests were two-tailed, except when specific predictions were made as in Detection Task B.

5.3.2. Results

<u>The turn-final/turn-medial distinction</u>

It can be seen from Table 5.1 that overall turn-final utterances were judged to be complete significantly more frequently than turn-medial utterances in the audio presentation (Wilcoxon Test, $T=5$, $n=12$, $p<0.01$) and in addition it was only turn-medial utterances that were identified at above chance level (Wilcoxon Test, $T=13$, $n=12$, $p<0.05$). It can also be seen from Table 5.1 that judges' ability to discriminate turn-final and turn-medial utterances varied enormously as a function of whose speech the extract was taken from. In the case of the typescript condition there were no significant differences in the percentage of completion judgements for turn-final and turn-medial utterances (Wilcoxon Test, $T=15.5$, $n=11$, n.s.). Thus, overall judges could discriminate turn-final and turn-medial utterances when presented in audio form but not when presented in typescript form. Interestingly, when presented in audio form judges were better at recognising turn-medial utterances than turn-final utterances.

These overall figures, however, obscure some important differences. When the extracts were broken down into those which were taken from the 'agreement' and 'disagreement' conversations certain significant trends were detected (see Table

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Table 5.1: Mean percentage of utterances judged to be complete from the random order presentation of speakers extracts

	Mode of presentation			
Speakers	Audio		Typescript	
	Turn-final	Turn-medial	Turn-final	Turn-medial
1	65.0	47.8	56.7	55.0
2	59.5	36.2	47.2	48.3
3	73.3	60.0	65.5	63.8
4	48.8	36.2	43.3	55.0
5	46.7	42.2	50.5	50.5
6	38.8	32.2	50.5	42.2
7	52.2	35.5	72.8	66.7
8	37.2	46.7	42.2	45.5
9	59.5	42.2	51.7	50.0
10	60.0	53.8	55.0	41.7
11	45.0	41.7	58.3	55.5
12	61.7	41.7	55.5	57.2
Mean	54.0	43.0	54.1	52.6

5.2 and 5.3). In the case of the audio presentation it was found that judges could distinguish turn-final and turn-medial utterances but only when they were taken from the 'disagreement conversations' (for disagreement extracts Wilcoxon Test, T=0, n=12, p<0.01 and for agreement extracts Wilcoxon Test, T=37, n=12, n.s.). In addition, only in the disagreement condition were turn-medial utterances identified at above chance level (Wilcoxon Test, T=3.5, n=12, p<0.01). The mean percentage judgements revealed that in the case of extracts from the 'disagreement conversations' turn-final utterances were judged to be complete 21% more frequently than turn-medial utterances. In the case of extracts from the 'agreement conversations' the mean percentage estimates approximate chance (50.7 for turn-final and 49.8 for turn-medial utterances). In the case of the typescript presentation there were no significant differences in completion judgements for turn-final and turn-medial utterances from either the 'agreement' (Wilcoxon Test, T=35.5, n=12, n.s.) or 'disagreement' conversations (Wilcoxon Test, T=24, n=12, n.s.).

In other words, judges did not seem able to distinguish turn-final and turn-medial utterances on the basis of syntax or semantics (present in the typescript) at least in isolated sentence presentation, but could distinguish those utterances when they *were taken from disagreement and presented in audio form.*

The analysis so far has suggested that judges' ability to discriminate turn-final and turn-medial utterances depends upon the type of conversation from which they were extracted. However, it was pointed out in the methods section (5.1.) that since the disagreement condition always followed the agreement condition there exists the possibility that what in fact was happening was that the original speakers were simply marking the ends of their turns more clearly later in their conversation (rather than in those types of conversation characterised by disagreement). This hypothesis was put to the test by correlating judges' ability to discriminate turn-final and turn-medial utterances taken from each one minute period of the twenty minutes that made up the original conversation. This analysis revealed, however, that there was no significant correlation (Spearman Rank Correlation Coefficient, r=0.25, n=12, n.s.). An additional test was carried out to determine if judges could discriminate turn-final and turn-medial utterances more accurately when there were taken from the second half rather than the first half of both the 'agreement' and 'disagreement' conversations. The test revealed that in fact the converse was true; judges were significantly worse in the second half of each condition. There was a mean reduction in accuracy of 11.5% in the case of agreement and 4.8% in the case of disagreement (χ^2=20.0 and 5.2, p<0.001 and p<0.05, respectively). In other words, no evidence was found that the significant difference between the

Table 5.2: Mean percentage of utterances judged complete the random order audio presentation of speakers extracts

Speakers	Agreement		Disagreement	
	Turn-final	Turn-medial	Turn-final	Turn-medial
1	52.3	44.3	77.7	51.0
2	83.3	45.7	35.7	26.7
3	82.3	84.3	64.3	35.7
4	37.7	49.0	60.0	23.3
5	46.7	55.7	46.7	29.0
6	44.3	34.3	33.3	30.0
7	54.3	35.7	50.0	35.7
8	17.7	49.0	56.7	44.3
9	42.3	66.7	76.7	17.7
10	47.7	52.3	72.3	55.7
11	43.3	40.0	46.7	43.3
12	56.7	41.0	66.7	42.3
Mean	50.7	49.8	57.2	36.2

Table 5.3: Mean percentage of utterances judged complete from the random order typescript presentation of speakers extracts

Speakers	Agreement		Disagreement	
	Turn-final	Turn-medial	Turn-final	Turn-medial
1	40.0	51.0	73.3	59.0
2	61.0	54.3	33.3	42.3
3	70.0	62.3	61.0	65.7
4	44.3	60.0	42.3	50.0
5	47.7	49.0	53.3	52.3
6	52.3	41.0	49.0	43.3
7	69.0	57.7	76.7	75.7
8	26.7	56.7	57.7	34.3
9	36.7	66.7	66.7	33.3
10	59.0	43.3	51.0	40.0
11	67.7	54.3	49.0	56.7
12	45.7	55.7	65.7	59.0
Mean	51.7	54.3	56.9	51.0

agreement and disagreement was in any way attributable to the confound between the conditions and time actually spent holding a conversation in the experimental setting.

Drawl detection

Table 5.4 shows the mean percentage of turn-final and turn-medial utterances judged to display drawl from the random order presentation. Clearly, subjects did not consistently distinguish these utterances in terms of their perception of drawl (Wilcoxon Test, T=33, n=12, n.s.). In the next stage of the analyses the extracts taken from the two types of conversation were considered separately. For the extracts from the 'agreement conversations' the overall mean percentage of turn-final and turn-medial utterances judged to display drawl were 45.6 and 42.4, respectively. The corresponding figures for the 'disagreement' extracts were 47.0 and 53.5 (see Table 5.5). In neither case was there a significant effect (for agreement Wilcoxon Test, T=22.5, n=11, n.s. and for disagreement Wilcoxon Test, T=19, n=12, n.s.).

The role of drawl in the turn-final/turn-medial distinction

The analyses carried out so far have demonstrated a large range of effects. For instance the percentage of turn-final utterances judged to be complete ranged from 37% in the case of speaker 8 to 73% in the case of speaker 3 in audio presentation (see Table 5.1). Similarly, for the extracts presented in random order, drawl was judged to be present 65% of the time in the case of extracts taken from speaker 4 but only 29% in the case of speaker 5 (see Table 5.4). Whilst it has been shown that drawl was not judged to be present significantly more frequently in turn-final utterances than turn-medial utterances, there exists the possiblity that those turn-final utterances from speakers judged to be complete most often were still characterised by the highest levels of perceived drawl. This, however, was not found to be the case - overall there was no significant correlation between the proportion of utterances judged to be complete and the proportion judged to contain drawl. (Spearman Rank Correlation Coefficient, r=0.10, n=12, n.s.). The correlation was also non-significant when the agreement and disagreement extracts were considered separately.

A more complex hypothesis, however, remains to be tested. It has been stated in the introduction to this chapter that there is evidence that syllabic lengthening occurs more generally in phrase final than in non-phrase final utterances (Oller, 1973). However, it may be the case that in these conversations what is important when it

Table 5.4: Mean percentage of utterances judged to display drawl from the random order presentation of speakers extracts

Speakers	Turn-final	Turn-medial
1	47.8	39.5
2	53.3	58.8
3	46.2	37.8
4	65.0	61.7
5	28.8	26.7
6	36.2	33.8
7	53.3	51.2
8	54.5	58.3
9	38.8	54.5
10	46.7	62.2
11	36.7	38.8
12	48.8	51.7
Mean	46.3	47.9

Table 5.5: Mean percentage of utterances judged to display drawl from the random order presentation of speakers extracts

Speakers	Agreement Turn-final	Turn-medial	Disagreement Turn-final	Turn-medial
1	42.3	32.3	53.3	46.7
2	46.7	33.3	60.0	84.3
3	40.0	30.0	52.3	45.7
4	67.7	60.0	62.3	63.3
5	20.0	36.7	37.7	16.7
6	44.3	27.7	27.7	40.0
7	55.7	50.0	51.0	52.3
8	64.3	52.3	44.3	64.3
9	45.7	45.7	32.3	63.3
10	41.0	59.0	52.3	65.7
11	29.0	32.3	44.3	45.7
12	51.1	49.0	46.7	54.3
Mean	45.6	42.4	47.0	53.5

comes to marking the ends of turns is the relative increase in drawl on the final or stressed syllable of the clause at the ends of turns over and above the lengthening of the final or stressed syllable at clauses within the turn. This hypothesis was tested by correlating the proportion of completion judgements in turn-final extracts of any one speaker with turn-final minus turn-medial judgements of the percentage containing drawl from extracts from that speaker. This turn-final minus turn-medial measure is one possible metric of the judged increase in drawl associated with the ends of turns for any given speaker. When this correlation was carried on the overall data it was found to be non-significant (Spearman Rank Correlation Coefficient, r=0.15, n=12, n.s.). It was also not significant when the agreement and disagreement extracts were considered separately.

One problem with this method is that drawl may only be effective in conversation in the context of non-elongated syllables. In Detection Task A a randomised procedure was employed so that extracts from different speakers followed each other. However, what would happen if judges were presented with all the extracts of one speaker one after another thus enabling them to develop some notion of normal syllable length? Here this issue is investigated.

5.4. Detection task B

5.4.1. Method

Extracts. Exactly half of the extracts used in Detection Task A were used in this study. These were randomly selected from six speakers (three female, three male).

Subjects and design. Thirty subjects were recruited from British Telecom's Human Factors subject panel and paid four pounds for their participation in this experiment.

Procedure. There were five sessions in total (an average of six subjects per session). Subjects listened to three presentations of all twelve extracts from each individual speaker in turn. First they listened to all twelve consecutively. After the second presentation they were asked to judge whether or not the speaker had finished talking and after the third they were asked to judge whether or not drawl was present, in each case a forced-choice procedure was used. Then the subjects moved on to all the extracts from the next speaker. The extracts took one hour to present.

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The subjects data were collated using a modified version of the original sorting programme mentioned in section 5.2.1.. The same set of statistical tests that were used in the previous section were carried out on this data.

5.4.2. Results

The turn-final/turn-medial distinction

As before turn-final utterances were judged to be complete more often than turn-medial utterances in the audio presentation, but because of the reduced data this just failed to reach significance (Wilcoxon Test, $T=3$, $n=6$, $p<0.07$; see Table 5.6). When the extracts were broken down into agreement and disagreement conditions, exactly as before, it was found that judges could not distinguish turn-final and turn-medial utterances when they were taken from the agreement condition (Wilcoxon Test, $T=9.5$, $n=6$, n.s.) but that they could when taken from the disagreement condition (Wilcoxon Test, $T=1$, $n=6$, $p<0.05$; see Table 5.7).

Drawl detection

The consecutive presentation of extracts from the same speakers did make a considerable difference to the results obtained. From Table 5.8 it can be seen that overall there was a substantial decrease in the judgements made about the presence of drawl. Under these conditions subjects could consistently distinguish turn-final and turn-medial utterances in terms of the perception of drawl. The overall mean percentage of turn-final and turn-medial utterances judged to display drawl were 32.9 and 27.6, respectively (Wilcoxon Test, $T=1$, $n=6$, $p<0.05$; see Table 5.8). However, when the extracts were broken down into those that came from the agreement and disagreement condition both tests failed to reach significance (for agreement extracts Wilcoxon Test, $T=5$, $n=5$, n.s. and for disagreement extracts Wilcoxon Test, $T=6$, $n=6$, n.s.; see Table 5.9).

Further statistical analyses showed that there was no significant correlation between the proportion of turn-final utterances judged to be complete and the proportion judged to contain drawl (Spearman Rank Correlation Coefficient, $r=-0.27$, $n=6$, n.s.). When the 'agreement' and 'disagreement' extracts were correlated separately it was found that there was also no significant correlation. The more complex correlation was again carried out and was again non-significant both overall and when the agreement and disagreement extracts were considered separately.

Table 5.6: Mean percentage of utterances judged to be complete from the consecutive audio presentation of each speakers extracts

Speakers	Turn-final	Turn-medial
*1(4)	53.3	46.7
2(9)	55.5	39.5
3(11)	34.5	43.8
4(3)	65.5	49.5
5(7)	55.0	35.5
6(1)	56.7	47.8
Mean	53.4	43.8

Table 5.7: Mean percentage of utterances judged to be complete from the consecutive audio presentation of each speakers agreement and disagreement extracts

Speakers	Agreement		Disagreement	
	Turn-final	Turn-medial	Turn-final	Turn-medial
1(4)	46.7	55.7	60.0	37.7
2(9)	51.0	56.7	60.0	22.3
3(11)	33.0	47.3	35.7	40.0
4(3)	85.7	70.0	45.7	29.0
5(7)	43.3	29.0	66.7	42.3
6(1)	37.7	34.3	75.7	61.0
Mean	49.7	48.8	57.3	38.7

* The number in brackets refers to the speakers reference number in detection task A.

Table 5.8: Mean percentage of utterances judged to display drawl from the consecutive audio presentation of each speakers extracts

Speakers	Turn-final	Turn-medial
1(4)	35.0	31.7
2(9)	29.5	26.2
3(11)	27.8	28.8
4(3)	35.0	27.8
5(7)	38.8	27.2
6(1)	31.2	23.8
Mean	32.9	27.6

Table 5.9: Mean percentage of utterances judged to display drawl from the consecutive audio presentation of each speakers agreement and disagreement extracts

| Speakers | Agreement | | Disagreement | |
	Turn-final	Turn-medial	Turn-final	Turn-medial
1(4)	36.7	29.0	33.3	34.3
2(9)	31.0	23.3	27.7	29.0
3(11)	21.0	30.3	34.3	27.7
4(3)	43.3	25.7	26.7	30.0
5(7)	32.3	32.3	45.7	22.3
6(1)	20.0	24.3	45.3	23.3
Mean	30.7	27.5	35.0	27.8

5.5. Discussion

This study convincingly demonstrated that judges could distinguish turn-final and turn-medial utterances taken from natural conversation and when presented out of context, but only when presented in an audio mode. They were not able to do this when presented in typescript form. Thus judges do not seem able to decide whether an utterance constitutes an end of a turn on the basis of the syntax or on the semantics of isolated sentences but can when the additional prosodic and paralinguistic information is available. However, it was also found that, when the samples were broken into categories depending on the type of conversations they were extracted from, subjects could only reliably distinguish turn-final and turn-medial sentences from conversations involving substantial disagreement. This result has two important implications.

The first implication is that the ability of the judges to discriminate turn-final and turn-medial utterances on the basis of verbal, prosodic and paralinguistic information, but only from certain types of conversation, suggests that Duncan's model need some modification. The fact that judges could successfully distinguish turn-final and turn-medial utterances from conversations involving disagreement when the sample of utterances was presented out of context indicates that, in accordance with Duncan and Fiskes theoretical perspective, there are a basic set of turn-taking cues which are identifiable without recourse to the local context of the conversation. However, since it has also been found that in disagreement turn-final and turn-medial utterances were not distinguished in terms of the incidence of turn-yielding cues (recall chapter 4) it suggests that judges were using vocal information that was not identified by Duncan (1972,1974). In other words, it seems that there are discrete, fixed turn-taking cues present in the verbal channel. Clearly further work is needed to identify what discrete verbal features of talk may be important in turn-taking. At this juncture, however, is important to note that judges could not distinguish turn-final and turn-medial utterances taken from agreement and yet in these conversations the interactants did manage to synchronise turns, and indeed they managed to do this highly successfully (from the results in chapter 3 it is known that conversations involving agreement were characterised by a higher proportion of smooth speaker-switches than disagreement). This suggests that visual cues and/or the local context of the conversation may play a more important role in synchronizing speakers-switches in agreement than in disagreement. A pilot study that investigated the possibility that visual information may have been more important in guiding judgements of completion in the case of agreement extracts than in the case of disagreement extracts, however, failed to provide any conclusive evidence that supported this hypothesis (see appendix VI, for further details). It therefore seems

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that in conversations involving agreement the local context is important in providing a back drop against which participants can interpret the various 'cues'. Thus the results of the main study also provide support for the alternative theoretical perspective, which proposes that events in a conversation do not have a fixed role in turn-taking (Wilson et al., 1984). In short, this study provides firm empirical basis for arguing that that any account of turn-taking should allow for contextual effects.

The second implication is that it looks as if speakers mark utterance endings particularly in the middle of turns more clearly when in disagreement, presumably to reduce the possibility of unwanted interruptions arising from any ambiguity (it should be remembered that it was only turn-medial judgements which differed significantly from chance). There has been a good deal of research into the structural organisation of argument (Koomen and Sagel, 1977; Roger, 1984; Trimboli and Walker, 1984; Vuchinich, 1984) but little acknowledgement that the fundamental way turn endings are marked in conditions of agreement and disagreement may differ. Of course this result is also interesting in that we know that arguments are characterised by higher levels of interruption (Roger, 1984; Trimboli and Walker, 1984) and whilst there is evidence that some interruptions in certain types of verbal interactions may arise from the misinterpretation of the signals used to synchronise conversation (Beattie et al., 1982) this is clearly not what is happening here. In agreement the overall percentage of speaker switches which involved some form of interruption was 14.4 compared with 29.3 in the disagreement (cf. chapter 3, section 3.1). Thus, disagreement was characterised by significantly higher levels of interruption despite the fact that the turn-final and turn-medial utterances were more clearly differentiated in the case of disagreement. Clearly the origin of the vast majority of interruptions is not the misinterpretation of signals marking the ends of turns.

The second part of this investigation was to do with subjects' ability to detect drawl at the ends of turns. Drawl was a cue, which was originally given equal weight by Duncan to the other turn-yielding signals he identified. Cutler and Pearson (1985), however, pointed out some problems in Duncan's discussion of drawl. An attempt was made here to systematically investigate whether subjects did discriminate turn-final and turn-medial utterances in terms of the apparent presence of drawl. It was found that they could do this, but only when they had a consecutive series of utterances from the same speaker as baseline (as of course they would have in a normal conversation). The perceived presence of drawl did not however significantly correlate with the judgement that the turn was complete. This suggests that drawl does not have a fixed meaning in relation to turn-taking in the face-to-face conversations studied in this research.

In summary, this study indicates the importance of prosodic and paralinguistic elements in the regulation of speaker turns. Subjects could discriminate turn-final and turn-medial utterances even when they were presented alone and out of context, but only when they were presented in auditory form and taken from conversations involving disagreement. Clearly discrete turn-taking cues exist as Duncan and Fiske suggested but it seems that they are only used in certain 'types' of conversations. Importantly, judges were unable to discriminate turn-final and turn-medial utterances when presented in isolation and in typescript form. This of course is not to deny the role of meaning or even grammatical structure in the regulation of speaker turns, but rather it is to assert that the auditory accompaniments of speech play an additional and important role. It thus seems that, at this stage, Slugoski's (1984) conclusions are premature. However, we will return to consider the role of verbal content in more detail in the next chapter. This study has also demonstrated that drawl is perceived to be associated with the ends of turns in conversation (at least when judges are given an appropriate baseline context) contrary to the doubts raised by Oller (1973) and Cutler and Pearson (1985). However, since drawl may be associated with the ends of syntactic constituents generally in conversation it cannot therefore function as a 'fixed' turn signal as Duncan and Fiske proposed. This suggests that drawl may be used differentially as a 'resource' in turn management (Wilson et al, 1984).

Thus this study has found that in disagreement local information carried in the verbal channel and present in isolated utterances is associated with the ends of turns, and, perhaps more importantly, the ends of utterances within turns, provides valuable information. However, in agreement it seems that fixed verbal cues are not used generally to mark and distinguish these locations and that the local context of the conversation may play a more important in synchronizing conversations. But how can the context of the conversation serve to demarcate appropriate locations for exchanging the turn? This question will be addressed in chapter 7.

Chapter 6

Vocal and Textual Features that distinguish Turn-final and Turn-medial Utterances during Travel Enquiry Calls[1]

6.1. Introduction

The aim of this chapter is to investigate some core aspects of turn-taking in natural telephone conversations. In particular, it is concerned with the means by which judges distinguish turn-final utterances[2] from turn-medial utterances.

In chapter 4 it was found that the incidence of the turn-yielding cues Duncan and Fiske identified did not consistently distinguish turn-final and turn-medial utterances that had been sampled from travel enquiry calls. In addition, it was observed that a notable proportion of smooth speaker-switches were preceded by a single-cue display. It was therefore suggested that other turn-yielding cues may be present in the verbal channel. This study will determine whether or not this information is discrete and identifiable independently of the context of the conversation. It will also investigate the role of verbal content in the turn-taking process. In chapter 4 it was suggested that because travel enquiry calls are fairly structured at certain stages verbal content may provide information about the course of a speaking turn. However, it should be noted that Walker and Trimboli (1984) have suggested that the syntactic and 'semantic' aspects of verbal content are of very limited importance in turn-taking. They argue that this limitation stems from the fact that the relationship between the turn so far and its completion in either purely lexical terms or meaning is highly variable. However, it should be noted that their consideration of syntactic elements was confined to the significance of grammatical completion (see also Wiemann and Knapp, 1975), which, as they observed, in the spoken utterance, relies heavily on intonational contours to define its boundary. They did not entertain the possibility that the syntactic structure of the utterance when considered in conjunction with its meaning may provide important information about the direction and completion of a speaking turn. Such a perspective could not be integrated into a cue-based model of turn-taking like Duncan and Fiske's, which assumes turn-taking cues are discrete. Slugoski (1984) has, however, argued that one aspect of verbal content - semantic closure - is important in turn-taking. Indeed

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1. See also Stephens and Beattie (1987).
2. As in the study in chapter 5 utterance is defined as being sentential in form with the proviso that such sentences need not be entirely grammatically correct or grammatically complete.

one experimental test he failed to find any role for prosody in the process. However, it has already been noted that there were a number of problems with the constructed segments of conversation he used in this study and as a consequence doubt has been cast on the generality and validity of his results (recall section 5.1. in chapter 5).

This study reopens the issue of the relative salience of verbal content and the vocal accompaniments of language in the turn-taking process. In addition, it will determine whether there is information in the verbal channel that does not have a fixed meaning in relation to turn-taking. It will do this by looking at the ability of judges to discriminate turn-final and turn-medial utterances on the basis of a typescript of the utterances or on the basis of an audio presentation of the utterances. In other words, it will test certain aspects of individual's conversational competence that will undoubtedly be utilised in actual conversation. This study looks at utterances from more structured conversations than those investigated in the last chapter - namely travel enquiry calls. Although these calls may be highly structured they still cover a range of topics from enquiries about specific arrival times to more complicated enquiries about the time and cost of a number of alternative routes. However, it should be emphasized that even in the most simple and straightforward of travel enquiry calls the conversations can differ in the order in which the required information is given. As the data base involves different operators, it is also possible to examine whether there are any individual differences between operators in the way they structure their speaker turns.

6.2. Data collection

6.2.1. Method

For this study the extracts of conversation were sampled from the corpus of travel enquiry calls, which were collected by Talbot (1985).

Extracts. From this corpus twelve calls were randomly selected from each of the three principal (male) operators[3], who answered the vast majority of the calls in this corpus. A turn-final utterance (i.e. an utterance immediately preceding a smooth speaker-switch) and a turn-medial utterance (i.e. an utterance from within a speaker turn) were taken from each of these calls and edited onto an audio tape in random order. There were 72 extracts in total.

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3. These calls were selected using a BASIC computer programme listed in appendix III.

6.3. Part A: Detection task

6.3.1. Method

Subjects and design. One hundred subjects were recruited from British Telecom's Human Factors subject panel. Their ages ranged from 17 to 62 years, with an average age of 32 years.

The subjects were assigned to one of the following two conditions; a) judgement of turn completion from audio presentation, or b) judgement of turn-completion from typescript. There were equal numbers in each condition.

Procedure. There were eighteen sessions in total with an average of 5 subjects per session. The subjects were asked to decide whether or not the speaker had finished talking, in a forced choice procedure.

Analyses of the data

The vast amount of data was collated using a modified version of the Fortran 77 programme noted in chapter 5 and listed in appendix V.

To test whether subjects could distinguish turn-final and turn-medial utterances the mean percentage judged completion rate given by each subject for these utterances was compared. A Wilcoxon Matched-Pairs Signed-Ranks Test was then used to ascertain whether the mean percentage completion judgement given by each subject for turn-final utterances differed significantly from those given for turn-medial utterances. To determine whether turn-final and turn-medial utterances differed in the frequency with which they implicated certain topics and syntactic constructions a Chi-squared Test was used. In cases where the expected frequency in at least one cell fell below five a Fisher Exact Probability Test was used.

6.3.2. Results

It was found that, overall, judges could distinguish turn-final and turn-medial utterances when presented in audio mode (Wilcoxon Matched-pairs Signed-ranks Test, Z=6.14, n=50, p<0.0001; 2-tailed; see Table 6.1). The mean percentage of completion judgements in audio mode for turn-final extracts was 61% and for turn-medial 36%. Judges were, however, unable to make this discrimination when the utterances were presented in typescript form; the corresponding figures were 59% and 56%, respectively

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Table 6.1: Mean percentage of operators' utterances judged to be complete

| Operators | Audio | | Typescript | |
	Turn-final	Turn-medial	Turn-final	Turn-medial
A	69.5	24.5	67.3	56.0
B	50.5	34.3	56.3	55.5
C	63.5	48.2	53.5	56.3
Mean	61.2	35.7	59.0	55.9

(Wilcoxon Test, $Z=1.91$, $n=50$, n.s). These results are in accordance with the findings of the study in the previous chapter.

These overall results, however, mask some important differences between operators. In the case of the *audio presentation* it was found that judges could distinguish the turn-final and turn-medial utterances of each of the operators (all the Wilcoxon Tests were significant at the 0.001 level). Judges were better at recognising the turn-final utterances of operators A and C than operator B. (The mean completion judgements for turn-final utterances of operators A, C and B were 70%, 64% and 51%, respectively.) For operators A and C the judgements of completion for turn-final utterances differed significantly from the level expected by chance (the Wilcoxon Tests were significant at the 0.05 level). This was not the case for operator B, whose turn-final extracts were judged at approximately chance level. Judgements of completion for turn-medial extracts in audio presentation for all the operators differed significantly from chance (the judgements were consistently below chance - in each case the Wilcoxon Tests were significant at the 0.01 level).

In the case of the *typescript presentation*, judges could not distinguish the turn-final and turn-medial utterances of operators B and C (mean completion judgements were approximately chance). They could, however, distinguish these utterances when they were taken from the text of operator A's calls (Wilcoxon Test, $Z=3.92$, $n=50$, $p<0.001$). The mean completion judgements for operator A's turn-final and turn-medial utterances in typescript presentation were 67% and 56%, respectively. The turn-final utterances of A were identified at above chance level (Wilcoxon Test,

Z=4.16, n=50, p<0.001) but the turn-medial utterances were not reliably identified (Wilcoxon Test, Z=1.08, n=50, n.s.).

In other words, judges were able to distinguish the three operators' turn-final and turn-medial utterances when presented in audio form. In addition, in the case of one operator - A - they were also able to make this discrimination on the basis of the verbal content alone. This result is particularly important given that psychologists have tended to give little weight to the role of verbal content in the turn-taking process (Slugoski, 1984, may, however, be a counter example). But what aspect of verbal content is actually important here? Was it what operator A said or the way in which it was said that enabled judges to distinguish turn-final and turn-medial utterances? Here this important issue is investigated.

6.4. Part B

6.4.1. Method

Procedure. The extracts used in part A covered a range of topics, from details of specific arrival times, to more general comments about where to find out the latest travel information (e.g., 'All that sort of information is on the TV screen'). Initially I thought it could be the case that judges might correctly associate certain topics with turn-final position and others with turn-medial position and that, in addition, the sample of operator A's utterances might have contained a higher proportion of turn-final and turn-medial topics, in appropriate positions, than any of the other two operators. To test this hypothesis, I categorized all the utterances used in part A into four main topic areas. These were defined as follows:

1) *Time* - utterances relating information about specific departure and arrival times, e.g., 'Leave Luton at one forty-nine' and 'It's in Luton at four thirty-eight'.

2) *Cost* - utterances relating information about the cost of a particular journey, e.g., 'The saver fare is eighteen-fifty', and 'The cost on a Friday is twenty-three pounds return'.

3) *Route/connection* - utterances referring to the route to be taken and the connections to be made, including assessments of the viability of a journey, given time and cost considerations, e.g., 'From Moorgate you get a direct

train through', and 'If you want to get there quickly you'll have to change at Peterborough'.

4) *Station services* - utterances making a general reference to any of the services offered on the station by British Rail, e.g., 'Come around to the information office', 'That - that message put or left in the enquiry office for the moment until we hear from you', and 'All that sort of information is on the TV screen'.

There were two other types of utterances - unusual statements and questions. There were only two unusual statements - 'Very nice beer down there' and 'If you worry about things like that you'd never go anywhere'. These were clearly very different from all the other types of utterances and so were put into a residual category. It was presumed that questions would be perceived as turn-final utterances - they were therefore not classified according to topic since they would bias the ratings of completion for any topic category in which they were included. It is important to note that inter-observer agreement between the author and an independent judge in classifying these utterances according to topic was 97%. The one disagreement was easily resolved by discussion.

6.4.2. Results

Table 6.2 shows the relative frequency with which the various topics appeared as turn-final or turn-medial utterances in the samples of conversation used in part A. It was found that whilst there was no significant difference in the frequency with which 'TIME' and 'STATION SERVICES' topics were used in turn-final and turn-medial utterances, there were differences between these utterances in the frequency with which 'COST' and 'ROUTE/CONNECTION' topics were used. The topic of 'COST' was used significantly more frequently in turn-final (implicating 22.2% of these utterances compared with 2.8% of turn-medial utterances, respectively; $\chi^2=4.35$, df=2, p<0.05). Conversely, 'ROUTE/CONNECTION' topics were used significantly more frequently in turn-medial (implicating 58.3% of turn-medial utterances and 33.3% of turn-final utterances; Fisher Exact Probability Test=0.012).

I was interested in the judges' completion judgements for these different topics. Table 6.3 shows the judged completion rate for all the utterances under each of the main topic categories (see final column) and also the actual frequency of 'yes' responses (the speaker has finished talking) and 'no' responses (the speaker has not finished talking). From this table it can be seen that 'TIME' and 'COST' topics attracted a higher proportion of turn-final judgements than 'ROUTE/CONNECTION' and 'STATION SERVICES' topics. This difference in judged completion rate was in fact significant

Table 6.2: Frequency with which different topics were used in turn-final utterances and turn-medial utterances

Topic	Turn-final		Turn-medial	
	Freq.	%	Freq.	%
Time	8	22.2	8	22.2
Cost	8	22.2	1	2.8
Route/connection	12	33.3	21	58.3
Station services	5	13.9	4	11.1
Residual	2	5.6	0	0
Question	1	2.8	2	5.6

Table 6.3: Frequency of yes/no responses for each topic

Topic	YES	NO	%YES
Time	555	245	69.4
Cost	303	147	67.3
Route/connection	827	823	50.1
Station services	212	238	47.1
Residual	42	58	42.0
Question	131	19	87.3

($\chi2$=117.19, df.=1, p<0.001). Moreover, from Table 6.4 it can be seen that these 'TIME/COST' utterances occurred most frequently in operator A's sample of utterances - a total of 13 times compared with a total of 8 and 4 times for operators B and C, respectively.

Table 6.4: Frequency with which each operator used the different topics in turn-final utterances and turn-medial utterances

Topic	Turn-final Operators			Turn-medial		
	A	B	C	A	B	C
Time	4	3	1	4	3	1
Cost	4	2	2	1	0	0
R/C*	3	4	5	6	6	9
Station services	1	2	2	1	2	1
Residual	0	0	2	0	0	0
Question	0	1	0	0	1	1

*R/C = Route/connection

This difference does not, however, explain how judges could only distinguish operator A's turn-final and turn-medial utterances on the basis of the typescript presentation. Basically the strategy of answering 'yes' (that is turn-final) to every 'TIME/COST' utterance, and 'no' (that is non-final) to all the other utterances. would have resulted in judges judging 15/24 of operator A's utterances correctly (because 8 of his turn-final utterances involved 'TIME/COST' topics and 7 of his turn-medial utterances involved 'ROUTE/CONNECTION' or 'STATION SERVICES' topics). The same strategy would have resulted in judges judging 14/24 of operator B and operator C's utterances correctly. Clearly in this case there would have been no difference between operators in the proportion of correctly judged utterances. So how did the judges make their decision?

6.4.3. Method

Procedure. The next stage of the analyses looked at the different ways in which the utterances were expressed irrespective of the topic. By examining the sample of

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utterances used in part A, 4 different modes, involving different syntactic 'frames', were identified. These were as follows:

1) W - sentential in form, with explicit subject and non-personal style, e.g., 'The eleven forty-five from Charing Cross gets to Tunbridge Wells at twelve forty-two', and 'And they all take roughly the same amount of time to get down there'.

2) X - sentential in form but the operator is personally oriented towards the caller, e.g., 'It wouldn't pay you on the one off trip but I was just thinking whether it would pay you to get a family rail card', and 'I daren't quote you a platform cause the chances are if I do it'll be different'.

(Of course use of the word 'you' is not necessarily concomitant with a more personal style; it can be used as a figure of speech as in the example, 'You're talking about umm forty-three pounds return'. Such utterances were classified as W's.)

3) Y - an 'imperative' typified by the omission of the subject, e.g., 'Leave Luton at one forty-nine', and 'Change at Peterborough only'.

4) Z - condensed utterance, e.g., 'Unrestricted three monthly return', and 'Forty-eight forty-nine pound'.

Inter-observer agreement in applying this scheme was 94%. The two disagreements were easily resolved by discussion.

6.4.4. Results

From Table 6.5 it can be seen that, with the exception of X, there were differences in the frequency with which the various frames were used in turn-final and turn-medial utterances. Frame W tended to occur more frequently in turn-final utterances, although this trend just failed to reach significance (χ^2=3.55, df.=1, critical value=3.84). Frames Y and Z tended to occur more frequently in turn-medial utterances, but only frame Z occurred significantly more frequently in turn-medial position (χ^2=4.05, df.=1, p<0.05; for frame Y the Fisher Exact Probability Test was not significant). Table 6.6 shows that, overall, judges did not in fact associate any particular frame with turn-final or turn-medial utterances. Table 6.7 shows that there were some differences between operator A and the other two operators in the way they framed their turn-final and

Table 6.5: Frequency with which different frames were used in turn-final utterances and turn-medial utterances

Frame	Turn-final		Turn-medial	
	Freq	%	Freq	%
W	16	48.5	9	26.5
X	11	33.3	10	29.4
Y	2	6.1	4	11.8
Z	4	12.1	11	32.3

Table 6.6: Frequency of yes/no responses for each frame

Frame	YES	NO	%YES
W	747	503	59.8
X	594	456	56.6
Y	163	137	54.3
Z	393	357	52.4
R	177	123	59.0

Table 6.7: Frequency with which each operator used different frames in turn-final and turn-medial utterances

Frame	Turn-final Operators			Turn-medial		
	A	B	C	A	B	C
W	6	6	4	4	1	4
X	4	3	4	4	3	3
Y	2	0	0	2	2	0
Z	0	2	2	2	5	4

turn-medial utterances. These centred around the use of frame Y for turn-final and frame Z for turn-medial. However, these differences involved small frequencies and therefore can not explain how judges could only distinguish operator A's turn-final and turn-medial utterances on the basis of the typescript presentation. So what aspect of verbal content were judges using to make their decision? There of course remains the possibility that operator A's utterances were distinguished by the particular topic and frame combination used.

Table 6.8 shows the frequency with which each operator used the different topic and frame combinations. One striking and, perhaps, initially rather perturbing thing about this table is the small frequencies. However, for each utterance in each of the particular topic/frame combination I also had the completion judgements of 50 other people - the subjects (see Table 6.9). I thus had reliable information about how each particular topic/frame combination was perceived. Importantly, Table 6.8 shows that judgements of completion did vary within topic according to the frame used. For example a turn-final 'ROUTE/CONNECTION' utterance attracted a relatively high proportion of completion judgements when uttered in frame W but not when uttered in frame X or Z. For 'ROUTE/CONNECTION' and 'STATION SERVICES' turn-medial utterances there was similar variation in the completion judgements according to the particular frame used.

However, I was particularly interested in whether the operators differed in the way they framed particular topics and whether this could account for the difference between operators in the completion judgements made on the basis of the typescript in part A. I proceeded by comparing each operators topic/frame combination (see Table 6.8) with the judgements of completion given for these combinations by the judges (see Table 6.9).

It can be seen that for operator A's turn-final utterances 9 utterances involved topic/frame combinations that received relatively high completion rates. For example, 4 of his turn-final utterances related cost information using frame W, which was judged complete 73% of the time. In contrast, for operators B and C only 5 turn-final utterances involved topic/frame combinations that received relatively high completion judgements. These included the way operator B framed his 'COST' utterances and the way operator C framed his 'ROUTE/CONNECTION' utterances. The other turn-final utterances of these operators involved topic/frame combinations that judges did not accurately perceive as turn-final on the basis of the typescript. For example operator B used X and Z frames for 'ROUTE/CONNECTION' information whilst a W frame would have attracted a higher proportion of completion judgements. Similarly operator C opted for frames for 'COST', 'ROUTE/CONNECTION' and

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Table 6.8: Frequency of each frame/topic combination for each operator

Frame	Time				Cost				R/C				Station				Grand total
	A	B	C	Total	A	B	C	Total	A	B	C	Total	A	B	C	Total	
Turn-final																	
W	1	3	1	5	4	1	0	5	1	0	2	3	0	2	1	3	16
X	2	0	0	2	0	1	1	2	2	2	2	6	0	0	1	1	11
Y	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	2
Z	0	0	0	0	0	0	1	1	0	2	1	3	0	0	0	0	4
Total	4	3	1	8	4	2	2	8	3	4	5	12	1	2	2	5	33*
Turn-medial																	
W	0	0	0	0	1	0	0	1	3	0	3	6	0	1	1	2	9
X	2	0	0	2	0	0	0	0	1	3	3	7	1	0	0	1	10
Y	2	0	0	2	0	0	0	0	0	2	0	2	0	0	0	0	4
Z	0	3	1	4	0	0	0	0	2	1	3	6	0	1	0	1	11
Total	4	3	1	8	1	0	0	1	6	6	9	21	1	2	1	4	34**

*1 question and 2 residuals excluded
** 2 questions excluded

Table 6.9: Frequency of yes/no responses for each topic/frame combination

Topic	Frame	Turn-final			Turn-medial		
		Yes	No	%	Yes	No	%
Time	W	176	74	70.4	0	0	0
	X	68	32	68.0	73	27	73.0
	Y	31	19	62.0	58	42	58.0
	Z	0	0	0	149	51	74.5
Cost	W	183	67	73.2	38	12	76.0
	X	66	34	66.0	0	0	0
	Y	0	0	0	0	0	0
	Z	16	34	32.0	0	0	0
Route/	W	111	39	74.0	143	157	47.7
connection	X	131	169	43.7	179	171	51.1
	Y	0	0	0	49	51	49.0
	Z	67	83	44.7	147	153	49.0
Station	W	69	81	46.0	27	73	27.0
services	X	32	18	64.0	45	5	90.0
	Y	25	25	50.0	0	0	0
	Z	0	0	0	14	36	28.0
Residual		42	58	42.0	0	0	0
Question		46	4	92.0	85	15	85.0

'STATION SERVICES' topics that did not attract high completion judgements. Interestingly, for turn-medial utterances there were no clear differences between operators in the frequency of topic/frame combinations that were accurately perceived by the judges as turn-medial. In other words, Operator A's sample of turn-medial utterances were not distinguished from those of the other two operators by topic/frame combinations that attracted relatively low completion judgements, given the general bias towards turn-final judgements (remember that for typescript presentation only the judgements of completion for operator A's turn-final utterances differed significantly from chance). The number of turn-medial utterances that correctly attracted relatively low completion judgements for operators A, B and C were 3, 2 and 4, respectively (they involved 'ROUTE/CONNECTION' information expressed using frame W and 'STATION SERVICES' information using frames W and Z).

Thus it can be seen that operator A's turn-final and turn-medial utterances were distinguished because, in his sample of turn-final utterances (compared with either of the turn-final samples of the other two operators) there were more utterances which involved topic/frame combinations that were correctly perceived by the judges as signifying completion.

6.5. Discussion

The first part of this study demonstrated that judges could distinguish turn-final and turn-medial utterances on the basis of information carried in the audio channel when the extracts were taken from structured telephone calls and presented out of context. All operators seemed to clearly mark their *turn-medial* utterances since these were identified at above chance level when presented in the audio mode. However, there were differences between operators in the way they marked their *turn-final* utterances. Two of the three operators' clearly marked these utterances (their turn-final extracts were identified at above chance level in audio presentation), only one operator did not (this operator's turn-final utterances were judged at approximately chance level). Interestingly in the study carried out in the last chapter it was found that, when the extracts were selected from face-to-face conversations involving disagreement, it was only turn-medial utterances (and not turn-final utterances) which were correctly identified. The results of this present investigation suggest that some speakers may therefore fundamentally modify the way they use prosodic information to mark utterance endings in turn-final position when conversing on the telephone. Perhaps more importantly this study has demonstrated that there is information in the verbal channel that does have a fixed function with respect to turn exchange.

This present study has also demonstrated that judges were able to distinguish the turn-final and turn-medial utterances taken from one particular operator (operator A) on the basis of typescript alone. More importantly, it was found that judges were better at recognising this operator's turn-final utterances than they were at recognising his turn-medial utterances (judgements of completion for turn-final utterances differed significantly from chance, but those for turn-medial did not).

The second part of the study has demonstrated that completion judgements made on the basis of the isolated presentation of utterances in typescript form vary within topic according to the syntactic frame used. It was found that judges correctly identified operator A's turn-final utterances because he employed particular topic/frame combinations that were accurately perceived as indicating turn-finality. This result has implications for approaches to the study of turn-taking. Cue based models of turn-taking have been developed on the assumption that verbal content does not play an important role in the turn-taking procedure and that what is crucial is the way the speaker marks the ends of their turns with turn-yielding cues, most of which it is argued are carried in the pitch, timing and intensity of the speech itself (see Duncan and Fiskes model, 1977, 1985). When the possible roles of meaning and the syntax (i.e. clause completion) in turn-taking have been considered they have to-date been considered quite independently from each other (see Slugoski, 1984; Walker and Trimboli, 1984). The results of this investigation strongly suggests that a different approach to the problem may need to be considered because the *interaction* between two important aspects of verbal content, namely topic, and type of syntactic frame was found to be crucial in allowing judges to distinguish turn-final and turn-medial utterances - at least in utterances taken from one highly structured type of conversation.

It should be emphasized that there is also preliminary evidence that topic/frame combinations are important in actual conversation and not just in judgement studies. In particular certain combinations of topic and frame have been found to feature predominately in the construction of turn-medial utterances. On most occasions these topic/frame combinations were constructions that in the judgement task had been perceived to be 'turn-medial'. For example:

> Operator: Ah in that case on this occasion you would be better to go to St. Pancras which is three stops on the circle line.

However, on some occasions the topic/frame combinations that were used in turn-medial position in conversation were constructions that in the judgement task had been perceived as 'turn-final'. For example:

> Operator: Coventry would be twenty-seven pounds.

When these particular topic/frame combinations did appear in actual conversation in turn-medial position both speakers and listeners could be seen to orient towards their 'turn-final' nature. Speakers often prefaced such constructions with remarks to override their apparent 'turn-final' nature (see note 1). For example:

> Operator: Actually *I'll give you both fares* and you can decide from that. Via the cross country route it's twenty-seven sixty and via London it's thirty-seven sixty.

However, if the speaker failed to do this the listeners would often attempt to take the speaker turn immediately after such constructions (see note 2). For example:

> Operator: There's one at nine forty-seven.[It's a] through train to Ely.
> Subscriber: [*Oh that*]

It thus appears that the topic/frame combinations analysed in this study affect not just judgements of turn completeness that are based on the isolated presentation of an utterance, but actual conversational interaction. Whilst the specific topic/frame features identified here are obviously limited to travel enquiry calls, it does raise the question of whether comparable combinations are of more general importance in turn management. In the next chapter this possibility shall be considered.

Notes.

1. It should be noted that on one occasion the operator did not override the significance of a 'turn-final' construction by a prefacing remark but instead asked the subscriber if they wanted this particular information. This particular instance is given below:

> Operator: You want me to give you both fares do you?
> Subscriber: Please.
> Operator: The
>   standard return fare is twenty-seven pounds. The saver fare is eighteen pounds fifty.

2. This analysis was based on a sample of 36 calls (12 randomly selected from each operator). It comprised of a total of 90 turn-medial utterances. It was found that 82% (74/90) of these turn-medial utterances involved topic/frame combinations that had been identified in this study. Of these turn-medial utterances 64% (47/74) involved combinations that in the judgement task had been perceived as 'turn-medial'. The remaining 36% (27/74) involved combinations that had been perceived as turn-final in the judgement task. In this latter category it was found that on 41% (11/27) of occasions a operators turn was prefaced with an explicit statement that the turn was to be extended, on a further 41% of occasions a subscriber attempted unsuccessfully to take the speaker turn, and only on 18% (5/27) of occasions did neither participants orient towards these utterances.

Chapter 7

Towards an Understanding of the Role of Textual Features in the Management of Face-to-face Conversation

In chapter 4 it was suggested that, in some face-to-face conversations in some situations, the local context of the conversation may play an important role in synchronizing an exchange of speaker turns. This suggestion was based on the finding that judges could not distinguish turn-final and turn-medial utterances taken from agreement when they were presented in isolation and in audio form (that is, on the basis of the local prosodic, semantic and syntactic information available). They could, however, do this when the extracts were taken from disagreement. The aim of this chapter is to carry out a preliminary investigation into some of the ways in which the verbal content of a speaking turn may direct participants in their interpretation of prosodic and paralinguistic elements. In other words, it will investigate the possibility that verbal content may provide important contextual information. One important way in which verbal content may do this is by providing a basic supra-structure to a turn that allows participants to predict the occurrence of a possible completion point. The focus of this chapter will be on investigating how participants exploit quite specific structural features of talk to project the ends of turns in conversation. In the last section of this chapter the possibility that certain combinations of topic/frame may play a role in regulating turn-taking in the face-to-face conversations will be investigated. In the last chapter it was suggested that particular topic/frame combinations may be important in the management of the turn-taking process in travel enquiry calls. However, the combinations identified in this particular study were obviously limited to these particular types of interaction, and there exists the possibility that in less task structured conversations such combinations may not be important[1]. Clearly the relative importance of topic (or content) and frame in allowing the identification of the ends of speaker turns is an issue of general importance in furthering our understanding of the turn-taking process.

That participants can project the ends of turns in conversation is evidenced by the fact that speakers can initiate the next speaker turn within 200 milliseconds of the completion of the prior turn (see, for example, Walker, 1982; Walker and Trimboli, 1982; Beattie and Barnard, 1979) and, for instance, by occasions where competing

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1. In chapter 3 (section 3.3.) it was reported that, in terms of the structure of the conversation, travel enquiry calls have been found to be predictable in that they pass through 5 main stages of information retrieval. The face-to-face conversations studied here were not formally structured in this way.

self-selectors come in at the same point in the conversation (Sacks, et al., 1974):

1) Mike: I know who d' guy is.
   Vic: [He's bad}
   James: [You kno}w the guy?

(taken from Sacks et al., 1974, p707)

2) Sue: Cause I agree with the IRA in principle.
   Paul: [You don't!}
   Lynn: [Do you! I'}m really
          dumbfounded.

(3:10.58.44)

Such observations can not be readily reconciled with a turn system, like the one Duncan and Fiske proposed, which assumes that participants respond to cues that are often clustered in the last syllables of the turn. So how do participants project possible completion points in order to come in as they do?

Jefferson (1973) has argued that in conversation there are a variety of sequences involving a series of sequentially placed speaker turns that are formal and intensely organised (for example, greeting, correction and closing sequences). She suggested that these structured sequences in which an utterance is embedded provide for 'predictive monitoring' by a participant and thus enables the next speaker turn to be precisely placed (see Jefferson, 1973, p54-55). But what about utterances that are not placed in formally structured sequences? Keller (1981) has found that participants generally attempt to structure and organise their discourse by the use of particular verbal expressions or gambits; such as 'in a nutshell', or 'what you're saying is' or a sequence involving 'first of all', 'second' and 'finally'. He suggested that gambits 'say more about the text that is to follow than they say about themselves' and therefore 'it follows that these expressions provide valuable cues to the overall structuring of discourse' (Keller, 1981, p111). Clearly from a turn-taking perspective such information could be used to help narrow down what may be construed as a possible completion point. Indeed in the case of the third example the first two phrases accomplish this by suspending the possibility of a completion point.

At a more local level a number of researchers have suggested that questions play an important role in structuring discourse because they provide a means of instructing a listener to take the speaker turn and, in addition, they specify how they should respond (Schegloff and Sacks, 1973; Kent, Davis and Shapiro, 1978). Beattie (1986) has shown that participants awareness of the possibilities questions provide for turn-taking is evidenced by their sensitivity to the formulation of these constructions. Based on his observations of multi-party tutorials, he noted that one

of the most obvious features of these interactions is that some students rarely make a contribution. He suggested that one way these students' actively avoided taking the turn was by not catching the tutors eye. However, he found that the most effective way to do this was not to totally avert gaze (for to do so would draw attention) but to selectively disengage gaze; what non-contributing students actually did was to project a possible completion point and make sure that they were not looking at the tutor when he or she reached that point. Beattie provided evidence that non-contributing students aversion of gaze (represented by superscript 'off') was in some cases related to the realisation that a question was under construction as the following example illustrates:

off
3)   Tutor: I think part of the - would you see any some protection against that?

(taken from Beattie, 1986)

For the student who did not want to contribute this strategy was reasonably successful since the tutors usually handed over the speaker turn to a student via a question that was addressed by eye-gaze.

In the face-to-face conversations that formed the basis of this research it was found that question construction implicated in the region of 18% smooth speaker-switches in each condition and in the case of overlaps 16% in agreement and 13% in disagreement. The participants clearly oriented to the formulation of a question. For instance, in the example below two participants (Mark and Tina) looked at the speaker as soon as they recognised a question in the making to see whether the speaker was using gaze to address the question to someone in particular. Interestingly, as the speaker did not look at anyone during the formulation of the first question none of the participants responded since they were still unsure whether it was an addressed or general question. (This ambiguity seems to stem from the use of the word 'you'.) In this example the auditors gaze at the speaker is represented by the superscript 'on', the speakers gaze at least one participant is represented by the subscript 'on' and the speakers aversion of gaze from all participants is represented by the subscript 'off':

4)   Linda: *on*
        Tina: *on*
        Mark: *on*
        Colin: I mean di- do you think the government should have cuts in
                off

        public expenditure? I mean Labour governments do don't they?
                                on off   *on*

(9:03.36.59)

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Similarly, in the following examples as soon as the participants realised a question was under construction two of them looked towards the speaker:

5)   Mark: *off*
        Sarah: *off*
        Ann: *on*   *off*
        Tim: No yeah no mention of the Yanks the fact that in only a fucking
                on

        Mark: *on*   *off*
        Sarah: *on*
        Tim: three three million Americans died during the whole of the

        Mark: *on*
        Ann: *on*
        Tim: second world war and what was it forty million Russians?

        (5:14.34.43)

6)   Jill: *off*
        Bill: *on*
        Ivan: *on*
        Karen: What about the Belgrano then?
                on

        (7:13.12.26)

Thus it can be seen that examining patterns of *gaze can be a useful way in which to* investigate those particular features of talk that participants orient to in order to project a completion point. However, as Beattie (1986) observed projectability has more usually been investigated by examining the placement of the second speaker's talk in relation to the first. In this chapter this shall be one of the main considerations in assessing the participants reactions to certain features of talk. For instance, in this corpus it was found that some overlaps resulted from participants orienting to the use of cliched expressions or idiomatic phrases[2]. At a local level it is possible that these phrases could be used predictively since as soon as the participants recognised the cliched expression (represented by italics in the examples below) under construction they could decide whether its completion would represent a possible completion point. For example:

7) Brenda: No it isn't because we've got them n[ow rig]ht. It totally
    Linda: [No but]
    Brenda: *sweeps it under the car[pet]*
    Linda: [But] Brenda the way that that it's it's
             worded in the CND motion is....

    (1:14.10.50)

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2. For a detailed exposition of the origin of different types of overlaps see Stephens and Beattie (in press a).

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8) Max: ...cause I felt everyone on that march was marching for
   Max: unilateralis[m an]d they *watered it do[wn]*
   Linda: [Yeah]   [Oh] I wouldn't march
             under freeze no way....

(1:15.37.32)

However, it must be said that such phrases were not used very frequently (a total of 10 times in this corpus). So what other features of talk are used to project the ends of turns?

One way in which participants may project an up and coming completion point is by exploiting their knowledge of the supra-structure of a speaking turn. Significantly, however, little is know about how such structures are constructed. One possible idea has emerged, however, from a series of studies that were concerned with ascertaining the units of encoding used in the production of language in conversation. It has been found that in uninterrupted spontaneous talk there is a cyclic pattern involving hesitant speech (i.e. high pause/phonation ratio) and fluent speech (i.e. low pause/phonation ratio; Henderson, Goldman-Eisler and Starbek, 1966). In one study the duration of these cycles was was found to range between 11 seconds to 39 seconds, with an average duration of 18 seconds (Butterworth, 1975; although Beattie 1983 reported that it takes 30 seconds of uninterrupted speech to identify a cycle). The amount of speech in a fluent phase has been found to be mathematically dependent on the amount of pausing in a preceding hesitant phase (Goldman-Eisler, 1967). This has been interpreted as evidence that periods of planning alternate between planning and execution phases. Whilst it has been argued that such patterns are discernable in randomly generated data (Jaffe, Breskin and Gerstman, 1972), two other researchers have provided convincing evidence that these cycles are in fact non-random events. For they have shown that in conversation temporal cycles are linked to semantic units and marked by certain patterns of gaze and gesture. Specifically, it has been found when subjects were presented with a typescript of an extended turn and asked to use their intuition to identify boundaries between different ideas, locations where there was high agreement between subjects corresponded to the beginnings of temporal cycles (Butterworth, 1975). In addition, it has been found that speakers tend to avert gaze more frequently during hesitant phases and gesticulate more frequently during fluent phases (Beattie, 1980). (You will recall that gaze and gesticulation have been found to act to preserve a speaking turn (Kendon, 1967; Duncan, 1972, respectively)). Beattie (1980) also reported that changes in the basic resting or equilibrium position of arms and hands tended to occur at clause junctures nearest the end of a temporal cycle and that listener-directed gaze was also high at these junctures. Furthermore, he found that listeners were more likely to attempt to

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take the speaking turn at clause junctures at the end of a temporal cycle than at any clause juncture within a turn. In this particular corpus changes in equilibrium and listener-directed gaze seemed to serve to yield a turn (Beattie, 1980). It is thus possible that awareness of the textual composition of a temporal cycle and the attendant nonverbal behaviours may form the basis from which an extended turn is constructed and recognised. However, there is a major problem with this proposition. Basically there is no evidence that the features associated with temporal cycles of an extended turn can be used to predict the end of a turn. As yet we have little understanding of how the textual composition of an extended turn may provide a listener with predictive information. It is possible that the subjects in Butterworth's (1975) experiment were using cohesive devices (Halliday and Hasan, 1976; for example, ellipsis, conjunction, anaphoric reference and pronominalisation) as textual markers to identify boundaries between ideas. Whilst such information may help provide a structure to a turn it can not be used predictively in conversation since cohesive devices only serve to relate or 'tie' an utterance to a preceding utterance and not to one that has yet to be spoken. Also although gaze aversion and gesticulation may play a supportive role in maintaining a turn locally, there is no evidence that, for example, the specific pattern of their use can be used predictively. In addition, since in order to identify a temporal cycle 30 seconds of uninterrupted speech is needed, the work reported above can not offer information about the composition and structure of shorter turns of talk. In short, there is no firm evidence that temporal cycles and their attendant features associated with them can be used as predictive devices in conversation.

One other possible suggestion about how participants exploit the structure of talk to project the end of speaking turns comes from some recent work on political speeches (Atkinson, 1984a&b). This suggestion will be considered in detail in the course of this chapter. A researcher - Atkinson - observed that in political speeches the members of the audience simultaneously begin to clap either just before or immediately after a possible completion point. Atkinson (1984a&b) suggested that for this to occur the audience must not only be paying attention to the ongoing talk but must be prospectively orienting to a completion point in advance of its occurrence. He speculated that public speakers construct their talk in such a way as to give the audience advance notice that a collective affiliative response is desired. In other words, he suggested that how a person speaks may be at least as important as what they say. His research confirmed his speculations, showing that applause can be elicited by the use of two particular rhetorical formats - three-parts list and two-part contrasts. An example of a three-part list provided by Atkinson (1984b, p60) is given below:

9) Tebbit: Labour
             1 - will spend and spend
             2 - and borrow and borrow
             3 - and tax and tax

Atkinson (1984b, p57) argued that such lists have an 'air of unity' or completness as the listing of three similar items serves to strengthen and amplify any message (and for politicians this may be interpreted as reflecting their resolve); lists of two seem inadequate as they do not eliminate any residual ambiguity about the link between the items. He argued that speakers orientation to the 'strength' of a three-part list can be seen when they have difficulty finding a suitable third item and use a redundant or vacuous phrases, such as 'and so on', 'something like that' or 'and everybody'[3], to complete the list. For members of the audience, on the other hand, orientation to the list format can be seen by the way they will wait patiently for the third slot to be filled and respond to a completed list even if the speaker gives other cues that they proposed to continue beyond this point. Atkinson concluded that these observations indicated the importance of list formats in projecting a completion point. However, he found that three-part lists were not used as frequently as the other rhetorical format, two-part contrasts. Atkinson suggested that contrastive pairs were prevalent in political speeches because they provided an adaptable, economical and persuasive technique for packaging assertions about 'us' and 'them':

10) Steel: The truth is beginning to dawn on our people that there are two
             conservative parties in this election
             a - one is offering the continuation of the policies we've had for
                 the last five years
             b - and the other is offering a return to the policies of forty years
                 ago

(taken from Atkinson, 1984b, p74)

Atkinson stressed that for the audience to use the two parts to anticipate a projected completion point the second part of the contrast needs to be readily recognisable and therefore must resemble the first part in both length, content and grammatical structure. He claimed that if the second part was too brief and delivered close to the completion point the audience would not have enough time to realise that a response was required. Contrariwise, he argued that if the second part was too long and detailed the audience were likely to lose the connection between the two parts and therefore not know when to respond. It is important to note however, that Atkinson also found if a speaker did produce a poorly balanced contrast they could rectify the situation by referring back and summarizing the gist of the applaudable message. He argued that this 'recompleting' effectively served to tell the audience that the preceding point deserved more attention than it was given.

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3. Jefferson (1973) coined the term 'generalised completers' to describe these phrases.

It is important to note that Atkinson observed that the use of contrast and list formats was often co-ordinated with prosodic and nonverbal behaviours that also gave the audience information about when they should respond; the underpinning assumption being that the more devices the speaker deployed the greater their chances of getting an immediate response of adequate intensity and duration. However, without the structure provided by verbal formats it was found that prosodic and nonverbal behaviours were not powerful enough to elicit a response from the audience.

Interestingly, Beattie (1986) has found that these list and contrast formats are also prevalent in political interviews involving Margaret Thatcher. Earlier Beattie et al., (1982) found in a judgement study based on extracts of Margaret Thatcher's talk that whilst generally vocal and nonverbal information was important in guiding judgements of completion, textual information (available in the typescript) was not, except in cases where the utterance contained a contrastive pair. When these contrasts were presented in audio form and the prosodic information indicated turn-finality, Beattie found that the level at which it was judged to be complete increased - in one instance from 75% (on the basis of the typescript) to 100% (on the basis of the audio presentation). However, consider the contrast given below, which has a very brief second part:

11) If you've got the money in your pocket you can choose
    a - whether you spend it on things which attract Value Added Tax
    b - or not.

(taken from Beattie, 1986)

From the typescript presentation this extract was judged to be complete 80% of the time. Interestingly, although prosodically this extract was marked as a non turn-final utterance from the audio presentation it was still judged to be complete 79% of the time. Beattie argued that this example pointed to the overriding importance of these formats in structuring turns and allowing projection of completion points to occur - at least in the speech of one particular senior politician. Further analysis of the interviews revealed that these features of talk not only structured turns at a local level but in some cases provided the fundamental suprasentential structure. For example:

12)   *a* - This country cannot stay in the 1919's
    1+*b* - it's got to come into the 1980's
        2 - it's got to think more about next weeks pay packet
        3 - it's got to think about the industries for our children
        1 - we got to be up to date in our working practices. Got to be efficient.
        2 - we've got to have profits to be able to invest
    a+3 - and we've got to think of not industrial muscle
        b - but what is a fair and reasonable price

(taken from Beattie, 1986)

But three-part lists and two-part contrasts are used as rhetorical devices by politicians so are they used in other types of verbal interaction?

There is some evidence that in ordinary conversation participants are oriented to the possibility of a list format, since it has been found that participants will delay their response until the list is completed even if they want to challenge a statement (Jefferson, 1973, in press). Although Jefferson notes that such structures could be used by participants to predict completion points, no firm evidence was presented that speakers and listeners actually do use these formats for turn-taking purposes. Here, however, this possibility will be investigated.

In the face-to-face conversations that formed the basis of this research it was found that both speakers and listeners clearly oriented towards features of talk[4]. However, whilst Atkinson has argued that list and contrast formats have to be obvious and simple to guarantee a response from the large *number* of people who form the audience, it will be seen that in these conversations participants responded to formats that were not as strictly composed as many of Atkinson's examples. It is possible that difference in the 'tightness' of construction is attributable to the fact that in Atkinson's corpus it is likely that many of the politicians had planned their speeches in advanced whereas in the corpus studied here the speakers were talking spontaneously. Given these differences the criteria that were used in this research to identify these formats will be outlined below. It is important to note that for three-part lists Atkinson did not give actually give any guidelines for their identification - the reader is left to deduce the criterion from inspecting the examples he presents. However, as Beattie (1986) points out it is not clear how some of the list formats can be justified. One particular example that Beattie took issue with is given below:

13) Heffer: The National Executive decided that we agreed in principle that
we must again try and get some constitutional ammendments
1 - before you
2 - at conference
3 - this week

(taken from Atkinson, 1984b, p62)

From the detailed account Atkinson gives of the accompanying prosodic and nonverbal behaviours it seems that he was in fact using this information to partition the utterance into a list. In this analyses, however, identification of a three-part list relied soley on the features of the verbal content. The operational definition employed was based on close inspection of Atkinsons clear examples of three-part lists and was as follows: a) lists of adjectives or adverbs, which may also include one or two

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4. This data was presented as a conference paper, Stephens and Beattie, 1986

generalised completers *or* b) lists of examples or elaborations marked by *either* i) the repetition of at least one word in each of the three items *or* ii) similar grammatical construction. Significantly, during the course of this discussion it will be seen that lists vary considerably in the length of talk used to construct them. With respect to the identification of contrasts, as noted earlier in this chapter, Atkinson stipulated that the two components must, for example, be similar in length. Here, however, as in Beattie (1986), the identification of this particular format relied on the contrast in meaning between the two parts.

Using the criteria outlined above a total of 48 examples of constructional formats were observed. To put this finding into perspective it is important to note many of these constructions spanned more than one utterance and yet this corpus yielded a limited number of extended turns. The average speaker turn was quite short; the mean length in agreement was 23 words and in disagreement 28 words, although as might be expected, in both cases the range was very large - between 1 and 146 words in agreement and 1 and 186 words in disagreement.

In this corpus 20 'straightforward' examples of three-part lists (8 in agreement and 12 in disagreement) and 10 'straightforward' examples of two-part contrasts (7 in agreement and 3 in disagreement) were observed. *In the two examples below it can* be seen that the speaker is orienting towards the list format, using a generalised completer to make-up the third part of the list:

> 14) Sue: ...therefore how can they be expected to be classed
> 1 - as rich
> 2 - or poor
> 3 - or whatever.
>
> (8:01.48.72)

> 15) Mark: ....when it can't survive until about
> 1 - twenty or
> 2 - thirty weeks
> 3 - or whatever
>
> (9:16.25.26)

Seven 'straightforward' lists actually took this form. The completion of these two particular lists also marked the completion of the speakers turn. In the two examples below it can be seen that the two part contrast relies on a contrast in meaning between the two elements. As noted above, I did not find the rigid contrast format which Atkinson (1984a&b) suggests is all important - that is a second part which involves repetition of much of the first part, changing only the contrasting element. Participants clearly oriented to these meaning contrasts. In the following examples completion of the contrast also marked the completion of the speakers turn:

16) Colin: Especially if they're determined to fight it
              a - over Europe and
              b - in Europe

(3:04.01.90)

17) Lesley: Knowing that she's
              a - given that child life
              b - rather than killing it.

(6:04.55.16)

I found that speakers were also oriented to the placement of these features of talk and when they were used within a turn in conversation, a speaker would use nonverbal cues in an attempt to override their significance. Gesture maintenance and gaze aversion have both been identified as turn-holding cues (see Duncan, 1972 and Kendon, 1967, although it was found in chapter 4 that these nonverbal turn-holding cues did not occur very frequently at turn-medial locations). In the examples below the duration of gesture is indicated by underlining, gaze at other participants by the superscript 'on' and gaze aversion by the superscript 'off'.

18) Tim: ...the British people are responsible for what happens in Ireland because
             1 - they have chosen to be totally ignorant of it and
             2 - have chosen to s- sweep it under the carpet and
             3 - have to chosen to point the finger of blame at us
             and say its our fault...

(5:16.57.68)

19)   *off on off*
    Colin: But the Tory M.P's wanted to have gotta look as if they're not

                          on   off
             a rubber stamps so they have to find an issue
                 on
             1 - which they can attack the government with
             2 - which wasn't going to do them any harm
                    off
             3 - which wasn't going to bring the government down
             And it was the perfect issue...

(9:01.23.80)

20) Tony: ...in fact it never will be a professional game because
                              on off
             a - it's not the big clubs that count
                              on off
             b - it's the small ones that make the game...

(4:04.48.16)

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21)   *off*
    Sue: ...you sh, I think
              a - people should work together on it and not
              b - split themselves down the middle on it.

    (3:05.57.12)

When speakers failed to use turn-holding cues and used these features in the middle of their turn listeners responded by attempting to begin the next turn. For example:

22) Tony: ...you you ban ban boxing so
             1 - why not ban rugby? You ban rugby
             2 - why not ban soccer?
             3 - why not ban any contact sport
             [and then]...
    Cath: [Because]

    (4:15.54.55)

23) Les: I'm sure your parents know what you're up to I mean
             1 - they don't want you to[tell them]
    Ian: [That's rig]ht
             2 - they don't want you to present it to them. They know but
             3 - they just don't want to accept it and that
             [It'll upset th]em so much
    Ian: [It's difficult]

    (6:04.39.49)

Of the five contrasts placed at turn-medial position only on one occasion did the speaker fail to use a turn-holding cue. Interestingly, in terms of the contrast in meaning, this was the weakest example observed in this corpus and yet one participant clearly oriented towards the completion of the contrastive format:

24) Anna: ... he's not the sort of person
             a - who gets upset normally
             b - but it really upset him
             [I rea]lly can't understand...
    Rachel: [Its a]

    (2:05.10.67)

Clearly at a local level these features of talk do play an important role in projecting the ends of turns in conversation. However, you will recall that Beattie (1986) found that in some cases the ends of speaker turns were projectable because the whole turn was constructed out of combinations of list and contrast formats. I also found examples of such combinations (6 in total) and two of them are given below. The first example is particularly interesting as the speaker 'interrupts' the contrastive pair to check whether one of the participants, who is waving her arm above her head, wants to urgently take over the speaker turn:

25) Carol: Well different students were doing it for different reasons.
    a - The ones who don't normally take part in that sort of thing
     were doing it because their parents were going to have to
     pay much more but
    do you want to say - oh your parents - your parents that's why
    Jackie was there
    b - and the ones like us who normally take part in that sort of
     thing were doing it cause they just don't think the grant
     should be
    1 - higher
    2 - or means tested
    3 - or anything.

   (9:02.10.16)

26) Ann: What about violence being you know that kind of violence sort
    of of kind of military creed
    1 - its not its a sort of an elite vanguard
    2 - its not about you know it doesn't it might have popular
     support
  a + 3 - but its its only perpetrated by a few elite
    b - and it excludes the vast majority of people it claims to
     represent or be freeing

   (5:18.49.56)

However, on two further occasions I found that an extended turn was constructed out of one list format. These lists did not adhere to the formats described so far in that at least one of the items was long and detailed. Beattie (1986) has suggested that participants will orient to list structures whose part members vary in length if they are anchored by, for example, the repeated use of a particular phrases such as 'you know'. In the example below, the participants oriented to an extended list format which relied on the fact that all the list elements were being used to give examples to illustrate a particular point (rather than any obvious anchoring device). This example shall now be considered in some detail. It will be seen that this list is much longer than any that were identified by Beattie (1986) or Atkinson (1984a&b). Yet the structure of the initial part of the turn seems to fall naturally into two identifiable elements, which leads to the expectation that a third and final element will be produced to complete the list. However the reason why the speaker chose the Germans as the third example is not immediately apparent and therefore requires some explanation. I would like to suggest that the speaker exploits the structure set-up by the two preceding elements to provide turn space for him to explain his third item. The first two items of the list are constructed out of two components - that is they both make some mention of an armed movement and legitimate tactics (albeit superficially) that could be used by that organisation. Given this, for the third element to complete the list, these two components must be provided. What the speaker actually does is to expand each one of these components in the third part of the list. Interestingly, after the first component of the third item had been expounded the speaker re-oriented the

participants to the list structure, and the up and coming completion point, by the repetition of the opening part of the third element (marked in italics in the example):

27) Tim: ...Well well I- I'll speak in my own terms there but

1 - I would support the IRA - as an Irish person - I support the right of the IRA to use any tactics to get the British out of Ireland

2 - I would defend totally the right of the Palestinians and the PLO to adopt any tactics they wished as well

3 - Umm and in many ways - cause I was talking to Kev last night - in many ways *I have alot of sympathy* - this is the controversial bit - *I have alot of sympathy with the Germans* umm at the moment especially the Germans who live in Berlin who err whose country is totally saturated with err American soldiers and wi- with Amer- American weapons - well most of them they walk round the streets with ar- you know with guns and things. I mean th- and *I have alot of sympathy with the Germans* and I think that if a really right wing extreme organisation in Germany started bumping off American soldiers I wouldn't sympathize politically with them but I think I'd feel myself sympathizing with them emotionally.

(5:14.45.60)

When the list was finally completed there was a smooth exchange of turns and the next speaker began to talk leaving no perceptible gap. This can be seen as providing tentative evidence that participants can orient to a developing list that is lengthy and detailed when the speaker gives some markers (i.e. repeating a particular phrase) to re-orient the participant to the list structure.

So far, it has been seen that listeners were oriented to what was required to complete a list or contrast format, responding promptly to its completion, and speakers were sensitive to the implications that the particular placement of list and contrast formats have for turn-taking.   However, there is some evidence that the list format specifically is not totally 'arresting' and in some cases a) a listener will not always wait for its completion and b) a speaker who develops this structure is not bound to complete it . On four occasions it was observed that, although there was a clear list structure developing, a participant interrupted the first speaker to challenge a particular point.

28) Ivan: ...cause all the experiments are sponsored by someone. Someones got to pay for them.

1 - And they want the results of the experiment fast.

2 - And they don't want to mess about with making sure that the animal is happy.

3 - An[d t]

Sue: [But] don't you think that if they are going to do experiments they should at least make sure the animal is...

(2:19.09.48)

29) Aden: ...other scabs and that sort of thing and going through that way.
              1 - And when that didn't work chasing that bloke home bashing
                  down his door and beating him up with base ball bats.
              2 - And when that didn't work, burning do[wn his house.]
    Karen: [They burned it?]
    Aden: Yeah.
              3 - When that didn't wor[k and he went to work after a few
    Shawn: [That was in the 'The Sun' yesterday
    Aden: [days.]
    Shawn: [but I']m sure 'The Sun' sensationalises it.

        (15:15.47.66)

Similarly, on five occasions it was observed that a speaker instead of providing the
third element of the list used another type of technique to communicate their intention
to end their turn. For instance, in the example below whilst the speaker appears to
be constructing a three-part list that will provide the structure for an extended turn she
indicates her intention to leave the list 'incomplete' by using a statement that concluded
the point she had developed thus far - *That's a terrible atmosphere to grow-up in and
develop ideas':*

30) Jill: I think it does.
              1 - *The school I was at* everybody was from the same
                  background. It wasn't 'till I got here - I know it's only
                  marginally different here - that people are from different
                  backgrounds.
              2 - *The school I was at* people were expected to go to
                  university. Now it's five percent of the population who got
                  to university. We were channelled towards that.
              That's a terrible atmosphere to grow-up in and develop ideas

        (7:18.12.33)

Moreover, one participant at least oriented to the significance of this last statement and
came in to overlap the last two words.   Another example of a potential list being
'terminated' by a concluding statement follows below. It can be seen that this time the
developing list was fairly short and simple:

31) Lisa: ...they campaigned on that stand but
              1 - *they had to put forward* Acts to Parliament
              2 - *they they had to put forward* practical steps towards that
              and *you're not going to get a change in Government or public
              opinion unless you can bring that balance.*

        (1:12.03.82)

Thus it seems that, like the recompleters Atkinson (1984b) observed, concluding
statements can serve to mark a completion point by overriding the participants
expectation that a list format is in the making. These two examples emphasize the
possibility that other textual features may have play a role in the turn-taking process in
these conversations. But what other features are there? Consider the following

examples of speaker turns which have been taken from the corpus of face-to-face conversations:

32a) Tim: Yes but going like that is ju- is just not as entertaining as proper boxing

(4:13.07.31)

b) Billy: Well that's what Mrs Thatcher and what Reagan said but actually there isn't a law on self-determination

(7:01.33.56)

c) Sue: Yes I think I do

(3:11.29.90)

d) Mike: Yeah I think it's twenty-seven

(5:16.05.56)

e) Rachel: There's no such thing

(2:16.05.16)

f) Colin: Right so I mean that argument just don't hold.

(9:17.02.34)

g) Sally: The majority of the people in the country agree with us and its only the politicians that bugger it up

(4:19.26.12)

What all these examples have in common is that the second speaker responded to the completed utterance immediately, that is without leaving a perceptible pause. On all these occasions the second speaker must have been anticipating the completion point but did any textual features play a role in this process? The problem in answering this question is that if such features were used they are not readily apparent - quite unlike Atkinson's list and contrast formats, which are easily identified. It is therefore clear that the descriptive approach adopted so far can not be used to determine if other textual features are of potential importance in the turn-taking process, a totally different approach is required. One way in which a new line of enquiry could proceed is by first trying to ascertain whether there is local textual information in a single utterance that guides judgements of completion. The judgement study reported in chapter 5 could be used as the basis of such an enquiry. For from this study there is data about judgements of completion that were based solely on the limited syntactic and semantic information available from the isolated presentation of the typescript of the extracts. This therefore offers information about how certain syntactic and semantic combinations were perceived in terms of the completion of a speaker turn. It thus offers a route for ascertaining whether such local textual features of topic and

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frame are potentially of some importance in guiding judgements of completion in casual conversation between friends. It should be emphasized that this is not an issue that can be investigated simply from inspection of the video tapes or transcripts.

It was claimed in chapter 5 that when subjects were presented with a typescript of an isolated utterance they could not discriminate turn-final and turn-medial utterances on the basis of the typescript. However this statement was based on the analysis of the overall mean completion rate. It does not take account of the 32 extracts that were judged complete by at least 70% of the judges on the basis of the typescript. But what semantics and what syntax? Closer inspection revealed that 6 extracts were correctly identified because they contained contrasts[5]. In the case of the remaining 26 extracts the explanation was not evident and in the remaining part of this chapter these judgements shall be used *a posterei* to try and determine whether they were founded on a systemmatic bases; that is, whether judgements of completion for a particular utterance vary according to how the utterance is expressed or framed. Clearly, if such variations exist then their significance could potentially be exploited by a speaker. However, it is also possible that because these face-to-face conversations were casual and relatively unconstrained (i.e. not limited by specific, explicit goals to obtain certain information with a consideration for cost) variations in how a topic is framed may have no implications for judgements of completion in such domains. Settlement of this issue would have implications for future studies of the turn-taking process.

Method

Procedure. The 26 extracts that had been correctly identified covered a wide range of topics from issues such as nuclear disarmament to boxing. Whilst there was some overlaps between extracts in the topics, it was not sufficient to allow them to be grouped under a few main headings. It was therefore not possible to proceed with the same type of analyses (i.e. the grouping procedure) that had been used in part B of chapter 6. Thus in order to explore whether topic co-varied with frame in guiding judgements of completion, it was decided to randomly select just eight extracts and manipulate each of these according to different syntactic 'rules'. These 'rules' were to be formulated by examining all the turn-final and turn-medial extracts to see if they had any common syntactic structures or frames. It should perhaps be emphasized that the aim was to determine whether in more causal conversations judgements of completion

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5. Three-part lists were not included in the judgement study (reported in chapter 5) as they often tended to span several sentences and in this particular study I was interested in the local information located in examples which were sentential in form, although not always grammatically correct or complete.

for a particular topic do vary with syntactic frame (as was the case in travel enquiry calls, chapter 6).

The next problem that had to be confronted was that there was not a very large pool of extracts available from which an attempt could be made to determine the syntactic 'rules' for turn-final and turn-medial frames. This difficulty was resolved by including in the analyses extracts that at least 70% of the judges had *in*correctly identified on the basis of the information available in the typescript; that is, turn-final extracts that had been regarded as turn-medial and turn-medial extracts that had been regarded as turn-final. These extracts were used to help identify frames for the type of utterance that judges had thought them to be (as opposed to what they actually were). This effectively increased the pool of turn-final extracts from 20 to 31 and turn-medial extracts from 6 to 18.

By using this pool of extracts an attempt was made to identify syntactic frames that were typically used in turn-final extracts and distinguished them from those that were typically used in turn-medial. Four turn-final frames were identified in this manner (note the similarity between these frames and some of those used in examples 32a-g). These were defined as follows:

1) A - conditional statements, e.g., 'If it comes to the end then the woman is left holding the baby', and 'Cruise should never arrive in this country in the first place but now it has they'll be unable to get rid of it'

2) B - a categorical (i.e. imperative) statements, e.g., 'There is no solution except a joint parliament', and 'It is not as high as in boxing'.

3) C - any construction which involved a personalised statement typified by reference to self, e.g., 'I think they will have to ditch that aim to get into power', and 'You're starting to reject their idea of what I think they call a nuclear defence policy'.

4) D - two propositions linked by 'and', e.g., 'The people that find boxing entertaining have said few woman enjoy the sport and the the majority are men as they have a violent streak in them anyway', and 'Abortion is acceptable in some cases and one case is rape'.

These frames accounted for 26 of the 31 turn-final extracts. For turn-medial extracts there was a greater variation in the types of syntactic frames used. Consequently, just

two frames were identified from the pool of turn-medial extracts. These were defined as follows:

5) E - utterance suggests speaker is uncertain about statement, e.g., 'They're probably unable to get rid of Cruise now even though it should never have arrived', and 'It probably isn't as high as in boxing'.

6) F - a filled pause inserted in a personalised statement after the first 'phrase' was completed, e.g., 'Cruise really shouldn't have arrived err for I don't see that they can get rid of them', and 'I am only in favour of abortion err in cases like rape'

These frames only accounted for 8 of the 20 turn-medial utterances.

In the next stage of the analyses each of the 8 extracts that had been randomly selected were reduced to their basic propositions. It was with reference to the propositions, rather than the original extract, that utterances were re-constructed using the different frames. The difficult part of this manipulation process was striving to keep the meaning of the original extract. (Clearly if no attempt had been made to do this the results would have been meaningless.)

The eight original utterances and their manipulations were shown to an independent judge, who studied each 'set' of utterances to check they all had the same meaning. There were eight disagreements in total but these were easily resolved by discussion.

The final 'set' of extracts were put in random order into a booklet so that on each page there was just one extract involving each topic and one example of each frame. It was believed that if on the same page the same topic had been manipulated in, for example, two different ways the subjects may have been tempted to ascertain what distinguished them and may have tried to base their judgement on a more 'rational' strategy.

Subjects. Twenty-five subjects took part in this experiment; some were postgraduate students and some were postdoctoral researchers. There were five sessions in total and an equal number of subjects in each.

The subjects were asked to decide whether or not the speaker of the extract had finished talking, in a forced-choice procedure. Subjects were asked to make the completion judgement on their immediate reaction to each extract and that once they had turned over the page not to return to the previous page to revise any of their answers.

Results

Overall it was found that turn-final frames were judged to be complete 62% of the time and turn-medial frames 55% of the time. Statistical analysis (based on the frequencies) showed that this difference was significant (χ^2=5.90, df=2, p<0.05). Table 7.1 shows the judged completion rate for all frames (see final column) and also the actual frequency of 'yes' responses (the speaker has finished speaking) and 'no' responses (the speaker has not finished speaking). It was found that none of the turn-final frames got significantly more completion judgements than the other turn-final frames and similarly for the turn-medial frames (all Chi-squared Tests were non significant).

Table 7.2 shows the judged completion rate for turn-final and turn-medial frames for each of the different topics. From this table it can be seen that the judges ability to identify turn-final and turn-medial frames varied as a function of the topic of the utterance. For instance, the overall percentage of turn-final frames judged complete ranged from 47 in the case of topic 4 to 77 in the case of topic 3. Similarly, for turn-medial frames the judged completion rate varied from 34% in the case of topic 8 to 66% in the case of topic 6. When the overall judgements of completion for turn-final frames were compared with the turn-medial frames for each topic it was found that there was a significant association between judgements of completion and turn-final frames for topics 5 and 8 (χ^2=4.51 and 5.23, respectively, df=1, p<0.05) but not for any of the other topics.

Table 7.3 shows the judged completion rate for each topic and frame combination. It can be seen that judgements of completion did vary within topic according to the frame used. For instance, topic 1 was judged to be complete when presented in frame B and C but not when presented in frame D. It is important to note that in 9 cases the topic/frame combination attracted a very high judged completion rate - over 70% of the judges perceived the extract to be turn-final in nature. Interestingly, however, using this criteria only 1 extract was clearly perceived to be turn-medial.

The next stage of the analyses focussed first on the judgements for turn-final frames and was directed towards ascertaining whether for any of the topics any of the frames were judged differently from the summed judgements given for the other turn-final frames. When this comparison was carried out with frame A versus the other turn-final frames for all the different topics it was found that neither of these groupings were significantly associated with completion judgements (all the Chi-squared Tests were non significant). For frame B, however, the Chi-squared Test was significant for topics 2 and 5, for frame C for topics 3, 4 and 5 and for frame D

Table 7.1: Frequency of yes/no responses for each turn-final and turn-medial frame

Frame	YES	NO	%YES
Turn-final frames			
A	83	42	66.4
B	99	76	56.6
C	115	60	65.7
D	125	75	62.5
Turn-medial frames			
E	114	86	57.0
F	106	94	53.0

Table 7.2: Frequency of yes/no responses for turn-final and turn-medial frames for each topic

Topic	Turn-final frames			Turn-medial frames		
	Yes	No	%Yes	Yes	No	%Yes
1	43	32	57.3	30	20	60.0
2	53	22	70.7	28	22	56.0
3	77	23	77.0	33	17	66.0
4	47	53	47.0	26	24	52.0
5	66	34	66.0	24	26	48.0
6	52	23	69.3	33	17	66.0
7	43	32	57.3	29	21	58.0
8	41	34	54.7	17	33	34.0

Table 7.3: Percentage of utterances judged complete for each topic/frame combination

Topics	Turn-final frames				Turn-medial frames	
	A	B	C	D	E	F
1	-	64	68	40*	60	60
2	-	48*	72	92*	52	60
3	84	84	60*	80	64	68
4	52	36	64*	36	64	40
5	64	44*	84	72	44	52
6	64	-	80	64	68	64
7	-	60	32*	80	64	52
8	68	60	-	36*	40	28

Note:

'-' indicates that the original extract used that particular frame

* indicates that the completion judgement for that particular frame was significantly different (i.e. at the 0.05 level) from the summed judgements for the other turn-final frames for that topic

for topics 1, 2 and 8 (the Chi-squared Tests were all significant at the 0.05 level). From Table 7.3 it can be seen which combinations were associated with completion judgements. When the 2 turn-medial frames were compared it was found that for all of the eight topics there was no significant differences in completion judgements given (all Chi-squared Tests were non significant).

Discussion

The results of this second investigation have shown that completion judgements made on the basis of the isolated presentation of a typescript of the utterances vary within topic according to the syntactic frame used. It was also found that whilst 9 particular combinations were clearly perceived by judges to be 'turn-final' in nature only 1 combination was perceived to be 'turn-medial'. It seems that topic/frame combinations are more important in allowing judges to 'identify' turn-final rather than turn-medial utterances. However, most importantly, it has demonstrated judgements of completion do vary according to topic and frame and such an interaction effect is not

just limited to specialised and highly constrained types of interactions, namely travel enquiry calls.

Of course it must be acknowledged that this investigation has only indicated that variations in topic and frame are of *potential* importance in turn-taking. Obviously to claim on the basis of such an investigation that co-variations in topic and frame are important in guiding judgements of completion in actual conversation involves a logical leap. For a start in this experiment the subject was asked to make a judgement when presented with the complete utterance whereas in actual conversation a participant makes this judgement in real time in a situation where effectively a word is revealed one at a time. Furthermore, in actual face-to-face conversation there is likely to be an interplay with information from other sources, such as prosody, supra-structure and kinesic movements, to guide judgements of completion. However, what this investigation has indicated is that on some occasions variation in topic and frame may have some influence in the decision of whether or not a person has finished speaking. The challenge now is to tease out when this may occur. One possibility would be to present subjects with a set of utterances, like those used in this present study, but this time gradually and sequentially exposing each word in the utterance using tachistoscope. After each presentation the subject could be asked to make a judgement about how far away the completion point was, the accuracy of these judgements giving some indication of the role of topic/frame features. However, such an investigation would not get away from the important fact that the utterances were not presented in a form that was not comparable with ordinary conversation. Clearly it would be better to investigate the possible role of topic and frame in making turn-taking judgements by presenting subjects with such stimulus in audio form. The effect of prosodic information on such judgements could be controlled systematically by using voice re-synthesis techniques. By examining the effect of 'turn-final' (c.f. Cutler and Pearson, 1985) and 'turn-medial' (c.f. Beattie, 1986) contours on the accuracy of guessing when a completion point is up and coming it may be possible to tease out the effects of topic/frame in guiding completion judgements. (This method is comparable to the one used by Beattie (1986) where he used judgements of completion based on audio and typescript presentation of an utterance to assess the importance of contrastive pairs in deciding that an utterance was complete.) Although such experimental manipulations are obviously very contrived they do appear to offer a way of trying to get to grips with how these aspects of verbal content are exploited in turn-taking.

In conclusion, it can be seen that in this chapter an attempt was made to gain an understanding of some of the ways verbal content may play a role in the turn-taking process. A descriptive approach was adopted to attempt to get to grips with the way

participants may use the structural aspects of verbal content to construct a turn of talk. It has been indicated that as yet we have had little idea about how this is accomplished. It has been seen that the use of three-part lists and two-part contrasts can be used to provide a supra-sentential structure and, in addition, more local structure within an utterance. It has been demonstrated that both speakers and listeners are sensitive to the possibilities for turn-taking that such constructions provide. It has been emphasized that this is just one way that verbal content may be exploited in the turn-taking procedure. The results of the experiment at the end of this chapter have provided evidence that other aspects of verbal content - namely the particular combination of topic and frame - may also be important in guiding judgements of completion. This requires further investigation, however. As noted at the end of the last chapter evidence that verbal content is used in making completion judgements has important implications for future of the development of cue based models of turn-taking. The analysis in this chapter has indicated that verbal content is not just exploited for turn-taking purposes in highly constrained and organised telephone conversations but is also exploited in more casual face-to-face conversation. We have thus taken a step towards understanding the role of textual features in casual conversation between friends.

Chapter 8

Conclusions

Two models of turn-taking have been proposed. One has come from within the discipline of Psychology and the other from Ethnomethodology. The proponents of the Ethnomethodological model summarise its main features as follows:

> 'The turn-taking system for conversation can be described in terms of two components and a set of rules....There are various unit-types with which a speaker may set out to construct a turn. Unit-types for English include sentential, clausal, phrasal, and lexical constructions. Instances of the unit-types so usable allow a projection of the unit-type under way, and what, roughly, it will take for an instance of that unit to be completed. Unit-types that lack the feature of projectability may not usable in the same way. For the unit-types a speaker employs in starting the construction of a turn's talk, the speaker is initially entitled, in having a "turn", to one such unit. The first possible completion of a first such unit constitutes an initial transition-relevance place. Transfer of speakership is coordinated by reference to such transition-relevance places, which any unit-type instance will reach.... Turn-allocational techniques are distributed into two groups: (a) those in which next turn is allocated by current speaker selecting a next speaker; and (b) those in which a next turn is allocated by self-selection....a basic set of rules governing turn construction, providing for the allocation of a next turn to one party, and coordinating transfer so as to minimize gap and overlap....At initial turn-constructional unit's initial transition-relevance place: (a) If the turn-so-far is so constructed as to involve the use of a "current speaker selects next" techniques, then the party so selected has rights, and is obliged, to take next turn to speak....(b) If the turn-so-far is so constructed as not to involve the use of a "current speaker selects next" technique, self-selection for the next speakership may, but need not, be instituted, with the first starter acquiring rights to a turn....(c) If the turn-so-far is so constructed as not to involve the use of a "current speaker selects next" technique, then current speaker may, but need not, continue, unless another self-selects....The ordering of the rules serves to constrain each of the options the rules provide.'
> (Sacks et al, 1978, p12-13)

This particular model, however, lacks definitional rigour (see chapter 2). With respect to the turn-constructional component, it has been argued that the concept of a unit-type is not clearly defined (Beattie, 1983; Wilson et al., 1984; McLaughlin, 1984). For instance, although Sacks et al., emphasize the importance of syntactic information in predicting a completion point, they do not outline how this information is actually used (McLaughlin, 1984). In addition, since a number of unit-types can be completed within a single speaking turn, it is not clear how a listener is able to identify a completed unit that is not intended as a turn ending (Beattie, 1983). Furthermore, Sacks et al., do not state what features distinguish those unit-types that can be used to project a possible completion point from those unit-types that can not be used in this way. With respect to the turn-allocational component, it has been argued

that Sacks et al., do not provide adequate criteria for determining which rule is being followed to allocate the turn (Edmondson, 1981). Specifically, it is not always clear whether a speaking turn has been allocated by a current speaker affiliating an adjacency pair to a particular listener or by a particular listener self-selecting. As a consequence of these shortcomings it was not possible to strictly test this model on empirical data. In this thesis attention was focussed on the psychological model, which is described as follows[1]:

> '...the exchange of a speaking turn - that is, drawing the boundary of a turn unit - was properly accomplished in the conversations we studied through the coordinated, three-step action sequence involving both speaker and auditor: (1) the speaker activates a speaker turn signal and does not concurrently activate the gesticulation signal...; (2) the auditor becomes the new speaker, beginning a new speaking turn and concurrently activating the speaker-state signal; and (3) the erstwhile speaker yields the turn, that is, does not continue the original turn and shifts to auditor state.'
> (Duncan, 1983, 150)

> 'An intriguing aspect of the hypothesized turn signal is that its cues were found in every communication modality examined: speech content, syntax, intonation, paralanguage, and body motion. The organisation of the cues within the signal is quite simple: the occurrence of any single cue is sufficient to constitute a display of the signal.'
> (Duncan, 1979, p94)

> 'The auditor is not obliged to take the turn when a signal is displayed. Rather, the signal is hypothesized to mark points in the stream of interaction at which the auditor may appropriately act to take the turn if so inclined.'
> (Duncan and Fiske, 1985, p45)

> 'With respect to the turn and gesticulation signals, it is possible to hypothesize for each participant at each moment in the interaction some tendency to desire either an exchange of the turn or a retention of the current speaker-auditor status quo. This desire may be hypothesized in terms of a transition-readiness state...Through periodic signal activation the speaker can represent his current status on transition readiness. Specifically, through activating or not activating turn cues the speaker can indicate a point on the scale from zero to six (or whatever the maximum number of turn cues proves to be). Moreover, by activating the gesticulation signal, it appears that the speaker can indicate a zero value for transition readiness...'
> (Duncan and Fiske, 1977, p196-7)

In other words, Duncan proposed that the smooth management of conversation is dependent upon discrete cues, most of which are carried in the pitch, timing and intensity of the speech itself. Little emphasis was placed on the role of verbal content; Duncan simply suggests that redundant phrases (or sociocentric sequences),

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1. As Duncan's model was developed over a number of years the quotations were selected from various publications.

such as 'you know', can be used to mark the ends of turns in conversation. The work carried out in this thesis, however, has demonstrated that this model is inadequate. In chapter 2 it was argued that there are a number of important shortcomings in the methodological and conceptual analysis which underpin the model.

Briefly, one of the main methodological problems stems from the fact that speech was transcribed with reference to the discourse context and consequently there exists the possibility that the scoring of the prosodic features was affected by the syntax, content and known position of the utterance within the turn (Cutler and Pearson, 1985). In addition, the statistical analysis Duncan carried out was unreliable given the distribution of his data and limited for it gave no information about the relative importance of each individual cue (Beattie, 1981a). Clearly it was crucial to carry out a more thorough test of Duncan's proposal and attempt to ascertain whether the distribution of turn-yielding cues and visual behaviours could actually account for the patterns of turn exchange found in conversation.

The main conceptual problem with Duncan's model revolved around his assumption that the cues involved in mediating a smooth turn exchange have a fixed and predetermined function. It has been argued that this perspective is too rigid given that we are dealing with a flexible system that appears to operate equally effectively across a variety of settings, for example conversations can be managed smoothly on the telephone, without visual contact. Specifically, it has been proposed that events in conversation do not have a fixed implications for turn-taking but that context plays a crucial role in the selection of events in the immediate situation that are employed as turn-taking cues (Wilson et al., 1984). It was also suggested in chapter 2 that Duncan's perspective had limited the type of factors that have been considered as contenders for turn-taking cues; for instance, it has resulted in variable features, such as meaning completeness, being neglected. Obviously whether the researcher assumes that turn-taking cues function in either a fixed or flexible manner has profound implications for the research methodologies they adopt and hence settlement of this issue is a matter of some urgency. Another conceptual difficulty with Duncan's model outlined in chapter 2 was that he tended to focus on how the ends of utterances are marked and therefore did not deal directly with the question of how listeners are able to anticipate the ends of turns. However, you will recall a notable proportion of turn transitions involve very short latencies, which indicates that the second speaker must be anticipating the completion point before it occurs. An understanding of how this is accomplished is evidently necessary before a complete and viable model of turn-taking can be proposed. Thus in chapter 2 it was seen that the methodological and conceptual limitations of Duncan's model actually helped to

highlight central issues whose investigation was necessary to provide a greater understanding of the turn-taking system.

It was the fundamental issues raised by the problems associated with Duncan's methodological and conceptual analysis that this thesis set out to address. The methodology employed involved a combination of micro-analysis of conversational material and experimental methods. It thus represented one of the first endeavours to combine the more quantitative approach of social psychology with the more qualitative approach of other disciplines in one research programme. The results of the investigations that were carried out will now be reviewed. This will include consideration of the immediate and most pressing questions that future research should confront and suggestions about how these may be tackled. The practical implications of the research carried out in this thesis will be discussed.

The first substantive result of this research was that the empirical test of the importance of Duncan's turn-taking cues (reported in chapter 4) provided little evidence to support his account. Specifically, it was found that across a variety of conversations the use of turn-yielding did not distinguish turn-final from turn-medial utterances.

In the case of the face-to-face conversations it was found that two turn-yielding cues, grammatical completion and intonation change, marked the majority of utterances, whether they were turn-final or turn-medial. Furthermore, turn-final and turn-medial utterances were not distinguished by the use of the visual turn-preserving cues. In other words, the same set of cues marked both turn-final and turn-medial utterances. The participants were not responding simply to clusters of turn-yielding cues, unlike those Beattie (1981a) observed in tutorial sessions.

In the case of the travel enquiry calls *single*-cue displays marked a notable proportion of turn-final and turn-medial utterances. For turn-final utterances the vast majority of these displays involved either grammatical completion or intonation change. Two examples of utterances which were only marked by a change in intonation (indicated by '*') are given below:

Operator: British Rail *
Subscriber: Ah good afternoon. Umm can you please tell
               me...
(C, S1)

Subscriber: Yes that's OK. That's fine and I'll get my tickets tomorrow.
Operator: Yeap.
Subscriber: Fine*
(A, S12)

For turn-medial utterances the majority of single-cue displays involved grammatical completion. (In the case of directory enquiry calls there were too few turn-medial utterances to draw any firm conclusions about the use of cues at these two locations.) Interestingly, in both the face-to-face and travel enquiry conversations on some occasions turn-final utterances were marked differently from the immediately preceding turn-medial utterance. In other words, there was some evidence that the particular sequential patterning of turn-yielding cues may be important in distinguishing locations where it was appropriate to take the turn from locations where it was inappropriate. This was interpreted as indicating that the significance for turn-taking attributed to yielding cues is not fixed but varies according to the local context of the conversation. However, it was noted that it was possible that in some cases participants were not responding to what appeared to be a sequential patterning of cues for they were not treating grammatical completion as a turn-yielding cue. Consequently turn-medial utterances that were marked by this cue alone were readily distinguished from turn-final utterances which were marked by additional turn-yielding cues. The overall conclusion of this investigation was that the turn-taking cues Duncan identified could not provide an adequate explanation of how a smooth speaker-switch was actualised at a particular location in the sample of conversations studied.

The next series of studies reported in this thesis (in chapters' 5 and 6) investigated whether conversation is managed by cues that have a fixed and predetermined meaning (i.e. Duncan's perspective) or by cues whose significance varies according to contextual factors (i.e. Wilson et al.,'s perspective). These studies provided evidence to support Duncan's theoretical perspective. They demonstrated that subjects could distinguish turn-final and turn-medial utterances when they were taken from certain telephone and face-to-face conversations, i.e. those involving travel enquiries and disagreement, respectively and presented out of context in audio form. They could not, however, reliably make this distinction when these utterances were presented in typescript form, indicating that grammatical completion *alone* is not treated as a turn-yielding cue. In other words, subjects were not able to decide what constituted the end of a speaking turn on the basis of the syntax and semantics of an isolated utterance but could when the additional prosodic and paralinguistic information was available. Importantly, since it was already established in chapter 4 that turn-final and turn-medial utterances were not generally distinguished in terms of the incidence of turn-yielding cues, it was ventured that Duncan's list of cues was by no means exhaustive. However, what was also important about these judgement studies is that they provided evidence to support the alternative theoretical perspective proposed by Wilson et al., (1984); that is, turn-taking cues are only identifiable with recourse to contextual information. For it was found that subjects could not distinguish

turn-final and turn-medial utterances on the basis of information available in the isolated audio presentation when they were taken from conversations involving agreement. Thus these judgement studies revealed that both perspectives are justified since the types of cues (fixed/flexible) used to synchronise the exchange of turns varies across different conversations.

The next series of investigations were directed towards investigating how contextual information could provide information for turn-taking. It was noted that whilst Wilson et al., (1984) argued that contextual factors, such as the sequential environment, social situation, and relational history, affect the implications that events in conversation have for turn-taking, they only explained in very general terms how they believed such factors operated to indicate appropriate locations for turn exchange. Clearly these suggestions needed to be followed up in some detail. Thus in chapters 6 and 7 an attempt was made to explicate how the sequential environment, provided by aspects of verbal content, may furnish salient contextual turn-taking information. In chapter 7 this involved focussing on investigating how the structural component of verbal content may be exploited. Little is known about how the structure of a turn is constructed, although some previous work has been directed towards looking at the role of ideational boundaries (see chapter 7). However, detailed exploration of the structure talk revealed that in face-to-face conversation specific formats - three-part lists and two-part contrasts - sometimes provided the sentential or suprasentential structure to a turn at talk. Importantly, evidence was supplied that both listeners and speakers were oriented to the possibilities that the completion of these formats provided for turn-taking. For instance, listeners generally responded to the completion of a format by attempting to take over the speaker turn. Thus a completed format at the end of a turn often resulted in a smooth speaker-switch, as in the example give below:

Sally: ...I think its a bit like the abortion limit, the day limit. It's an
             arbitary limit
             a - where you can do something
             b - and where you can not.
             (5:02.36.45)

However, when a format was completed in the middle of a speaking turn and a turn-holding cue (such as, gesticulation or gaze aversion) was not used, this often resulted in an interruption. For example:

Julie: I think it was a bit of both. I think she was sort of
             1 - too small or
             2 - too young or
             3 - something
             [And th]en it....
Kate: [That's]
             (10:00.32.48)

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Evidence was provided that participants also oriented to list formats that were not tightly constructed and that these formats could be used to provide turn space for extended talk. It was ventured that participants could identify list or contrast format in the making and exploit this knowledge to predict the location of an up and coming completion point. (As was noted earlier in this thesis Duncan and Fiskes' model did not directly address the question of how participants project the ends of speaking turns.) Additional investigations demonstrated that verbal content not only supplies higher order information but also provides important local turn-taking information. Specifically, evidence was provided that on some occasions certain combinations of topic and frame were of potential importance in the management of casual face-to-face conversations. However, it was acknowledged that more work was required to examine precisley the role these aspects of talk played in turn management and suggestions were offered about how this research should proceed. More conclusive evidence was provided, however, which demonstrated that topic/frame combinations were crucial in guiding judgements of completion in travel enquiry calls.

Evidence that verbal content is important in the mediation of the turn-taking process is of great theoretical importance for approaches to the study of turn-taking. To date psychologists have given little weight to the role of verbal content in the management of the turn-taking process and cue based models have been proposed on the assumption that verbal content does not play a major role in this process. The results of the investigations reported in chapters 6 and 7 strongly suggest that a purely cue based model of turn-taking is inadequate. However, since the judgement studies demonstrated that discrete cues do exist it must be emphasized that this approach is clearly not entirely inappropriate, as Wilson et al., (1984) suggest. The evidence available so far would seem to indicate that the smooth management of conversation relies on the use of discrete and contextual information. However, we can not yet in a position to outline the details of a model that includes both of these types of information. This model would have to be based on an understanding of the identity of the fixed, predetermined cues, precisely how and what contextual information is exploited for turn-taking purposes and the factors that affect the use and interaction of fixed cues and contextual information. Let us now briefly consider how future researchers may tackle these issues.

How then might it be possible for future researchers to seek to determine the identity of the fixed cues that are used to regulate turn exchange in some conversations? It has already been stated (in chapter 2) that a descriptive approach can serve to outline features that are possible contenders for turn-taking cues. However, it is not possible to be certain that those characteristics identified by the analyst are the ones used by the participants to distinguish turn-final and turn-medial utterances. To

overcome this limitation in chapter 5 a judgement methodology was employed. It was used to determine whether one feature, drawl, was perceived to be associated with turn completion. (This was a turn-yielding cue with which there were serious problems associated with its transcription.) Some additional pilot work carried out by this author has also provided further support for the suggestion that the combined use of descriptive and judgement approaches may be a useful way to try and identify fixed turn-taking cues. This work was directed towards ascertaining the local features of talk that enabled subjects in the judgement study, reported in chapter 5 (part A), to distinguish some turn-final and turn-medial utterances, i.e. those taken from conversations involving disagreement, but not others, i.e. those taken from conversations involving agreement. After making a transcript of all the extracts that were correctly identified (i.e. by over 70% of all the judges) in the judgement study, it was hypothesized that perceived clipping of the final syllables of the last word and an increase in speech rate across an utterance might be interpreted as a cue that a speaker desired to say something else. When 50 subjects were asked to make judgements about the presence of these features in the set of extracts used in part B of chapter 5, it was found that perceived clipping of final syllables (but not perceived speeding) was significantly correlated with judgements that a turn was *incomplete*. Importantly, this correlation was only significant in the case of extracts taken from conversations involving disagreement and was not significant in the case of extracts taken from conversations involving agreement. This can be seen as tentative evidence that judges may have been using perceived shortening of the final syllables of the final word of the utterance as a cue that it was taken from the middle of a speakers turn at talk. But perhaps more importantly, it can be seen as evidence that this methodology does offer a way of teasing out features that provide salient turn-taking information from features that just happen to be present.

It is clearly important that future research investigates how the sequential environment and other contextual factors affect turn-taking. With respect to the role of verbal content in turn-taking, it may be fruitful to try and establish whether there are other structures, like lists and contrasts, that set-up expectations about the talk that is to follow and thereby provide a vital predictive resource. One line in which this work could take would be to relax further the criteria used to identify lists and contrasts for there is evidence that participants are sensitive to very lax structures. For instance, Beattie (1986) provided some evidence that participants orient towards three-part lists that are anchored around the repeated use of the parenthetic phrase 'you know'. In the example Beattie provides, however, the turn was only constructed out of 34 words. It could be the case that participants orient to anchoring devices that structure much longer turns at talk. Re-orientation to the significance of these phrases may well be re-inforced by, for example, the co-occurrence of particular gestures.

Another course future investigations could take would be to carry out further judgements studies based on conversations conducted in relatively constrained domains (like those involving travel enquiries) since these may reveal that other quite specific aspects of talk, namely topic and mode of expression, have implications for turn-taking. It is thus possible that looking more closely at the construction of turns at talk, both structurally and in terms of mode of expression, may at last provide us with a route for understanding how participants project the ends of turns in conversation.

Having established the identity of the fixed cues used to regulate conversation and how contextual information is exploited in this process, it would be necessary to investigate in some detail what factors influence the speakers decision to use fixed or flexible cues. It would also be important to establish an understanding of how these two elements operate together; specifically, investigating the relative importance of discrete cues and contextual information in the turn-taking process and teasing out which features are more decisive and carry the most weight in which social situations. It is possible, for instance, that discrete cues may have no *significance* for turn exchange when embedded in certain turn structures, such as the second element of a three-part list. It is also possible that the interpretation given to an ambiguous variant of a fixed cue (e.g. a fall in intonation may be treated in some circumstances as a turn-yielding cue but a fall that does not descend very low may provide ambiguous information, c.f. Beattie et al., 1982) may depend on the structure of talk in which it is embedded. One way *in which investigation of these questions* could begin would be to manipulate the prosodic features of talk, using speech re-synthesis techniques, and ask subjects to make judgements of completion. Whilst such techniques are contrived, they do offer a starting place for trying to get to grips with the complex interactions involved in the turn-taking process.

In summary, it can be seen that although the work in this thesis has gone some way to resolving some fundamental issues surrounding how the smooth exchange of speaking turns is accomplished, it has also revealed a set of additional issues that have yet to be resolved before a model of turn-taking can be proposed. However, despite this current uncertainty there are important implications resulting from the work carried out in this thesis. It is to these issues that we shall now turn.

Perhaps the most direct and specific practical application of the work in *this thesis* arises from the results of the judgement study which was based on conversations sampled from travel enquiry calls. You will recall that it was found that certain aspects of verbal content, specifically certain combinations of topic and mode of expression, were important in guiding judgements of completion. This result potentially has

important implications with regard to the development of software for artificial intelligence systems, which could be used for the remote access of information using speech (e.g. telephone train enquiries, directory enquiry calls). In chapter 3 it was noted that for optimal communication between a user and a system using this technology, it would be necessary to equip the system with the means to both signal and recognise the end of speaking turns. Since decisions must be made about how to structure a machine's talk, it would be relatively straightforward, given the results of this particular study, to ensure that the machine used appropriate topic/frame combinations in turn-final and turn-medial position in travel enquiry calls. Yet by doing so this could conceivably result in quite important gains in terms of the efficiency of the turn-taking process in conversations between people and machines.

When viewed from a broader perspective the evidence that situational factors may influence a participants use of fixed functioning cues and contextual information can be seen to have a bearing on our understanding of the development of interpersonal relationships within an encounter, specifically how participants assess an interaction. In the past consideration of the link between the turn system and relational matters has focussed on the importance of the patterns of turn exchange (see Duncan, 1979; Wiemann, 1985). Whilst the relevance of the use of certain turn-taking cues for interpersonal relationships may not be readily apparent, it can be traced. Briefly, it has been found that participants do notice one anothers general communicative style, for example accent, speech rate and voice loudness, and base interpersonal evaluations on these observations (see Giles and Powesland, 1975; Giles and St. Clair, 1979). It is thus entirely possible that participants also notice each others use of turn-taking cues. In terms of the developing definition of a relationship it is possible that the fact that a participant *chooses* to mark a particular utterance using certain cues (i.e. fixed or flexible or a combination thereof) when they could have chosen otherwise, may be meaningful, reflecting their general perception and understanding of an encounter. This source of information may be particularly important in making an accurate judgement about how an interaction is developing for there could be a mismatch between how a speaker intends to manage a conversation (i.e. reflected in their use of certain 'types' and combinations of information) and how it actually proceeds (i.e. reflected in the actual patterns of turn exchange that occur). In short, it enables participants to make assessments about how an encounter is progressing without directly putting the issue on the agenda (see Wiemann, 1985). Notably other investigations of how participants handle these relational matters through the turn system have examined the role of the emerging structure of an encounter for the definition of a relationship in terms of control. Typically this has involved consideration of the use of non-fluencies; the assumption being that their strategic use can be employed to achieve certain relational goals (Wiemann, 1985) and

are not simply interactional errors as Duncan suggested. For instance, in simulated jury discussions Scherer (1979) found that American subjects (but not German) positively associated perceived influence with the initiation of simultaneous turns (as defined by Duncan, see chapter 2 of this thesis). Ferguson (1977), however, demonstrated that there was a negative association between a co-interactants assessment of dominance and the use of non-fluencies which do not involve simultaneous speech - namely silent interruptions. Clearly the different forms of non-fluencies that occur in conversation do not represent a homogeneous category of events. Whilst finally establishing the status of these various non-fluencies may require a firm understanding of how the turn system operates normally (see chapter 2), it can be seen that the inability to control a conversation is likely to have implications for social relationships.

In summary, it can be seen that the study of turn-taking is in a period of transition. Established conceptions about the kinds of turn-taking cues that operate in conversation appear to be too narrow. It seems that turn-taking cues are not always discrete for important information can be obtained from the way a particular topic is expressed and in some cases from the more general structural aspects of a turns construction. More work is needed, however, to investigate what and how other sources of contextual information are exploited to accomplish the smooth exchange of speaking turns. Work is also needed to determine the identity of the discrete cues used to regulate conversation and the factors that govern their use and the significance attributed to them. At this stage we are not yet ready for a detailed of model turn-taking. However, we have made a significant move towards an understanding of what such a model will entail.

Appendices

Appendix I

Fortran 77 programme for implementation of L-R formula

```fortran
C   specification of character variables to carry input/output file
C   names, title of output and answer to continue or quit prog
        CHARACTER*12 FNAME,FNOUT,TITLE1*50,TITLE2*50,ANSWER*1
C   specification of i-d array to carry total and type of turn exchange
        DIMENSION SN(20),SM(20),X1(20),X2(20)
C   interaction with user to find name of results output file
        PRINT*,'PLEASE TYPE NAME OF RESULTS FILE FOR OUTPUT.'
        READ(1,2)FNOUT
2       FORMAT(A12)
C   opening of output file on channel 6
        OPEN(UNIT=6,FILE=FNOUT,STATUS='MODIFY')
C   interaction to find name of data input file
5       WRITE(1,4)
4       FORMAT('PLEASE TYPE NAME OF FILE REQUIRED FOR ANALYSIS'/
       >'THE FILE NAME MUST NOT BE LONGER THAN 12 CHARACTERS'/
       >'PRESS RETURN AFTER ENTERING FILE NAME')
        READ(1,10)FNAME
10      FORMAT(A12)
;   opening of the input file on channel 5
        OPEN(UNIT=5,FILE=FNAME,STATUS='OLD')
C   reading of two 50 character lines of heading from input file
        READ(5,15)TITLE1,TITLE2
15      FORMAT(A50/A50)
C   reading of number of groups into variable g (free format)
        READ(5,*) G
C   initialisation of summation and counter variables
        SIGX1=0.0
        SIGX2=0.0
        BN1=0.0
        BN2=0.0
        I=0
        SIG1=0.0
        SIG2=0.0
        COSIG=0.0
        SSQRNM=0.0
C   loop to read, test for validity, and sum data from input file
        DO 20 K=1,G
            I=I+1
            READ(5,*)N,SN(I),X1(I),SM(I),X2(I)
            IF(SN(I).EQ.0.0.OR.SM(I).EQ.0.0) THEN
                I=I-1
                GOTO 20
            ENDIF
            BN1=BN1+SN(I)
            BN2=BN2+SM(I)
            SIGX1=SIGX1+X1(I)
20          SIGX2=SIGX2+X2(I)
C   closing of the input channel 5
        CLOSE(5)
```

```fortran
C   converting g to real and averaging events
      G=FLOAT(I)
      PHAT1=SIGX1/BN1
      PHAT2=SIGX2/BN2
C   loop to find sigma terms for sd
      DO 30 I=1,G
          SIG1=SIG1+SN(I)*(X1(I)/SN(I)-PHAT1)**2
30        SIG2=SIG2+SM(I)*(X2(I)/SM(I)-PHAT2)**2
C   finding sd for experiments 1 & 2
      SSQ1H=(1.0/(G-1.0))*SIG1
      SSQ2H=(1.0/(G-1.0))*SIG2
C   finding differential probability estimator
      PHATDF=PHAT1-PHAT2
C   loop to find sigma term for the covariance
      DO 40 I=1,G
          SSQRNM=SSQRNM+SQRT(SN(I)*SM(I))
          COSIG=COSIG+SQRT(SN(I)*SM(I))*(X1(I)/SN(I)-PHAT1)*
     >(X2(I)/SM(I)-PHAT2)
40        CONTINUE
C   finding the covariance and the final test statistic
      CHAT=(1.0/(G-1.0))*COSIG
      COSD=SQRT(SSQ1H/BN1+SSQ2H/BN2-2.0*CHAT*SSQRNM/(BN1*BN2))
      TESTST=PHATDF/COSD
C   output of the heading and the results to file on channel 6
      WRITE(6,50)TITLE1,TITLE2,PHATDF,COSD,TESTST
50    FORMAT(////'RESULTS OF:'/A50/A50/'ARE AS FOLLOWS:'/
     >'PROB. ESTIMATOR 1 - PROB. ESTIMATOR 2 = ',F10.5/
     >'ESTIMATED STANDARD DEVIATION = ',F10.5/
     >'TEST STATISTIC = ',F10.5)
C   end of output. interaction to find if another run is required
      PRINT*,'DO YOU WANT ANOTHER FILE PROCESSED ? ANSWER Y/N'
      READ(1,60)ANSWER
60    FORMAT(A1)
C   repeat from statement label 5 if answer was yes
          IF(ANSWER.EQ.'Y')GO TO 5
C   close output channel 6 and stop program if answer is no.
      CLOSE(6)
      STOP
```

Appendix II

Directory enquiry calls: a content analysis

Directory enquiry calls generally involve participants who are motivated to exchange information as efficiently as possible and yet they vary in terms of their overall success and, more notably, in length. This study examines the type of requests made and attempts to isolate the behavioural features of operators and subscribers which occur during successful, unsuccessful and very long calls. This work was motivated by practical considerations that arose through the involvement of British Telecom in this research. Specifically, it was aimed furthering our understanding of the dynamics of directory enquiry calls with the view to the possibility that this may have an input into the way operators are trained to handle more difficult and lengthy calls.

Method

This study was based on the corpus of directory enquiry calls that was compiled by Barnard (1974, see chapter 3 for further details of its collection).

The analyses was based on a sample of 716 calls that were taken from 16 complete sessions. (Session 16 was excluded as it involved the same operator as session 15.) These calls lasted for a total of 10 hours, 37 minutes; each session lasted an average of 35 minutes, 22 seconds.

Procedure. Barnard (1974) provided a transcript of all the calls but unfortunately this was inaccurate in parts and therefore the first stage of this investigation involved correcting the original transcript. Using the new transcript in conjunction with the tape recordings the calls were classified according to the type of request made. A scheme was also devised to classify the behavioural features displayed by both operators and subscribers. These categories were formulated by listening to a random selection of 150 calls.

It was found that callers made three types of requests. These involved enquiries about subscribers numbers, dialling codes and, on some occasions, the subscribers address. For example:

1. Numbers

Operator:	Directory enquiries for which town?
Subscriber:	Huntington please?
Operator:	And what's the name of the people?
Subscriber:	Elysian Holidays.
	ELYSIAN*

* Capital letters indicates that the word was spelt out

Operator:	Huntington 53060
Subscriber:	53060. Thank you very much.
Operator:	Thank you.

(Session 1, call 16)

2. Dialling Code

Operator:	...Paddock Wood 2845.
Subscriber:	Thank you very much. Can you tell me the code for Paddock Wood please?
Operator:	Yes where are you calling from?

(Session 7, call 4)

3. Address

Operator:	...Hull, yes.
Subscriber:	I'm wondering if you can do this love. It's a bit back handed. I've got the name and I know the number but I want to know the address OK?

(Session 12, call 2)

The majority of directory enquiry calls involved only one request but since some subscribers did require additional information the number of requests made per call was noted.

From Figure A.1 it can be seen that the behaviour of the subscriber was classified under three major headings: 'transmission', 'interaction' and 'knowledge'. It can also be seen that each of these main categories was comprised of several sub-categories. However, only the first two of these categories, that is transmission and interaction, were applicable to the behaviour of the operator. Examples of the behaviours classified under each of these main categories follow below:

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Figure A.1: Classification of the content of directory enquiry calls

Transmission

Repetition (see 1a)
Explicit request for
information to be
repeated

Confirmation (see 1b)
Second speaker repeated
exactly what first
speaker had said

Spelling (see 1c)
Information spelt out
in response to explicit
request

Error (see 1d)
Second speaker attempt
-ed to confirm inform
-ation but did so
incorrectly

Interaction

Third party involved
(see 2a)
Either operator
contacted another
exchange or a
second sub.
involved in call

Irrelevant information
(see 2b)
Information included that
was irrelevant to the
completion of the call

Inappropriate behaviour
(see 2c) - subscriber only
Disbelieving information
operator had given or an
inappropriate request
given the role of directory
enquiry calls

Knowledge - applies to subscriber only

Incorrect information (see 3a)
Usually about name/heading
operator should look under

Insufficient information (see 3b)
Subscriber did not have the requisite
information that the operator normal
-lly requires to carry out search

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Examples

1. *Transmission*

a. Repetition

Operator: ...Leicester 546.
Subscriber: Pardon?
Operator: Leicester 546433.
Subscriber: Thank you

(Session 14, call 7)

bi. Confirmation

Operator: ...It's a hotel, the Rutland Hotel.
Subscriber: Rutland Hotel, thank you.
                  A residential hotel?

(Session 12, call 1)

It should be noted that included in this category were instances when only part of the letter or word were reproduced by the second speaker.

bii.

Subscriber: ...Cranfield, Wheeler and Davies solicitors.
Operator: Cranfield.
Subscriber: Wheeler and Davies please.
Operator: Wheeler and Davies.

(Session 2, call 40)

c. Spelling

Operator: ...Seaton how are you spelling Seaton?
Subscriber: SEATON

(Session 6, call 11)

d. Error

Subscriber: ...That's it. 27, Throckmorton Street.
Operator: 24?
Subscriber: 27, Throckmorton Street?

(Session 11, call 15)

2. *Interaction*

a. Third person involved

Operator 2:   ...OK Thanks.
Subscriber: Excuse me. The first letter is D for daughter.

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Operator1:   D for dog.

(Session 1, call 5)

b. Irrelevant information

Operator: ...Yes sorry. What did you say?
Subscriber: My walking stick. I'm
                crippled person, oh dear! Could you give me PYE, St.
                Andrew's Road, please.

(Session 17, call 53)

ci. Inappropriate behaviour

Operator: ...but I- I haven't got anything listed.
Subscriber: They would hardly be
                ex-directory would they?
Operator: Sorry?
Subscriber: They'd hardly be
                ex-directory. Not a place like...

(Session 9, call 22)

cii.

Operator: Yes well that's all I have got a telephone directory.
Subscriber: Oh!
Operator: You really want a street list don't you? We don't have
                them.
Subscriber: Yes, well I mean yes...

(Session 9, call 22)

3. *Knowledge*

a. Incorrect Information

Operator: ...I'm sorry I have nothing listed under East Anglian
                Newspaper Limited.
Subscriber: Could it be under Eastern Newspaper?
                Would it?
Operator: Eastern Newspaper?
Subscriber: Yes.
Operator: No I have nothing under

Eastern Newspapers...

(Session 2, call 25)

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b. Insufficient information

Subscriber:	16 Newton Road. Any chance of finding it through you or not?
Operator:	Well not really you haven't got the name of the people who own this because it'll probably come under their name.
Subscriber:	No I'm sorry I don't.

(Session 14, call 16)

It should be noted that a record was also made of whether or not the call was successful. This was operationally defined as follows:

A. *Successful* - if the subscriber either obtained the information they originally asked for or the operator gave a different but satisfactory substitute:

i.

Subscriber:	Bournemouth.
Operator:	May I have the name of the people please?
Subscriber:	Teachers Assurance Company Limited.
Operator:	The numbers Bournemouth 29111.
Subscriber:	Yes.
Operator:	Thank you.

(Session 10, call 55)

ii. The next example is not as straightforward. On this occasion the subscriber called directory enquiry service under the misapprehension that changes in address should be reported to the operator. As this is not part of the function of this service, the operator referred them to the correct number.

Subscriber:	Oh could I make an alteration in the directory dear? For next year?
Operator:	Umm one moment... Hello I should dial Cambridge 58885, the telephone manager's office and they'll be able to help you from there.

(Session 12, call 41)

B. *Unsuccessful* - when the operator could not help the subscriber at all or the call was cut off prematurely:

i.

Operator:	Mmm well it comes in two directories and I've looked in both of them but there's nothing listed.
Subscriber:	Oh! OK then.

(Session 14, call 9)

ii. Operator: ...if you'd just like to hold the line.
Subscriber: I see. Thank you very much.

(Operator dials other exchange, 219 seconds lapses before the next words are uttered to the subscriber.)

Operator: Hello, hello. This man's just gone.

(Session 4, call 7)

Inter-observer reliability between the author and an independent judge in applying this scheme was 97%, Kappa=0.94, The test re-test reliability was 98%. It should be noted that inter-observer reliability ranged from 100% for classifying type of request to 84% for identifying the features of the knowledge category. Inter-observer reliability and the test re-test reliability in classifying the success of a call was 100% . Reliability was calculated on the basis of a sample of 40 calls.

Each call was timed with an electronic counter from the begining of the first utterance to the last word. The sex of the subscriber was noted[1].

The characteristics of each call were coded and put onto a main frame computer. A complex sorting computer programme was then written in Fortran 77 by the author.

Results

A.1. The content of an average directory enquiry call

Type of requests

Of the 793 enquiries, 88% were requests for numbers[2], 10% requests for codes and 2% were requests for addresses. There was an average of 1.1 requests made per call.

---

1. It should be noted that four calls that involved children were excluded from this analyses since, perhaps not surprisingly, they often did not provide the information efficiently or accurately. In two cases an adult intervened to ensure the successful completion of the call.
2. This includes requests for numbers that were new and numbers that had changed (this comprised 10% and 1%, respectively of the total number of enquiries made).

It should be noted that female and male subscribers did not differ in either the type or number of requests made.

The behavioural categories

It was found that out of the three categories of behaviours identified those involving the *transmission* category occurred most frequently, with a mean frequency of 3.6 times per call. In contrast, behaviours that were classified under the *interaction* and *knowledge* categories occurred with a mean frequency of 0.130 and 0.169, respectively per call.

a) Transmission

From Table A.1 it can be seen that within this category operators and subscribers (both females and males) used confirmation most frequently, followed by spelling and repetition. Errors in the transmission of information were comparatively uncommon. It should be noted that 87% of all errors were contributed by operators. There was, however, considerable variation between operators in the frequency with which such errors occurred.

b) Interaction

Behaviours classified under this category were used more frequently by subscribers than operators (see Table A.1). It was found that operators and subscribers also differed in the frequency with which the component behaviours of this category were used (see Table A.1 for further details of the rank ordering of these behaviours). There were no differences between female and male subscribers in the use of these behaviours within the interaction category.

c) Knowledge

In this category (which of course only applied to subscribers behaviour) it was found that most of the problems were caused by instances when the subscriber had

Table A.1: Mean frequency per call of *transmissional, interactional* and *knowledge* based features

Behaviours	Operators	Subscribers
Transmission	2.099	1.518
Repetition	0.247	0.195
Confirmation	1.308	0.814
Spelling	0.438	0.494
Error	0.105	0.016
Interaction	0.018	0.112
Third party involved	0.016	0.014
Irrelevant	0.002	0.041
Inappropriate	-	0.056
Knowledge	-	0.169
Insufficient	-	0.124
Incorrect	-	0.041

insufficient information, as opposed to information that was incorrect (see Table A.1). There were no sex differences.

A.2. The Nature of Successful and Unsuccessful Calls

The next stage of the analyses was aimed at determining the number and type of requests made and the behavioural features that occurred during successful and unsuccessful directory enquiry calls.

It was found that 84% of calls were successfully completed and the remaining 16% were unsuccessful. There were no differences between females and males in the number of successful calls made. It was found that those calls that were unsuccessful on average lasted considerably longer than successful ones (89.6 seconds and 53.7 seconds, respectively). The mean frequency of requests per successful call was 1.2 and for unsuccessful calls was 0.9

<u>The behavioural categories</u>

It was found that the mean frequency of *transmission* behaviours per successful call was 3.50 compared with 0.115 and 0.112 for *interactional* and *knowledge* features, respectively. The mean frequency of the *transmission, interactional* and *knowledge* based behaviours in unsuccessful calls was slightly different - 3.83, 0.184 and 0.393, respectively.

a) Transmission

From Table A.2 it can be seen that compared with successful calls, when an operator was involved in an unsuccessful call they increased the amount they repeated and spelt out information. Subscribers also increased the frequency with which they repeated and spelt out information. Interestingly, for the subscriber these changes were accompanied by a notable decrease in the frequency with which they confirmed information. Somewhat surprisingly no errors were observed. These trends were maintained for both female and male subscribers.

b) Interaction

It was found that for operators interactional behaviours occurred with a mean frequency of 0.020 during successful calls and 0.07 during unsuccessful calls. The relative increase in the use of behaviours classified under this category during successful calls was attributable to frequency with which operators contacted another exchange (this occurred with a mean frequency of 0.019 per successful call but occurred on no occasions during unsuccessful calls). For subscribers there were also differences between successful and unsuccessful calls in the mean frequency of interactional behaviours. During successful calls, the mean frequency per call of interactional behaviours was 0.09 and for unsuccessful calls 0.178. These differences resulted from a decrease in the frequency with which irrelevant information was included and inappropriate behaviour occurred during successful calls (the inclusion of irrelevant behaviour occurred with a mean frequency of 0.038 in successful calls and 0.053 in unsuccessful calls, and for inappropriate behaviour the corresponding mean frequencies per call were 0.039 to 0.125, respectively).

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Table A.2:   Successful and unsuccessful calls;   mean frequency per call of the subcomponents of the transmission category

| Type of call | Transmission Category | | | |
	Repeat	Confirm	Spelling	Errors
Operators				
Successful	0.201	1.28	0.340	0.097
Unsuccessful	0.479	1.29	0.865	0.157
Subscribers				
Successful	0.185	0.957	0.426	0.018
Unsuccessful	0.253	0.006	0.796	0.000

c) Knowledge

It was found that in successful calls the mean frequency per call of knowledged-based problems was 0.12 and for unsuccessful calls it was 0.40. This resulted from the fact that in unsuccessful calls there were more instances where the subscriber had insufficient knowledge.

A.3. A Content Analysis of all the calls longer than 200 seconds

There were only twelve calls that conformed to this criteria. Four of these calls were successfully completed (of these 3 involved female subscribers and 1 involved a male subscriber).

<u>Type of requests</u>

Of the requests made 79% were enquiries for numbers and 21% involved requests for codes. It should be, however, noted that 29% of the enquiries for numbers involved requests for new numbers.

<u>The behavioural categories</u>

It was found that in very long calls behaviours that were classified under the transmission category occurred more frequently than either of the other two types. The relative frequency of these behaviours was comparable to the those found in an average call.

a) Transmission

It was found that compared with an average call (see Table A.1) in these very long calls there was a 23% increase in the frequency with which operators requested information to be spelt out and an 18% decrease in the level with which they confirmed information. There were also differences in the subscribers behaviours. In the long calls it was found that subscribers increased the frequency with which they spelt out and repeated information by 31% and 9%, respectively. This was accompanied by a 40% decrease in subscribers confirmation.

b) Interaction

Unfortunately, in the interaction category for operators and subscribers the total frequencies were so low it was not possible to analyse this data.

c) Knowledge

Knowledge-based problems featured in six of the calls and, importantly, they all involved instances when the subscriber had insufficient knowledge.

<u>Conclusions</u>

1. Directory enquiry calls are highly variable in length; they range from 7 seconds to 293 seconds.

2. The majority of directory enquiry calls involved requests for numbers followed by requests for codes (10%), and lastly requests for addresses (1%).

3. The vast majority of directory enquiry calls were successful, 83.7% and the remaining 16.3% were unsuccessful.

4. Unsuccessful calls lasted longer (89.6 seconds) than successful calls which lasted for an average of 53.7 seconds.

5. Unsuccessful calls and the very long calls in the corpus did not involve more requests than successful calls.

6. Unsuccessful calls did not differ from successful calls in terms of the types of requests made.

7. Very long calls involved relatively fewer requests for numbers (50%) and comparatively more requests for addresses (29%) and codes (21%) than shorter calls.

8. Unsuccessful calls were four times more likely to involve a subscriber with inadequate knowledge than successful calls. It should perhaps be pointed out that it was inadequate knowledge (that is to say, insufficient knowledge) rather than incorrect information which was at fault here.

9. The amount of irrelevant information introduced by subscribers into a call did not differentiate successful and unsuccessful calls (it occurred approximately 1 in every 25 calls).

10. Interestingly, and counter-intuitively, the frequency of errors by either operators or subscribers did not differentiate successful and unsuccessful calls. Indeed, in the case of errors in unsuccessful calls this dropped to zero (compared with a mean frequency of 0.018 in successful calls).

11. The features that did tend to distinguish successful and unsuccessful calls were those relating to the *transmission* category. The most striking single feature was that in successful directory enquiry calls subscribers tended to confirm what the operator was saying (confirmation was an important part of the transmission category) but in unsuccessful calls the subscriber did not confirm information in this way. Confirmation was 160 times more common in successful than unsuccessful calls. None of the other features in this category showed such striking variation.

12. In terms of operator behaviour the specific feature that distinguished successful and unsuccessful calls here was the greater number of requests for repetitions and spellings during successful calls. Less confirmation and more requests for confirmations, repetition and spelling occurred in unsuccessful than successful calls. In other words, it was not that the operator was taking less care in unsuccessful calls, rather they were going to great lengths to elicit the necessary information and check that they had got it right, that is by repeating and spelling the information transmitted.

Appendix III

BASIC randomisation programme

```
5    DIM ARR(144)
10   FOR I=1 TO 144
15   ARR(I)=999
20   NEXT I
25   S=0.0
30   N=INT(RND(0)*144+1)
35   FOR I=1 TO S
40   IF N=ARR(I) THEN 20
45   NEXT I
50   S=S+1
55   ARR(S)=N
60   IF S<144 THEN 20
65   FOR I=1 TO 144
70   PRINT I, ARR(I)
75   NEXT I
80   STOP
```

Appendix IV

Raw data for the analyses carried out in chapter 4

Table B.1: Relationship between number of turn-yielding cues conjointly displayed and smooth speaker-switches in agreement and disagreement (no attempt-suppression signal displayed)

Number of turn-yielding cues conjointly displayed	Frequency of smooth speaker-switches at junctures with different number of cues displayed							% of total smooth switches
	Groups							
	1	2	3	4	5	6	Total	
Agreement								
0	0	0	0	0	1	2	3	1.8
1	2	1	2	1	7	3	16	9.6
2	10	25	21	8	19	18	101	60.5
3	7	6	3	4	6	13	39	23.4
4	1	1	0	1	4	1	8	4.8
5	0	0	0	0	0	0	0	0
Total	20	33	26	14	37	37	167	100.0
Disagreement								
0	0	0	0	0	0	0	0	0
1	0	0	1	1	2	2	6	6.0
2	4	11	12	13	11	9	60	60.0
3	3	5	4	4	5	9	30	30.0
4	3	0	0	0	0	1	4	4.0
5	0	0	0	0	0	0	0	0
Total	10	16	17	18	18	21	100	100.0

Table B.2a: Relationship between number of turn-yielding cues conjointly displayed and overlaps in *agreement* (no attempt-suppression signal displayed)

Number of turn-yielding cues conjointly displayed	Groups						Total	% of total overlaps
	1	2	3	4	5	6		
Initiation of simultaneous speech								
0	1	11	2	6*	7**	8	35	85.4
1	0	0	0	1	2	0	3	7.3
2	0	0	2	0	0	0	2	4.9
3	0	0	1	0	0	0	1	2.4
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
Total	1	11	5	7	9	8	41	100.0
Termination of simultaneous speech								
0	0	0	0	0	0	0	0	0
1	0	0	0	0	1	0	1	2.2
2	1	9	5	5	7	7	34	75.6
3	0	2	0	3	3	1	9	20.0
4	0	0	0	0	1	0	1	2.2
5	0	0	0	0	0	0	0	0
Total	1	11	5	8	12	8	45	100.0

* In addition, 1 overlap was initiated when the speaker was not displaying any turn-yielding cues but was gesticulating.

** In this group there were 3 instances when the speaker was not displaying any turn-yielding cues but was gesticulating.

Table B.2b: Relationship between number of turn-yielding cues conjointly displayed and overlaps in *disagreement* (no attempt-suppression signal displayed)

Number of turn-yielding cues conjointly displayed	Frequency of overlaps at junctures with different number of cues displayed							
	Groups							% of total
	1	2	3	4	5	6	Total	overlaps
Initiation of simultaneous speech								
0	9	4	3	15	0	14	45	90.0
1	1	0	0	0	0	0	1	2.0
2	0	1	0	0	1	2	4	8.0
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
Total	10	5	3	15	1	16	50	100.0
Termination of simultaneous speech								
0	0	0	0	1	0	0	1	2.0
1	0	1	0	2	1	0	4	8.0
2	6	3	2	12	0	11	34	68.0
3	4	1	1	0	0	2	8	16.0
4	0	0	0	0	0	3	3	6.0
5	0	0	0	0	0	0	0	0
Total	10	5	3	15	1	16	50	100.0

Table B.3a: Relationship between number of turn-yielding cues conjointly displayed and simple interruptions in *agreement* (no attempt-suppression signal displayed)

Number of turn-yielding cues conjointly displayed	Frequency of simple interruptions at junctures with different number of cues displayed							% of total simple interruptions
	Groups							
	1	2	3	4	5	6	Total	
Initiation of simultaneous speech								
0	1	3	3	2	1	4	14	63.7
1	1	0	1	0	1	0	3	13.6
2	1	1	1	0	0	1	4	18.2
3	0	0	0	0	0	1	1	4.5
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
Total	3	4	5	2	2	6	22	100.0
Termination of simultaneous speech								
0	1	5	5	3	1	6	21	95.5
1	1	0	0	0	0	0	1	4.5
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
Total	2	5	5	3	1	6	22	100.0

Table B.3b: Relationship between number of turn-yielding cues conjointly displayed and simple interruptions in *disagreement* (no attempt-suppression signal displayed)

Number of turn-yielding cues conjointly displayed	Frequency of simple interruptions at junctures with different number of cues displayed							% of total simple interruptions
	Groups						Total	
	1	2	3	4	5	6		
Initiation of simultaneous speech								
0	2	5	3	4	0	4	18	90.0
1	0	0	0	0	1	0	1	5.0
2	0	1	0	0	0	0	1	5.0
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
Total	2	6	3	4	1	4	20	100.0
Termination of simultaneous speech								
0	2	5	2	5	2	4	20	83.3
1	0	0	0	1	0	0	1	4.2
2	0	1	0	0	1	0	2	8.3
3	0	0	0	0	0	1	1	4.2
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
Total	2	6	2	6	3	5	24	100.0

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Table B.4a: Relationship between number of turn-yielding cues conjointly displayed and simple interruptions in *agreement* (with attempt-suppression signal displayed)

Number of turn-yielding cues conjointly displayed	Frequency of simple interruptions at junctures with different number of cues displayed							% of total simple interruptions
	Groups							
	1	2	3	4	5	6	Total	
Initiation of simultaneous speech								
0	0	1	0	0	3	2	6	75.0
1	0	0	0	2	0	0	2	25.0
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
Total	0	1	0	2	3	2	8	100.0
Termination of simultaneous speech								
0	1	0	0	0	4	2	7	87.5
1	0	0	0	0	0	0	0	0
2	0	0	0	1	0	0	1	12.5
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
Total	1	0	0	1	4	2	8	100.0

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Table B.4b: Relationship between number of turn-yielding cues conjointly displayed and simple interruptions in *disagreement* (with attempt-suppression signal displayed)

Number of turn-yielding cues conjointly displayed	Frequency of simple interruptions at junctures with different number of cues displayed Groups						Total	% of total simple interruptions
	1	2	3	4	5	6		
Initiation of simultaneous speech								
0	2	0	0	2	3	3	10	91.0
1	0	0	0	0	1	0	1	9.0
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
Total	2	0	0	2	4	3	11	100.0
Termination of simultaneous speech								
0	2	0	1	0	1	2	6	85.7
1	0	0	0	0	0	0	0	0
2	0	0	0	0	1	0	1	14.3
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0 ·	0	0	0
5	0	0	0	0	0	0	0	0
Total	2	0	1	0	2	2	7	100.0

Table B.5: Relationship between number of turn-yielding cues conjointly displayed and silent interruptions in agreement and disagreement (no attempt-suppression signal displayed)

Number of turn-yielding cues conjointly displayed	Frequency of silent interruptions at junctures with different number of cues displayed							
	Groups							% of total silent interruptions
	1	2	3	4	5	6	Total	
Agreement								
0	0	2	1	0	0	0	3	60.0
1	0	0	0	0	1	1	2	40.0
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
Total	0	2	1	0	1	1	5	100.0
Disagreement								
0	1	4	3*	2	1*	1*	12	75.0
1	1	0	0	0	1*	0	2	12.5
2	0	0*	1	0	0	1	2	12.5
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
Total	2	4	4	2	2	2	16	100.0

* Indicates that in addition a silent interruption occurred whilst the speaker was gesticulating

Table B.6: Frequency individual turn-yielding cues displayed at smooth speaker-switches in agreement and disagreement (no attempt-suppressing signal displayed)

| Turn-yielding cues | Frequency of smooth speaker-switches marked by each cue | | | | | | | % of smooth switches |
| | Groups | | | | | | | |
	1	2	3	4	5	6	Total	
Agreement								
Clause	20	33	25	14	32	30	153	91.6
Socio.seq.	0	0	0	0	1	4	5	2.9
Intonation	18	32	24	12	29	33	148	88.6
Gest. term.	7	3	2	4	9	10	35	21.0
Drawl	2	6	2	3	8	5	26	15.6
Disagreement								
Clause	9	15	17	18	16	19	95	95.0
Socio.seq.	1	0	0	0	0	2	3	3.0
Intonation	10	16	16	17	17	20	96	96.0
Gest. term.	6	3	2	1	3	7	22	22.0
Drawl	4	3	2	3	3	4	19	19.0

Table B.7a: Frequency individual turn-yielding cues displayed at overlaps in *agreement* (no attempt-suppressing signal displayed)

Turn-yielding cues	Frequency of overlaps marked by each cue							
	Groups							% of
	1	2	3	4	5	6	Total	overlaps
Initiation of simultaneous speech								
Clause	0	0	2	1	0	0	3	6.7
Socio.seq.	0	0	0	0	0	0	0	0
Intonation	0	0	3	0	0	0	3	6.7
Gest. term.	0	0	1	0	2	0	3	6.7
Drawl	0	0	1	0	0	0	1	2.2
Termination of simultaneous speech								
Clause	1	11	5	8	12	8	45	100.0
Socio.seq.	0	0	0	0	0	0	0	0
Intonation	1	11	5	8	11	8	44	97.8
Gest. term.	0	1	0	3	3	1	8	17.8
Drawl	0	1	0	0	2	0	3	6.7

Table B.7b: Frequency individual turn-yielding cues displayed at overlaps in *disagreement* (no attempt-suppressing signal displayed)

Turn-yielding cues	Frequency of overlaps marked by each cue Groups						Total	% of overlaps
	1	2	3	4	5	6		
Initiation of simultaneous speech								
Clause	0	1	0	0	1	2	4	8.0
Socio.seq.	0	0	0	0	0	0	0	0
Intonation	0	1	0	0	1	2	4	8.0
Gest. term.	0	0	0	0	0	0	0	0
Drawl	0	0	0	0	0	0	0	0
Termination of simultaneous speech								
Clause	10	4	3	13	0	16	46	92.0
Socio.seq.	0	0	0	0	1	0	1	2.0
Intonation	10	5	3	13	0	16	47	94.0
Gest. term.	4	1	0	0	0	5	10	20.0
Drawl	0	0	1	0	0	3	4	8.0

Table B.8a: Frequency individual turn-yielding cues displayed at simple interruptions in *agreement* (no attempt-suppressing signal displayed)

| Turn-yielding cues | Frequency of simple interruptions marked by each cue | | | | | | | % of simple interruptions |
| | Groups | | | | | | | |
	1	2	3	4	5	6	Total	
Initiation of simultaneous speech								
Clause	2	1	1	0	0	1	5	22.7
Socio.seq.	0	0	0	0	0	1	1	4.6
Intonation	0	1	2	0	0	2	5	22.7
Gest. term.	1	0	0	0	0	1	2	9.1
Drawl	0	0	0	0	0	0	0	0
Termination of simultaneous speech								
Clause	1	0	0	0	0	0	1	4.6
Socio.seq.	0	0	0	0	0	0	0	0
Intonation	0	0	0	0	0	0	0	0
Gest. term.	0	0	0	0	0	0	0	0
Drawl	0	0	0	0	0	0	0	0

Note:

The display of the attempt-suppression cue was rarely accompanied by turn-yielding cues. However, listed below are the cue combinations that did occur conjointly with gesticulation:

a) the initiation of simultaneous speech - on two occasions in group 4 there was also clause completion.

b) the termination of simultaneous speech - on one occasion in group 4 there was clause completion and a change in intonation, in addition to gesticulation.

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Table B.8b: Frequency individual turn-yielding cues displayed at simple interruptions in *disagreement* (no attempt-suppressing signal displayed)

Turn-yielding cues	Frequency of simple interruptions marked by each cue							% of simple interruptions
	Groups							
	1	2	3	4	5	6	Total	
Initiation of simultaneous speech								
Clause	0	1	0	0	1	0	2	10.0
Socio.seq.	0	0	0	0	0	0	0	0
Intonation	0	1	0	0	0	0	1	5.0
Gest. term.	0	0	0	0	0	0	0	0
Drawl	0	0	0	0	0	0	0	0
Termination of simultaneous speech								
Clause	0	1	0	1	0	1	3	12.5
Socio.seq.	0	0	0	0	1	0	1	4.2
Intonation	0	1	0	0	1	1	3	12.5
Gest. term.	0	0	0	0	0	0	0	0
Drawl	0	0	0	0	0	1	1	4.2

Note:

The display of the attempt-suppression cue was rarely accompanied by turn-yielding cues. However, listed below are the cue combinations that did occur conjointly with gesticulation:

a) the intiation of simultaneous speech - on one occasions in group 5 there was also clause completion.

b) the termination of simultaneous speech - on one occasion in group 5 there was clause completion and a change in intonation, in addition to gesticulation.

Table B.9: Frequency individual turn-yielding cues displayed at silent interruptions in agreement and disagreement (no attempt-suppressing signal displayed)

Turn-yielding cues	Frequency of silent interruptions marked by each cue							% of silent interruptions
	Groups							
	1	2	3	4	5	6	Total	
Agreement								
Clause	0	0	0	0	0	1	1	20.0
Socio.seq.	0	0	0	0	1	0	1	20.0
Intonation	0	0	0	0	0	0	0	0
Gest. term.	0	0	0	0	0	0	0	0
Drawl	0	0	0	0	0	0	0	0
Disagreement								
Clause	1	0	0	0	0	1	2	12.5
Socio.seq.	0	0	0	0	0	0	0	0
Intonation	0	0	1	0	0	1	2	12.5
Gest. term.	0	0	0	0	0	0	0	0
Drawl	0	0	1	0	0	0	1	6.3

Note:

In disagreement in group 2 on one occasion the attempt-suppressing cue occurred in conjunction with clause completion and intonation and in group 5 on one occasion it occurred in conjunction with sociocentric sequence.

Table B.10: Speakers direction of gaze at smooth speaker-switches

Direction of gaze	Frequency of smooth speaker-switches Groups						Total	% smooth switches
	1	2	3	4	5	6		
Agreement								
First speaker	3	2	7	3	9	4	28	16.8
Next speaker	8	12	3	5	10	9	47	28.1
First=second	1	4	8	2	15	17	47	28.1
Other	5	8	2	3	2	5	25	15.0
None	3	7	6	1	1	2	20	12.0
Disagreement								
First speaker	4	2	1	3	2	2	14	14.0
Next speaker	2	5	2	7	7	7	30	30.0
First=second	1	3	11	5	4	9	33	33.0
Other	0	2	2	1	2	3	10	10.0
None	3	4	1	2	3	0	13	13.0

Note: For those smooth speaker-switches that involved a shift in gaze its direction after the change is recorded in this table.

Table B.11: Relationship between number of turn-yielding cues conjointly displayed and turn-medial utterances in agreement and disagreement

Number of turn-yielding cues conjointly displayed	Frequency of turn-medial at junctures with different number of cues displayed							% of total turn medial
	Groups						Total	
	1	2	3	4	5	6		
Agreement								
0	0	0	0	0	0	0	0	0
1	12	8	5	5	2	17	49	31.8
2	13	19	16	10	5	32	95	61.7
3	0	2	1	2	2	3	10	6.5
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
Total	25	29	22	17	9	52	154	100.0
Disagreement								
0	0	0	0	0	0	0	0	0
1	11	9	2	12	9	8	51	42.8
2	9	16	3	12	13	6	59	49.6
3	2	3	1	0	1	2	9	7.6
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
Total	22	28	6	24	23	16	119	100.0

Table B.12: Frequency individual turn-yielding cues displayed at turn-medial utterances in agreement and disagreement

Turn-yielding cues	Frequency of turn-medial utterances marked by each cue							% of turn medials
	Groups							
	1	2	3	4	5	6	Total	
Agreement								
Clause	24	28	22	17	7	52	150	97.4
Socio.seq.	0	1	0	0	2	0	3	1.9
Intonation	11	18	11	9	4	16	69	44.8
Gest. term.	2	1	2	1	2	5	13	8.4
Drawl	1	4	5	4	3	17	34	22.1
Disagreement								
Clause	19	27	6	24	23	16	115	96.6
Socio.seq.	3	1	0	0	0	0	4	3.4
Intonation	6	13	1	5	6	6	37	31.1
Gest. term.	2	3	1	1	3	1	11	9.2
Drawl	5	6	3	6	6	3	29	24.4

Table B.13: Speakers direction of gaze at turn-medial utterances

Direction	Frequency of turn-medial utterances							% of turn
	Groups							
of gaze	1	2	3	4	5	6	Total	medials
Agreement								
First speaker	17	9	16	0	3	17	62	40.3
Next speaker	1	4	0	5	3	1	14	9.1
First=second	0	0	0	6	2	27	35	22.7
Other	6	6	1	6	1	2	22	14.3
None	1	10	5	0	0	5	21	13.6
Disagreement								
First speaker	11	12	1	3	0	0	29	24.4
Next speaker	2	1	1	8	0	5	17	14.3
First=next	2	1	2	8	15	10	36	30.3
Other	0	4	1	6	4	0	15	12.6
None	7	10	1	0	3	1	22	18.5

Table B.14a: Frequency of speaker-switches marked by the display of speaker-state cues in *agreement*

Type of cue	Frequency of turn beginings marked by speaker-state cues							
	Groups							% of total
	1	2	3	4	5	6	Total	of switch
Smooth speaker-switches								
Gesticulation	0	0	0	2	4	5	11	6.6
Shift in gaze	1	7	1	0	4	2	15	8.9
Both	0	0	0	1	1	1	3	1.8
Overlaps								
Gesticulation	0	0	0	1	2	0	3	6.7
Shift in gaze	0	1	1	1	2	1	6	13.3
Both	0	0	0	0	0	1	1	2.2
Simple interruptions								
Gesticulation	0	0	0	0	1	1	2	6.7
Shift in gaze	0	1	0	0	0	2	3	10.0
Both	0	0	0	0	1	0	1	3.3
Silent interruptions								
Gesticulation	-	0	0	-	0	0	0	0
Shift in gaze	-	0	0	-	0	0	0	0
Both	-	0	0	-	0	0	0	0

Note: '-' indicates that particular exchange did not occur in that group.

Table B.14b: Frequency of speaker-switches marked by the display of speaker-state cues in *disagreement*

Type of cue	Frequency of turn beginings marked by speaker-state cues							
	Groups							% of total
	1	2	3	4	5	6	Total	of switch
Smooth speaker-switches								
Gesticulation	1	0	1	2	6	5	15	15.0
Shift in gaze	3	4	2	1	1	1	12	12.0
Both	1	0	0	0	0	0	1	1.0
Overlaps								
Gesticulation	6	1	0	2	0	3	12	24.0
Shift in gaze	1	2	1	1	1	3	9	18.0
Both	0	0	0	1	0	0	1	2.0
Simple interruptions								
Gesticulation	1	1	0	1	1	3	7	22.6
Shift in gaze	0	1	0	0	0	1	2	6.5
Both	0	0	1	1	0	0	2	6.5
Silent interruptions								
Gesticulation	0	0	2	1	2	0	5	23.8
Shift in gaze	0	3	1	0	0	0	4	19.6
Both	0	0	0	0	0	0	0	0

Table B.15: Relationship between number of turn-yielding cues conjointly displayed and smooth speaker-switches during directory enquiry calls

Number of turn-yielding cues conjointly displayed	Frequency of smooth speaker-switches at junctures with different number of cues displayed Groups															Total	% of total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
Operator-subscriber																	
0	0	1	0	0	1	0	0	0	1	0	1	0	1	0	0	5	5.3
1	2	1	5	3	3	0	4	1	3	1	2	1	4	5	4	39	41.0
2	5	3	10	1	4	4	2	2	2	3	1	2	2	5	4	50	52.6
3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.1
Total	8	5	15	4	8	4	6	3	6	4	4	3	7	10	8	95	100.0
Subscriber-operator																	
0	1	1	0	0	0	0	0	1	1	1	1	0	0	0	0	6	7.0
1	3	2	4	0	3	1	2	2	2	0	1	1	5	6	5	37	43.0
2	6	2	9	1	4	3	2	1	3	3	3	2	2	1	1	43	50.0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	10	5	13	1	7	4	4	4	6	4	4	3	7	7	6	86	100.0

Table B.16: Frequency of individual turn-yielding cues displayed at smooth speaker-switches during directory enquiry calls.

| Turn-yielding cues | Frequency of smooth speaker-switches marked by each cue | | | | | | | | | | | | | | | | % of |
| | Groups | | | | | | | | | | | | | | | | |
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total	Total
Operator-subscriber																	
Clause	7	3	12	1	4	4	2	2	3	3	2	2	2	5	3	55	57.9
Socio.seq.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Intonation	4	3	12	4	5	2	4	3	4	3	1	3	4	8	7	67	70.5
Drawl	4	1	1	0	2	2	2	0	0	1	1	0	2	2	2	20	21.1
Subscriber-operator																	
Clause	8	3	9	1	7	4	3	2	5	3	4	3	3	4	3	62	72.1
Socio.seq.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1.2
Intonation	7	2	10	1	3	2	1	1	2	2	2	2	3	4	2	44	51.2
Drawl	0	1	1	0	1	1	2	1	1	1	1	0	3	0	2	15	17.4

Table B.17: Relationship between number of turn-yielding cues conjointly displayed and smooth speaker-switches during travel enquiry calls

a) Operator A's session

Number of turn-yielding cues conjointly displayed: Frequency of smooth speaker-switches at junctures with different number of cues displayed

Number of turn-yielding cues conjointly displayed	Groups												Total	% of total
	1	2	3	4	5	6	7	8	9	10	11	12		
Operator-subscriber														
0	0	1	1	0	1	0	0	1	0	0	0	2	6	7.7
1	3	0	0	1	5	2	3	2	3	2	1	2	24	30.8
2	4	1	3	8	1	6	4	5	3	2	4	2	43	55.1
3	0	1	0	1	0	1	0	2	0	0	0	0	5	6.4
Total	7	3	4	10	7	9	7	10	6	4	5	6	78	100.0
Subscriber-operator														
0	1	1	0	0	0	2	1	0	0	0	0	0	5	9.0
1	3	0	0	2	1	2	1	1	2	3	0	3	18	32.1
2	2	1	2	6	3	4	3	3	1	1	4	2	32	57.1
3	1	0	0	0	0	0	0	0	0	0	0	0	1	1.8
Total	7	2	2	8	4	8	5	4	3	4	4	5	56	100.0

Table B.17: Relationship between number of turn-yielding cues conjointly displayed and smooth speaker-switches during travel enquiry calls continued

b) Operator B's session

Number of turn-yielding cues conjointly displayed	Frequency of smooth speaker-switches at junctures with different number of cues displayed — Groups													% of
	1	2	3	4	5	6	7	8	9	10	11	12	Total	total
Operator-subscriber														
0	0	0	0	1	0	1	0	0	1	2	2	0	7	7.4
1	1	0	4	4	1	1	1	3	7	5	3	1	31	33.0
2	1	2	5	5	2	2	5	2	10	5	2	6	47	50.0
3	0	0	2	0	2	0	0	1	2	0	2	0	9	9.6
Total	2	2	11	10	5	4	6	6	20	12	9	7	94	100.0
Subscriber-operator														
0	0	0	1	2	1	0	2	0	3	2	1	0	12	14.5
1	0	0	5	1	2	1	3	2	8	3	3	1	29	34.9
2	3	1	6	4	2	2	4	1	6	4	3	4	40	48.2
3	1	0	0	0	0	0	0	0	0	1	0	0	2	2.4
Total	4	1	12	7	5	3	9	3	17	10	7	5	83	100.0

Table B.17: Relationship between number of turn-yielding cues conjointly displayed and smooth speaker-switches during travel enquiry calls continued

c) Operator C's session

| Number of turn-yielding cues conjointly displayed | Frequency of smooth speaker-switches at junctures with different number of cues displayed | | | | | | | | | | | | | % of |
| | Groups | | | | | | | | | | | | | |
	1	2	3	4	5	6	7	8	9	10	11	12	Total	total
Operator-subscriber														
0	0	0	0	2	0	0	0	4	0	0	0	0	6	5.2
1	7	5	2	1	1	2	1	3	9	2	4	4	41	35.3
2	7	3	3	1	1	3	7	4	14	3	8	5	59	50.9
3	1	0	0	1	0	1	1	0	1	1	3	1	10	8.6
Total	15	8	5	5	2	6	9	11	24	6	15	10	116	100.0
Subscriber-operator														
0	2	0	0	0	0	2	0	0	3	0	1	0	8	9.4
1	6	1	2	3	0	0	1	2	7	1	4	2	29	34.1
2	3	4	2	2	1	2	7	2	6	2	8	5	44	51.8
3	1	1	0	0	0	0	1	0	0	1	0	0	4	4.7
Total	12	6	4	5	1	4	9	4	16	4	13	7	85	100.0

Table B.18: Frequency of individual turn-yielding cues displayed at smooth speaker-switches during travel enquiry calls

Turn-yielding cues	Frequency of smooth speaker-switches marked by each cue													
	Groups													% of
	1	2	3	4	5	6	7	8	9	10	11	12	Total	total
Operator A-subscriber														
Clause	6	2	3	9	1	8	6	8	3	3	5	3	57	73.1
Intonation	5	2	2	9	5	7	4	7	4	1	4	3	53	67.9
Drawl	0	1	1	2	1	2	1	3	2	2	0	0	15	19.2
Subscriber-operator A														
Clause	4	1	2	7	3	5	3	4	2	3	4	3	41	73.2
Intonation	5	0	2	7	4	5	4	3	2	2	4	4	42	75.0
Drawl	1	1	0	0	0	0	0	0	0	0	0	0	2	3.6
Operator B-subscriber														
Clause	2	2	11	8	5	3	5	3	15	4	5	6	69	73.4
Intonation	1	2	5	5	4	1	5	4	14	10	5	7	63	67.0
Drawl	0	0	4	1	2	1	1	3	4	1	3	0	20	21.2
Subscriber-operator B														
Clause	4	1	8	4	4	3	7	3	6	5	3	5	53	63.8
Intonation	3	1	9	5	2	2	3	1	12	8	5	4	55	66.3
Drawl	2	0	0	0	0	0	1	0	2	1	1	0	7	8.4
Operator C-subscriber														
Clause	10	6	2	2	0	3	7	2	19	3	11	5	70	60.3
Intonation	13	4	4	3	2	6	9	7	18	5	13	10	94	81.0
Drawl	1	1	2	1	1	2	2	2	3	3	5	2	25	21.6
Subscriber-operator C														
Clause	6	5	2	2	1	1	8	1	10	3	8	5	52	61.2
Intonation	8	5	4	5	1	3	9	4	9	3	9	6	66	77.6
Drawl	1	2	0	0	0	1	1	1	0	2	3	1	12	14.1

Table B.19: Relationship between number of turn-yielding cues conjointly displayed and the terminations point of overlaps during travel enquiry calls

a) Operator A's session

Number of turn-yielding cues conjointly displayed: Frequency of overlaps at junctures with different number of cues displayed

| Number of turn-yielding cues conjointly displayed | Groups | | | | | | | | | | | | | % of |
	1	2	3	4	5	6	7	8	9	10	11	12	Total	total
Operator-subscriber														
0	0	0	0	0	0	0	1	0	0	0	0	0	1	5.3
1	1	0	0	1	1	0	0	1	0	1	1	0	6	31.6
2	1	1	0	4	0	0	0	2	0	1	2	0	11	57.9
3	0	0	0	0	0	1	0	0	0	0	0	0	1	5.3
Total	2	1	0	5	1	1	1	3	0	2	3	0	19	100.0
Subscriber-operator														
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
1	0	1	1	1	1	0	0	1	1	0	0	1	7	20.6
2	2	0	1	4	2	1	2	7	2	1	3	0	25	73.5
3	1	0	0	0	0	0	0	0	0	0	1	0	2	4.7
Total	3	1	2	5	3	1	2	8	3	1	4	1	34	100.0

Note:

The initiation points implicated turn-yielding cues on the following occasions:
  Session A - call 4 and 8
  Session C - call 1, 6, and 9.

Table B.19: Relationship between number of turn-yielding cues conjointly displayed and the terminations point of overlaps during travel enquiry calls continued

b) Operator B's session

Number of turn-yielding cues conjointly displayed	Frequency of overlaps at junctures with different number of cues displayed													% of
	Groups													
	1	2	3	4	5	6	7	8	9	10	11	12	Total	total
Operator-subscriber														
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
1	2	0	1	0	0	0	1	0	0	0	0	1	5	29.4
2	0	0	2	1	1	0	4	0	1	2	0	1	12	70.6
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Total	2	0	3	1	1	0	5	0	1	2	0	2	17	100.0
Subscriber-operator														
0	0	0	0	0	1	0	0	0	0	0	0	0	1	4.8
1	0	1	0	1	0	1	0	2	0	1	0	0	6	28.6
2	0	0	1	3	0	0	2	1	2	1	1	3	14	66.7
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Total	0	1	1	4	1	1	2	3	2	2	1	3	21	100.0

Table B.19: Relationship between number of turn-yielding cues conjointly displayed and the terminations point of overlaps during travel enquiry calls continued

c) Operator C's session

| Number of turn-yielding cues conjointly displayed | Frequency of overlaps at junctures with different number of cues displayed | | | | | | | | | | | | | % of |
| | Groups | | | | | | | | | | | | | |
	1	2	3	4	5	6	7	8	9	10	11	12	Total	total
Operator-subscriber														
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
1	1	0	0	0	0	2	0	0	1	0	2	0	6	35.3
2	3	0	0	0	0	0	2	0	3	1	0	0	9	52.9
3	0	0	0	0	0	1	0	0	0	0	1	0	2	11.8
Total	4	0	0	0	0	3	2	0	4	1	3	0	17	100.0
Subscriber-operator														
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
1	0	0	0	0	0	1	0	1	0	1	2	0	5	22.7
2	5	0	0	0	0	0	1	3	4	1	0	2	16	72.7
3	0	0	0	0	0	0	0	1	0	0	0	0	1	4.5
Total	5	0	0	0	0	1	1	5	4	2	2	2	22	100.0

Table B.20: Frequency of individual turn-yielding cues displayed at the termination points of overlaps during travel enquiry calls

Turn-yielding cues	Frequency of overlaps marked by each cue													
	Groups													% of
	1	2	3	4	5	6	7	8	9	10	11	12	Total	total
Operator A-subscriber														
Clause	2	1	0	4	1	1	0	3	0	2	3	0	17	89.5
Intonation	1	1	0	3	0	1	0	2	0	1	2	0	10	7.7
Drawl	0	0	0	2	0	1	0	0	0	0	0	0	3	15.8
Subscriber-operator A														
Clause	3	1	2	5	3	1	2	8	3	1	4	1	34	100.0
Intonation	3	0	1	4	2	1	2	4	2	1	4	0	24	70.6
Drawl	1	0	0	0	0	0	0	3	0	0	1	0	5	14.7
Operator B-subscriber														
Clause	2	0	3	1	1	0	5	0	1	2	0	2	17	100.0
Intonation	0	0	2	1	0	0	2	0	1	2	0	1	9	52.9
Drawl	0	0	0	0	1	0	2	0	0	0	0	0	3	17.6
Subscriber-operator B														
Clause	0	1	1	4	0	1	2	3	2	2	1	3	20	95.2
Intonation	0	0	1	2	0	0	2	1	2	1	1	2	12	57.1
Drawl	0	0	0	1	0	0	0	0	0	0	0	1	2	9.5
Operator C-subscriber														
Clause	3	0	0	0	0	3	2	0	4	1	3	0	16	94.1
Intonation	3	0	0	0	0	1	2	0	3	0	1	0	10	58.9
Drawl	1	0	0	0	0	1	0	0	0	1	1	0	4	23.5
Subscriber-operator C														
Clause	5	0	0	0	0	1	1	5	4	2	2	2	22	100.0
Intonation	5	0	0	0	0	0	1	3	3	1	0	2	15	68.2
Drawl	0	0	0	0	0	0	0	2	1	0	0	0	3	13.7

Table B.21: Relationship between number of turn-yielding cues conjointly displayed and turn-medial utterances during travel enquiry calls

a) Operator A's session

Number of turn-yielding cues conjointly displayed	Frequency of turn-medial at junctures with different with different number of cues displayed												% of
	Groups													
	1	2	3	4	5	6	7	8	9	10	11	12	Total	total
Operator-subscriber														
0	1	1	0	3	0	1	0	0	0	0	0	0	6	33.3
1	5	0	0	1	0	1	0	0	0	0	1	0	8	44.4
2	3	0	0	1	0	0	0	0	0	0	0	0	4	22.2
Total	9	1	0	5	0	2	0	0	0	0	1	0	18	100.0
Subscriber-operator														
0	0	0	2	0	2	0	2	0	1	0	0	1	8	34.8
1	2	0	0	0	0	3	0	1	0	1	3	1	11	47.8
2	0	0	0	0	0	0	1	0	0	0	2	1	4	17.4
Total	2	0	2	0	2	3	3	1	1	1	5	3	23	100.0

Table B.21: Relationship between number of turn-yielding cues conjointly displayed and turn-medial utterances during travel enquiry calls continued

b) Operator B's session

Number of turn-yielding cues conjointly displayed	Frequency of turn-medial utterances at junctures with different number of cues displayed													% of total
	Groups												Total	
	1	2	3	4	5	6	7	8	9	10	11	12		
Operator-subscriber														
0	0	0	1	0	0	0	0	0	1	0	0	1	3	9.7
1	0	1	8	0	1	0	0	1	3	2	2	0	18	58.1
2	1	0	2	0	0	1	2	1	1	0	0	1	9	29.0
3	0	0	1	0	0	0	0	0	0	0	0	0	1	3.2
Total	1	1	12	0	1	1	2	2	5	2	2	2	31	100.0
Subscriber-operator														
0	1	0	0	0	0	0	0	0	4	2	0	0	7	29.2
1	2	0	3	1	0	0	0	1	0	1	2	0	10	41.6
2	0	0	2	0	0	0	1	1	2	0	0	0	6	25.0
3	1	0	0	0	0	0	0	0	0	0	0	0	1	4.3
Total	4	0	5	1	0	0	1	2	6	3	2	0	24	100.0

Table B.21: Relationship between number of turn-yielding cues conjointly displayed and turn-medial utterances during travel enquiry calls continued

c) Operator C's session

Number of turn-yielding cues conjointly displayed	Frequency of turn-medial at junctures with different number of cues displayed													
	Groups													% of
	1	2	3	4	5	6	7	8	9	10	11	12	Total	total
Operator-subscriber														
0	0	1	0	0	2	0	0	0	0	0	0	0	3	7.3
1	5	3	1	1	1	1	1	0	5	2	0	3	23	56.1
2	0	2	0	0	0	1	1	1	6	1	3	0	15	36.6
Total	2	6	1	1	3	2	2	1	11	3	3	3	41	100.0
Subscriber-operator														
0	0	0	0	0	1	0	1	0	0	0	1	0	3	17.6
1	2	1	0	0	0	3	0	1	1	1	2	1	12	70.6
2	1	0	0	0	0	0	0	0	0	0	1	0	2	11.8
Total	3	1	0	0	1	3	1	1	1	1	4	1	17	100.0

Table B.22: Frequency of individual turn-yielding cues displayed at turn-medial during travel enquiry calls

| Turn-yielding cues | Frequency of turn-medial marked by each cue Groups | | | | | | | | | | | | | % of |
	1	2	3	4	5	6	7	8	9	10	11	12	Total	total
Operator A-subscriber														
Clause	5	0	0	2	0	1	0	0	0	0	1	0	9	50.0
Intonation	2	0	0	1	0	0	0	0	0	0	0	0	3	16.7
Drawl	4	0	0	0	0	0	0	0	0	0	0	0	4	20.0
Subscriber-operator A														
Clause	1	0	0	0	0	2	1	0	0	0	4	2	10	43.5
Intonation	1	0	0	0	0	0	0	0	0	0	1	1	3	13.0
Drawl	0	0	0	0	0	1	1	1	0	1	2	0	6	26.1
Operator B-subscriber														
Clause	1	1	7	0	1	1	2	2	4	2	2	1	24	77.4
Intonation	1	0	4	0	0	0	2	0	0	0	0	1	8	25.8
Drawl	0	0	4	0	0	1	0	1	1	0	0	0	7	22.6
Subscriber-operator B														
Clause	2	0	4	1	0	0	1	2	2	1	1	0	14	58.3
Intonation	1	0	2	0	0	0	1	1	2	0	1	0	8	33.3
Drawl	2	0	1	0	0	0	0	0	0	0	0	0	3	12.5
Operator C-subscriber														
Clause	1	4	0	0	0	2	1	1	10	2	3	3	27	65.9
Intonation	2	3	1	1	1	1	1	1	3	2	2	0	18	43.9
Drawl	2	0	0	0	0	0	1	0	4	0	1	0	8	19.5
Subscriber-operator C														
Clause	2	0	0	0	0	3	0	0	1	1	3	1	11	68.8
Intonation	2	1	0	0	0	0	0	1	0	0	1	0	5	31.3
Drawl	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0

Appendix V

Fortran 77 programme for sorting data from judgement studies

```
C      ************************************************************
C      **** PROGRAM TO COLLATE EXTRACT, ANSWERS, AND SUBJECT DATA *****
C      ************************************************************
C      **** JUDGEMENTS OF DRAWL AND TURN COMPLETION FOR 12 SPEAKERS ***
C      ************************************************************
C      SPECIFICATION OF CH. VAR. NAMES OF EXTRACT PROPERTIES
       CHARACTER*1 QPART*2, QCON, QSSEX, QISP*2
       DIMENSION  QPART(144), QCON(144), QSSEX(144), QISP (144)
C      SPECIFICATION OF VAR. NAMES OF SUBJECTS
       CHARACTER*1 SSSEX, SCS
       DIMENSION  SSSEX(50), SCS(50), ISSN(50)
C      SPECIFICATION OF ANSWERS
       CHARACTER*1 ANSWER
       DIMENSION  ANSWER(154,50)
C      SPECIFICATION OF CHARACTER VARIABLES TO CARRY I/O FILE NAMES.
       CHARACTER*12 INFE, INFS, INFA
C      SPECIFICATION OF ARRAY TAB1, TAB2, TAB3, TAB4, TAB5, TAB6, TAB7
C      TO CARRY RESULTS
       DIMENSION  TAB1(100,15), TAB2(100,15),TAB3(100,15),TAB4(100,15),
      >           TAB5(100,15),TAB6(100,15),TAB7(100,15)
C      SPECIFICATION OF TEMPORARY STATISTICS 1-D ARRAY TO CARRY DATA TO
C      SUBROUTINE STATS1 AND TEMP. INTEGER ARRAY.
       DIMENSION X(1000),IBUFF(200)
C      SPECIFICATION OF 1-D ARRAY TO HOLD NAMES OF EXTRACT SPEAKERS
       CHARACTER*2 NAMES(25)
C      ************************************************************
C      **** INPUT OF DATA FILES TO BE ANALYSED AND STORAGE IN ARRAY****
C      ************************************************************
       WRITE(1,10)
10     FORMAT(
      >'PLEASE TYPE THE NAME OF THE DATA FILES REQUIRED
      >'(DATA.EXT , DATA.SUB, ANS).
      >'THE NAME OF THE FILE MUST NOT EXCEED 12 CHARACTERS.
      >'PRESS RETURN AFTER EACH FILE NAME.          ')
       READ(1,20) INFE,INFS,INFA
20     FORMAT(A12/A12/A12)
       OPEN(UNIT=5,FILE=INFE,STATUS='OLD')
       OPEN(UNIT=6,FILE=INFS,STATUS='OLD')
       OPEN(UNIT=7,FILE=INFA,STATUS='OLD')
       READ(5,25)NEXTR
25     FORMAT(I4)
       DO 30 I=1,NEXTR
       READ(5,40)QPART(I),QCON(I),QSSEX(I),QISP(I)
40     FORMAT(4X,A2,1X,A1,1X,A1,1X,A2)
30     CONTINUE
       READ(6,50)NSUB
50     FORMAT(I4)
       DO 60 I=1,NSUB
       READ(6,70)SSSEX(I),SCS(I),ISSN(I)
70     FORMAT(3X,A1,1X,A1,1X,I1)
60     CONTINUE
       READ(7,80)NANS
80     FORMAT(I4)
       DO 90 I=1,NANS
       READ(7,100) (ANSWER(I,J),J=1,NSUB)
```

```
100     FORMAT(29(A1,1X),A1)
 90     CONTINUE
        CLOSE(5)
        CLOSE(6)
        CLOSE(7)
C       **********************************************************************
C       TO FIND TOTAL NUMBER OF Y/N ANSWERS GIVEN OVERALL
C       **********************************************************************
C       zero array used for results
        DO 115 IROW=1,53
        DO 117 JCOL=1,3
        TAB1(IROW,JCOL)=0
117     CONTINUE
115     CONTINUE
C       search answers for y/n answers
        DO 120 ISUB=1,NSUB
        DO 130 IANS=1,144
        IF(ANSWER(IANS,ISUB).EQ.'Y') THEN
        TAB1(ISUB,1)=TAB1(ISUB,1)+1.0
        ELSE IF(ANSWER(IANS,ISUB).EQ.'N') THEN
        TAB1(ISUB,2)=TAB1(ISUB,2)+1.0
        ELSE
        WRITE(1,140)IANS,ISUB
140     FORMAT('ERROR...HAVE NOT FOUND Y OR N IN DATA FILE ROW= ',I3,'COL
       >UMN= ',I3)
        STOP
        ENDIF
130     CONTINUE
C       calculate %
        TAB1(ISUB,3)=(TAB1(ISUB,1)/(TAB1(ISUB,1)+TAB1(ISUB,2)))*100.0
120     CONTINUE
C       read data into temporary stats array (1-d)
        DO 200 JCOL=1,3
        DO 210 I=1,NSUB
        X(I)=TAB1(I,JCOL)
210     CONTINUE
        CALL STATS1(NSUB,X,TAB1(NSUB+1,JCOL),TAB1(NSUB+2,JCOL),TAB1(NSUB+3
       >,JCOL))
200     CONTINUE
        CALL OPFILE(6,'TOTAL NO OF Y/N ANSWERS                    ')
C       out put results and format
        WRITE(6,240)
240     FORMAT(//// 12X,'TABLE SHOWING TOTAL NO. OF YES/NO ANSWERS BY'/
       >12X,'EACH SUBJECT AND THEIR RATIOS, MEANS AND STANDARD DEV.'///
       >12X,61('-')/12X,
       >'| SUBJ. REF.  | FREQ. "YES" | FREQ. "NO"  | "YES" % RATIO|'/
       >12X,4('|',14('-')),'|')
        DO 250 ISUB=1,NSUB
        WRITE(6,260)ISUB,(TAB1(ISUB,JCOL),JCOL=1,3)
260     FORMAT(12X,'|',5X,I3,6X,3('|',4X,F5.1,5X),'|')
250     CONTINUE
        WRITE(6,270)(TAB1(NSUB+1,J),J=1,3)
        WRITE(6,271)(TAB1(NSUB+2,J),J=1,3)
        WRITE(6,272)(TAB1(NSUB+3,J),J=1,3)
270     FORMAT(12X,60('-')/
```

```fortran
     >12X,'¦   TOTAL        ',3('¦',2X,F10.3,2X),'¦')
271   FORMAT(12X,'¦   MEAN         ',3('¦',2X,F10.3,2X),'¦')
272   FORMAT(12X,'¦   S.D.         ',3('¦',2X,F10.3,2X),'¦'/
     >12X,61('-'))
      CLOSE(6)
C     ****************************************************************
C     FIND TOTAL NUMBER OF TURN-FINAL/MEDIAL YES ANSWERS
C     ****************************************************************
      DO 300 ISUB = 1,NSUB
        DO 295 JCOL = 1,4
        TAB1(ISUB,JCOL) = 0.0
295   CONTINUE
      NTF= 0
      DO 310 IANS=1,144
         IF(QPART(IANS).EQ.'TF')THEN
         NTF=NTF+1
         IF(ANSWER(IANS,ISUB).EQ.'Y')TAB1(ISUB,1)=TAB1(ISUB,1)+1.0
         ELSE IF (QPART(IANS).EQ.'TM')THEN
         IF(ANSWER(IANS,ISUB).EQ.'Y')TAB1(ISUB,3)=TAB1(ISUB,3)+1.0
         ELSE
         PRINT*,'ERROR IN TF OR TM OF EXTRACT NO',IANS
         ENDIF
310      CONTINUE
      TAB1(ISUB,2)=TAB1(ISUB,1)*100.0/FLOAT(NTF)
      TAB1(ISUB,4)=TAB1(ISUB,3)*100.0/FLOAT(144-NTF)
300     CONTINUE
      DO 330 JCOL =1,4
         DO 320 ISUB =1,NSUB
         X(ISUB)=TAB1(ISUB,JCOL)
320     CONTINUE
      CALL STATS1(NSUB,X,TAB1(NSUB+1,JCOL),TAB1(NSUB+2,JCOL),TAB1(NSUB
     >+3,JCOL))
330     CONTINUE
      CALL OPFILE(6,'NO Y. IN TF AND TM                    ')
      WRITE(6,340)
340   FORMAT(//// 12X,'TABLE SHOWING TOTAL NO. OF YES ANSWERS TO TF/TM'/
     >12X,'EXTRACTS; EACH SUBJECTS TOTAL, RATIO, MEAN AND STANDARD DEV'/
     >12X,76('-')/12X,
     >'¦ SUBJ. REF. ¦ FREQ TF "YES"¦ TF "YES" %   ¦ FREQ TM "YES"¦ TM
     >"YES" %  ¦'/
     >12X,5('¦',14('-')),'¦')
      DO 350 ISUB=1,NSUB
      WRITE(6,360)ISUB,(TAB1(ISUB,JCOL),JCOL=1,4)
360   FORMAT(12X,'¦',5X,I3,6X,4('¦',4X,F5.1,5X),'¦')
350     CONTINUE
      WRITE(6,370)(TAB1(NSUB+1,J),J=1,4)
      WRITE(6,371)(TAB1(NSUB+2,J),J=1,4)
      WRITE(6,372)(TAB1(NSUB+3,J),J=1,4)
370   FORMAT(12X,75('-')/
     >12X,'¦   TOTAL        ',4('¦',2X,F10.3,2X),'¦')
371   FORMAT(12X,'¦   MEAN         ',4('¦',2X,F10.3,2X),'¦')
372   FORMAT(12X,'¦   S.D.         ',4('¦',2X,F10.3,2X),'¦'/
     >12X,75('-'))
      CLOSE(6)
C     ****************************************************************
```

```fortran
C        COLLATE SEPARATELY ANSWERS OF PSY+SP.SCIENCE SUBJECTS
         NP=0
         NS=0
         DO 380 IROW=1,NSUB
             IF(SCS(IROW).EQ.'P') THEN
                 NP=NP+1
                 DO 385 JCOL=1,4
                     TAB1(NP,JCOL)=TAB1(IROW,JCOL)
385              CONTINUE
             ELSE IF(SCS(IROW).EQ.'S') THEN
                 NS=NS+1
                 DO 390 JCOL=1,4
                     TAB2(NS,JCOL)=TAB1(IROW,JCOL)
390              CONTINUE
             ELSE
                 PRINT*,'ERROR IN SUBJECT COURSE OF STUDY...SUB REF=',IROW
             ENDIF
380      CONTINUE
         IF(NP.EQ.0.OR.NS.EQ.0) GO TO 408
         DO 392 JCOL=1,4
             DO 394 ISUB=1,NP
                 X(ISUB)=TAB1(ISUB,JCOL)
394          CONTINUE
         CALL STATS1(NP,X,TAB1(NP+1,JCOL),TAB1(NP+2,JCOL),TAB1(NP+3,JCOL))
392      CONTINUE
         DO 395 JCOL=1,4
             DO 396 ISUB=1,NS
                 X(ISUB)=TAB2(ISUB,JCOL)
396          CONTINUE
         CALL STATS1(NS,X,TAB2(NS+1,JCOL),TAB2(NS+2,JCOL),TAB2(NS+3,JCOL))
395      CONTINUE
         CALL OPFILE(6,'PSY + SSP TOT, MEAN+SD                        ')
         WRITE(6,397)
397      FORMAT(//// 12X,'TABLE SHOWING TOTAL NO. OF YES ANSWERS TO TF/TM'/
        >12X,'EXTRACTS; FOR PSYCHOLOGY AND SPEECH SCIENCE SUBJECTS        '/
        >12X,76('-')/12X,
        >'| SUBJ. REF.  | FREQ TF "YES"| TF "YES" %    | FREQ TM "YES"| TM
        >"YES" %    |'/12X,'|',74X,'|'/12X,
        >'|                            PSYCHOLOGY STUDENTS
        >          |'/
        >12X,5('|',14('-')),'|')
         DO 398 ISUB=1,NP
         WRITE(6,399)ISUB,(TAB1(ISUB,JCOL),JCOL=1,4)
399      FORMAT(12X,'|',5X,I3,6X,4('|',4X,F5.1,5X),'|')
398      CONTINUE
         WRITE(6,400)(TAB1(NP+1,J),J=1,4)
         WRITE(6,401)(TAB1(NP+2,J),J=1,4)
         WRITE(6,402)(TAB1(NP+3,J),J=1,4)
400      FORMAT(12X,76('-')/
        >12X,'|    TOTAL       ',4('|',2X,F10.3,2X),'|')
401      FORMAT(12X,'|    MEAN        ',4('|',2X,F10.3,2X),'|')
402      FORMAT(12X,'|    S.D.        ',4('|',2X,F10.3,2X),'|'/
        >12X,76('-'),2(/12X,'|',74X,'|')/12X,
        >'|                        SPEECH SCIENCE STUDENTS
        >           |'/
```

```
      >12X,5('|',14('-')),'|')
       DO 403 ISUB=1,NS
       WRITE(6,399)ISUB,(TAB2(ISUB,JCOL),JCOL=1,4)
403    CONTINUE
       WRITE(6,400)(TAB2(NS+1,J),J=1,4)
       WRITE(6,401)(TAB2(NS+2,J),J=1,4)
       WRITE(6,407)(TAB2(NS+3,J),J=1,4)
407    FORMAT(12X,'|      S.D.        ',4('|',2X,F10.3,2X),'|'/
      >12X,76('-'))
       CLOSE (6)
C      ****************************************************************
C      TO FIND TOTAL NO. YES ANSWERS TO EACH EXTRACT; TF/TM DISTINGUISHED
C      ****************************************************************
408    DO 409 IROW=1,75
          DO 410 JCOL=1,6
          TAB1(IROW,JCOL)=0.0
410    CONTINUE
409    CONTINUE
       NTF=0
       DO 415 IANS=1,144
       IF(QPART(IANS).EQ.'TF')THEN
       NTF=NTF+1
          DO 420 ISUB=1,NSUB
             IF(ANSWER(IANS,ISUB).EQ.'Y') TAB1(NTF,2)=TAB1(NTF,2)+1.0
420    CONTINUE
          TAB1(NTF,1)=FLOAT(IANS)
          TAB1(NTF,3)=TAB1(NTF,2)*100.0/FLOAT(NSUB)
       ELSE IF(QPART(IANS).EQ.'TM')THEN
          DO 430 ISUB=1,NSUB
             IF(ANSWER(IANS,ISUB).EQ.'Y') TAB1(IANS-NTF,5)=
      >                                   TAB1(IANS-NTF,5)+1.0
430    CONTINUE
          TAB1(IANS-NTF,4)=FLOAT(IANS)
          TAB1(IANS-NTF,6)=TAB1(IANS-NTF,5)*100.0/FLOAT(NSUB)
       ENDIF
415    CONTINUE
       DO 440 JCOL=1,6
       IF(JCOL.EQ.1.OR.JCOL.EQ.4)GOTO 440
          DO 450 IANS=1,72
          X(IANS)=TAB1(IANS,JCOL)
450    CONTINUE
       CALL STATS1(72,X,TAB1(73,JCOL),TAB1(74,JCOL),TAB1(75,JCOL))
440    CONTINUE
       CALL OPFILE(6,'TOTAL YANS GIVEN BY EACH S FOR EACH EXT ')
       WRITE(6,460)
460    FORMAT(////12X,'TABLE SHOWING TOTAL AND RATIO OF Y ANS GIVEN BY '/
      >12X,'EACH SUB. FOR EACH EXTRACT.'/
      >12X,61('-')/12X,
      >'|     TURN FINAL EXTRACTS        |   TURN MEDIAL EXTRACTS          |'/
      >12X,61('-')/12X,
      >'|EXT.REF. |FREQ YES |% SUB YES|EXT.REF. |FREQ YES |% SUB YES|'/
      >12X,6('|',9('-')),'|')
C      convert data to integer
       DO 470 IROW=1,72
       I1=INT(TAB1(IROW,1))
```

```
            I2=INT(TAB1(IROW,2))
            I3=INT(TAB1(IROW,4))
            I4=INT(TAB1(IROW,5))
            WRITE(6,480)I1,I2,TAB1(IROW,3),I3,I4,TAB1(IROW,6)
480         FORMAT(12X,2(2('|',3X,I3,3X),'|',2X,F5.1,2X),'|')
470     CONTINUE
            WRITE(6,490) TAB1(73,2),TAB1(73,5)
            WRITE(6,492) TAB1(74,2),TAB1(74,3),TAB1(74,5),TAB1(74,6)
            WRITE(6,494) TAB1(75,2),TAB1(75,3),TAB1(75,5),TAB1(75,6)
490     FORMAT(12X,61('-')/12X,
        >'| TOTAL | ',F7.0,' |             |             | ',F7.0,' |             |')
492     FORMAT(12X,
        >'| MEAN  | ',F7.2,' | ',F7.2,
        >          ' |           | ',F7.2,' | ',F7.2,' |')
494     FORMAT(12X,
        >'| S.D.  | ',F7.2,' | ',F7.2,
        >          ' |           | ',F7.2,' | ',F7.2,' |/
        >12X,61('-'))
            CLOSE(6)
C       ****************************************************************
C       TO FIND TOTAL NUMBER OF YES ANSWERS FOR AGREEMENT AND DISAGREEMENT
C       EXTRACTS AND ALSO PRODUCE SEPARATE TABLE FOR TF/TM EXTRACTS*******
C       ****************************************************************
        DO 500 ISUB=1,NSUB
            DO 510 JCOL=1,4
            TAB1(ISUB,JCOL)=0.0
            TAB2(ISUB,JCOL)=0.0
510     CONTINUE
        NA=0
            DO 520 IANS=1,144
              IF(QCON(IANS).EQ.'A') THEN
                    NA=NA+1
                    IF(ANSWER(IANS,ISUB).EQ.'Y') THEN
                        TAB1(ISUB,1)=TAB1(ISUB,1)+1.0
                        IF(QPART(IANS).EQ.'TF')THEN
                            TAB2(ISUB,1)=TAB2(ISUB,1)+1.0
                        ELSE IF(QPART(IANS).EQ.'TM') THEN
                            TAB2(ISUB,2)=TAB2(ISUB,2)+1.0
                        ENDIF
                    ENDIF
              ELSE IF(QCON(IANS).EQ.'D') THEN
                    IF(ANSWER(IANS,ISUB).EQ.'Y') THEN
                        TAB1(ISUB,3)=TAB1(ISUB,3)+1.0
                        IF(QPART(IANS).EQ.'TF') THEN
                            TAB2(ISUB,3)=TAB2(ISUB,3)+1.0
                        ELSE IF(QPART(IANS).EQ.'TM') THEN
                            TAB2(ISUB,4)=TAB2(ISUB,4)+1.0
                        ENDIF
                    ENDIF
              ENDIF
520     CONTINUE
        TAB1(ISUB,2)=TAB1(ISUB,1)*100.0/FLOAT(NA)
        TAB1(ISUB,4)=TAB1(ISUB,3)*100.0/FLOAT(144-NA)
        TAB2(ISUB,1)=TAB2(ISUB,1)*100.0/FLOAT(NA)
        TAB2(ISUB,2)=TAB2(ISUB,2)*100.0/FLOAT(NA)
```

```fortran
      TAB2(ISUB,3)=TAB2(ISUB,3)*100.0/FLOAT(144-NA)
      TAB2(ISUB,4)=TAB2(ISUB,4)*100.0/FLOAT(144-NA)
500   CONTINUE
      DO 540 JCOL=1,4
         DO 550 ISUB=1,NSUB
         X(ISUB)=TAB1(ISUB,JCOL)
550   CONTINUE
      CALL STATS1(NSUB,X,TAB1(NSUB+1,JCOL),TAB1(NSUB+2,JCOL),
     >TAB1(NSUB+3,JCOL))
540   CONTINUE
      DO 560 JCOL=1,4
         DO 570 ISUB=1,NSUB
         X(ISUB)=TAB2(ISUB,JCOL)
570   CONTINUE
      CALL STATS1(NSUB,X,TAB2(NSUB+1,JCOL),TAB2(NSUB+2,JCOL),
     >TAB2(NSUB+3,JCOL))
560   CONTINUE
C     format and output of table showing answers for a/d
      CALL OPFILE(6,'TOTAL NO Y ANS GIVEN FOR AG+DIS EXTRACTS ')
      WRITE(6,575)
575   FORMAT(//// 12X,'TABLE SHOWING % NO. OF YES ANSWERS TO'/
     >12X,'AGREEMENT/DISAGREEMENT EXTRACTS; EACH SUBJECTS TOTAL'/
     >12X,'RATIO, MEAN AND STANDARD DEV'/
     >12X,76('-')/12X,
     >'|                 |        AGREEMENT        |       DISAGREEMENT
     >          |'/
     >12X,'|',74('-'),'|',/12X,
     >'| SUBJ. REF. | FREQ "YES" |  % "YES"      | FREQ   "YES" |  %
     >"YES"    |'/
     >12X,5('|',14('-')),'|')
      DO 600 ISUB=1,NSUB
      WRITE(6,610)ISUB,(TAB1(ISUB,JCOL),JCOL=1,4)
610   FORMAT(12X,'|',5X,I3,6X,4('|',4X,F5.1,5X),'|')
600   CONTINUE
      WRITE(6,620)(TAB1(NSUB+1,J),J=1,4)
      WRITE(6,630)(TAB1(NSUB+2,J),J=1,4)
      WRITE(6,640)(TAB1(NSUB+3,J),J=1,4)
620   FORMAT(12X,76('-')/
     >12X,'|    TOTAL      ',4('|',2X,F10.3,2X),'|')
630   FORMAT(12X,'|     MEAN      ',4('|',2X,F10.3,2X),'|')
640   FORMAT(12X,'|     S.D.      ',4('|',2X,F10.3,2X),'|' /
     >12X,76('-'))
      CLOSE (6)
C     format and output of y answers for a/d extracts
      CALL OPFILE(11,' % Y FOR TF, TM IN AGREE/DISAGREEMENT    ')
      WRITE(11,780)
780   FORMAT(12X,'TABLE SHOWING % Y ANS MADE BY EACH SUBJECT FOR  '/
     >12X,'TM/TF EXTRACTS TAKEN FROM AGREEMENT AND DISAGREEMENT    '/
     >12X,'EXTRACTS.'/
     >12X,51('-')/12X,
     >'| SUB REF.|        AGREEMENT    |     DISAGREEMENT    |'/
     >22X,41('-')/12X,
     >'|         | % TF. |  % TM. |  % TF. |  % TM. |'/
     >12X,5('|',9('-')),'|')
      DO 800 ISUB=1,NSUB
```

```fortran
      WRITE(11,810)ISUB,(TAB2(ISUB,JCOL),JCOL=1,4)
810   FORMAT(12X,'|',3X,I3,3X,4('|',2X,F5.1,2X),'|')
800   CONTINUE
      WRITE(11,820)(TAB2(NSUB+1,J),J=1,4)
      WRITE(11,830)(TAB2(NSUB+2,J),J=1,4)
      WRITE(11,840)(TAB2(NSUB+3,J),J=1,4)
820   FORMAT(12X,50('-')/
     >12X,'| TOTAL   ',4('|',1X,F8.3),'|')
830   FORMAT(12X,'| MEAN    ',4('|',1X,F8.3),'|')
840   FORMAT(12X,'| S.D.    ',4('|',1X,F8.3),'|'/
     >12X,51('-'))
      CLOSE (11)
C     ********************************************************************
C     TO FIND TOTAL NUMBER OF YES ANSWERS TO M/F TF/TM EXTRACTS
C     ********************************************************************
      DO 900 ISUB=1,NSUB
         DO 910 JCOL=1,8
         TAB1(ISUB,JCOL)=0.0
910      CONTINUE
         DO 920 IANS=1,144
         IF(ANSWER(IANS,ISUB).EQ.'Y') THEN
             IF(QPART(IANS).EQ.'TF')THEN
                 IF(QSSEX(IANS).EQ.'M') THEN
                     TAB1(ISUB,1)=TAB1(ISUB,1)+1.0
                 ELSE IF(QSSEX(IANS).EQ.'F') THEN
                     TAB1(ISUB,3)=TAB1(ISUB,3)+1.0
                 ENDIF
             ELSE IF(QPART(IANS).EQ.'TM') THEN
                 IF(QSSEX(IANS).EQ.'M') THEN
                     TAB1(ISUB,5)=TAB1(ISUB,5)+1.0
                 ELSE IF(QSSEX(IANS).EQ.'F') THEN
                     TAB1(ISUB,7)=TAB1(ISUB,7)+1.0
                 ENDIF
             ENDIF
         ENDIF
920      CONTINUE
      TAB1(ISUB,2)=TAB1(ISUB,1)*100.0/FLOAT(36)
      TAB1(ISUB,4)=TAB1(ISUB,3)*100.0/FLOAT(36)
      TAB1(ISUB,6)=TAB1(ISUB,5)*100.0/FLOAT(36)
      TAB1(ISUB,8)=TAB1(ISUB,7)*100.0/FLOAT(36)
900   CONTINUE
      DO 930 JCOL=1,8
         DO 940 ISUB=1,NSUB
         X(ISUB)=TAB1(ISUB,JCOL)
940      CONTINUE
      CALL STATS1(NSUB,X,TAB1(NSUB+1,JCOL),TAB1(NSUB+2,JCOL),
     >                                     TAB1(NSUB+3,JCOL))
930   CONTINUE
      CALL OPFILE(6,'TOT/% TF/TM YES ANS TO M/F EXTRACTS    ')
      WRITE(6,950)
950   FORMAT(////12X,'TABLE SHOWING TOTAL AND % OF "YES" ANSWERS TO'/
     >12X,'MALE AND FEMALE EXTRACTS.'/
     >12X,72('-')/12X,
     >'|        |       TURN FINAL EXTRACT.        |      TURN MEDIAL EXTRACT
     >.       |'/20X,64('-')/12X,
```

```
       >'¦EXT SP/¦     MALE        ¦    FEMALE     ¦      MALE      ¦   FEMA
       >LE       ¦'/12X,72('-')/12X,
       >'¦SUB REF¦ NO YES¦ % YES  ¦ NO YES¦ % YES ¦ NO YES¦ % YES ¦ NO YES
       >¦ % YES¦'/
       >12X,9('¦',7('-')),'¦')
       DO 960 ISUB=1,NSUB
       WRITE(6,970) ISUB,(TAB1(ISUB,JCOL),JCOL=1,8)
970    FORMAT(12X,'¦',2X,I3,2X,8('¦',1X,F5.1,1X),'¦')
960    CONTINUE
       WRITE(6,980)(TAB1(NSUB+1,JCOL),JCOL=1,8)
       WRITE(6,990)(TAB1(NSUB+2,JCOL),JCOL=1,8)
       WRITE(6,1000)(TAB1(NSUB+3,JCOL),JCOL=1,8)
980    FORMAT(12X,71('-')/
      >12X,'¦ TOTAL ',8('¦',F7.2),'¦')
990    FORMAT(12X,'¦ MEAN  ',8('¦',F7.2),'¦')
1000   FORMAT(12X,'¦ S.D.  ',8('¦',F7.2),'¦'/
      >12X,72('-'))
       CLOSE (6)
C      ***************************************************************
C      EXAMINE SUBJECTS PERFORMANCE IN 1, 2, 3, 4 QUARTER; TF/TM SEPARATELY
C      ***************************************************************
       DO 2000 ISUB=1,NSUB
           DO 2010 JCOL=1,5
           TAB1(ISUB,JCOL)=0.0
           TAB2(ISUB,JCOL)=0.0
2010       CONTINUE
           DO 2020 IQUART=1,4
              NTF=0
              NTM=0
              DO 2030 IANS=(IQUART-1)*36+1,IQUART*36
                 IF(QPART(IANS).EQ.'TF') THEN
                     NTF=NTF+1
                     IF(ANSWER(IANS,ISUB).EQ.'Y')TAB1(ISUB,IQUART)=
      >                                    TAB1(ISUB,IQUART)+1.0
                 ELSE IF(QPART(IANS).EQ.'TM') THEN
                     NTM=NTM+1
                     IF(ANSWER(IANS,ISUB).EQ.'Y')TAB2(ISUB,IQUART)=
      >                                    TAB2(ISUB,IQUART)+1.0
                 ENDIF
2030          CONTINUE
              TAB1(ISUB,IQUART)=TAB1(ISUB,IQUART)*100.0/FLOAT(NTF)
              TAB2(ISUB,IQUART)=TAB2(ISUB,IQUART)*100.0/FLOAT(NTM)
2020       CONTINUE
2000   CONTINUE
       DO 2040 JCOL=1,4
           DO 2050 ISUB=1,NSUB
              X(ISUB)=TAB1(ISUB,JCOL)
2050       CONTINUE
       CALL STATS1(NSUB,X,TAB1(NSUB+1,JCOL),TAB1(NSUB+2,JCOL),
      >                                    TAB1(NSUB+3,JCOL))
2040   CONTINUE
       DO 2060 JCOL=1,4
           DO 2070 ISUB=1,NSUB
              X(ISUB)=TAB2(ISUB,JCOL)
2070       CONTINUE
```

```
            CALL STATS1(NSUB,X,TAB2(NSUB+1,JCOL),TAB2(NSUB+2,JCOL),
          >                                      TAB2(NSUB+3,JCOL))
2060    CONTINUE
C       format and output turn-final
        CALL OPFILE(6,'TF EXT %YES MADE IN 1,2,3+4 QUARTERS       ')
        WRITE(6,2090)
2090    FORMAT(////12X,'TABLE SHOWING % "YES" ANSWERS TO TURN FINAL'/
       >12X,'EXTRACTS IN THE FIRST,SECOND, THIRD AND FOURTH QUARTER.'/
       >12X,76('-')/12X,
       >'| SUBJ. REF.  | FIRST QUARTER| SEC. QUARTER | THIRD QUARTER| FOU
       >R. QUARTER|'/
       >12X,5('|',14('-')),'|')
        DO 2100 ISUB=1,NSUB
        WRITE(6,2110)ISUB,(TAB1(ISUB,JCOL),JCOL=1,4)
2110    FORMAT(12X,'|',5X,I3,6X,4('|',4X,F5.1,5X),'|')
2100    CONTINUE
        WRITE(6,2120)(TAB1(NSUB+1,J),J=1,4)
        WRITE(6,2130)(TAB1(NSUB+2,J),J=1,4)
        WRITE(6,2140)(TAB1(NSUB+3,J),J=1,4)
2120    FORMAT(12X,76('-')/
       >12X,'|   TOTAL        ',4('|',2X,F10.3,2X),'|')
2130    FORMAT(12X,'|    MEAN        ',4('|',2X,F10.3,2X),'|')
2140    FORMAT(12X,'|    S.D.        ',4('|',2X,F10.3,2X),'|' /
       >12X,76('-'))
        CLOSE (6)
C       format and output turn medial
        CALL OPFILE(6,'TM EXT %YES MADE IN 1,2,3+4 QUARTERS       ')
        WRITE(6,2200)
2200    FORMAT(////12X,'TABLE SHOWING % "YES" ANSWERS TO TURN MEDIAL'/
       >12X,'EXTRACTS IN THE FIRST,SECOND, THIRD AND FOURTH QUARTER.'/
       >12X,76('-')/12X,
       >'| SUBJ. REF.  | FIRST QUARTER| SEC. QUARTER | THIRD QUARTER| FOU
       >R. QUARTER|'/
       >12X,5('|',14('-')),'|')
        DO 2210 ISUB=1,NSUB
        WRITE(6,2220)ISUB,(TAB2(ISUB,JCOL),JCOL=1,4)
2220    FORMAT(12X,'|',5X,I3,6X,4('|',4X,F5.1,5X),'|')
2210    CONTINUE
        WRITE(6,2230)(TAB2(NSUB+1,J),J=1,4)
        WRITE(6,2235)(TAB2(NSUB+2,J),J=1,4)
        WRITE(6,2240)(TAB2(NSUB+3,J),J=1,4)
2230    FORMAT(12X,76('-')/
       >12X,'|   TOTAL        ',4('|',2X,F10.3,2X),'|')
2235    FORMAT(12X,'|    MEAN        ',4('|',2X,F10.3,2X),'|')
2240    FORMAT(12X,'|    S.D.        ',4('|',2X,F10.3,2X),'|' /
       >12X,76('-'))
        CLOSE (6)
C       ***************************************************************
C       TO COMPARE SUBJECTS ANSWERS TO FIRST 1-10 AND REPEAT AT END EXP**
C       ***************************************************************
C       a few subjects did not do this part and following excludes them
C       from calculation
        MISS=0
        IF(ANSWER(145,1).EQ.'0') MISS=6
        DO 2300 ISUB=1+MISS,NSUB
```

```
              X(ISUB-MISS)=0.0
              DO 2320 IANS=1,10
                 IF(ANSWER(IANS,ISUB).EQ.ANSWER(IANS+144,ISUB))
        >               X(ISUB-MISS)=X(ISUB-MISS)+1.0
2320          CONTINUE
2300    CONTINUE
        N=NSUB-MISS
        CALL STATS1(N,X,X(N+1),X(N+2),X(N+3))
        CALL OPFILE(6,'COMPARISON OF SUB ANSWERS 1-10,145-154.  ')
        WRITE(6,2340)
2340    FORMAT(////12X,'TABLE COMPARING THE SUBJECTS ANSWERS TO THE'/
        >12X,'FIRST TEN EXTRACTS AND THE LAST TEN EXTRACTS.          '/
        >12X,31('-')/12X,
        >'¦  SUBJ. REF.  ¦ NO. CONST ANS¦'/
        >12X,2('¦',14('-')),'¦')
        DO 2350 ISUB=1,N
        M=INT(X(ISUB))
        WRITE(6,2360)ISUB+MISS,M
2360    FORMAT(12X,'¦',5X,I3,6X,'¦',6X,I2,6X,'¦')
2350    CONTINUE
        WRITE(6,2370)X(N+1),X(N+2),X(N+3)
2370    FORMAT(12X,31('-')/
        >12X,'¦    TOTAL      ¦',2X,F10.3,2X,'¦¦'/
        >12X,'¦    MEAN       ¦',2X,F10.3,2X,'¦¦'/
        >12X,'¦    S.D.    •  ¦',2X,F10.3,2X,'¦¦'/12X,31('-'))
        CLOSE (6)
C       *******************************************************************
C       TO FIND FOR EACH SPEAKER THE TOTAL NUMBER OF YES ANSWERS GIVEN BY
C       EACH SUBJECT FOR TM/TF. THE ANSWERS FOR TM/TF FOR AGREEMENT AND
C       DISAGREEMENT EXTRACTS ARE ALSO CALCULATED **********************
C       *******************************************************************
C       finding the initials of all the different speakers
C       searches all extracts, storing found names in ibox
        NFOUND=0
        DO 2390 IEXT=1,144
            INEW=1
            DO 2400 IBOX=1,25
                IF(QISP(IEXT).EQ.NAMES(IBOX)) INEW=0
2400        CONTINUE
            IF(INEW.EQ.1) THEN
                NFOUND=NFOUND+1
                NAMES(NFOUND)=QISP(IEXT)
            ENDIF
2390    CONTINUE
        IF(NFOUND.NE.12)THEN
            PRINT*,'ERROR ....... NFOUND = ',NFOUND
            STOP
        ENDIF
        DO 2420 ISUB=1,NSUB
            DO 2415 JCOL=1,15
             TAB1(ISUB,JCOL)=0.0
             TAB2(ISUB,JCOL)=0.0
             TAB3(ISUB,JCOL)=0.0
             TAB4(ISUB,JCOL)=0.0
             TAB5(ISUB,JCOL)=0.0
```

```
                    TAB6(ISUB,JCOL)=0.0
                    TAB7(ISUB,JCOL)=0.0
2415        CONTINUE
C       sorting y answers and matching with appropriate speaker
            DO 2410 IEXT=1,144
                IF(ANSWER(IEXT,ISUB).EQ.'Y') THEN
                    DO 2430 IBOX=1,NFOUND
                        IF(QISP(IEXT).EQ.NAMES(IBOX)) JSP=IBOX
2430                CONTINUE
C       overall number of y ars for each speaker
                    TAB3(ISUB,JSP)=TAB3(ISUB,JSP)+1.0
C       number of y answers for tf overall, a+d extracts
                    IF(QPART(IEXT).EQ.'TF')THEN
                        TAB1(ISUB,JSP)=TAB1(ISUB,JSP)+1.0
                        IF(QCON(IEXT).EQ.'A')THEN
                            TAB4(ISUB,JSP)=TAB4(ISUB,JSP)+1.0
                        ELSE IF(QCON(IEXT).EQ.'D')THEN
                            TAB5(ISUB,JSP)=TAB5(ISUB,JSP)+1.0
                        ENDIF
C       number of y answers for tm overall, a+d extracts
                    ELSE IF(QPART(IEXT).EQ.'TM') THEN
                        TAB2(ISUB,JSP)=TAB2(ISUB,JSP)+1.0
                        IF(QCON(IEXT).EQ.'A')THEN
                            TAB6(ISUB,JSP)=TAB6(ISUB,JSP)+1.0
                        ELSE IF(QCON(IEXT).EQ.'D')THEN
                            TAB7(ISUB,JSP)=TAB7(ISUB,JSP)+1.0
                        ENDIF
                    ENDIF
                ENDIF
2410        CONTINUE
2420    CONTINUE
        DO 2450 JCOL=1,12
            DO 2460 ISUB=1,NSUB
            X(ISUB)=TAB1(ISUB,JCOL)
2460        CONTINUE
        CALL STATS1(NSUB,X,TAB1(NSUB+1,JCOL),TAB1(NSUB+2,JCOL),
     >                                      TAB1(NSUB+3,JCOL))
2450    CONTINUE
        DO 2470 JCOL=1,12
            DO 2480 ISUB=1,NSUB
            X(ISUB)=TAB2(ISUB,JCOL)
2480        CONTINUE
        CALL STATS1(NSUB,X,TAB2(NSUB+1,JCOL),TAB2(NSUB+2,JCOL),
     >                                      TAB2(NSUB+3,JCOL))
2470    CONTINUE
        DO 2482 JCOL=1,12
            DO 2484 ISUB=1,NSUB
            X(ISUB)=TAB3(ISUB,JCOL)
2484        CONTINUE
        CALL STATS1(NSUB,X,TAB3(NSUB+1,JCOL),TAB3(NSUB+2,JCOL),
     >                                      TAB3(NSUB+3,JCOL))
2482    CONTINUE
        DO 2486 JCOL=1,12
            DO 2488 ISUB=1,NSUB
            X(ISUB)=TAB4(ISUB,JCOL)
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2488        CONTINUE
      CALL STATS1(NSUB,X,TAB4(NSUB+1,JCOL),TAB4(NSUB+2,JCOL),
     >                                     TAB4(NSUB+3,JCOL))
2486  CONTINUE
      DO 2489 JCOL=1,12
          DO 2490 ISUB=1,NSUB
          X(ISUB)=TAB5(ISUB,JCOL)
2490        CONTINUE
      CALL STATS1(NSUB,X,TAB5(NSUB+1,JCOL),TAB5(NSUB+2,JCOL),
     >                                     TAB5(NSUB+3,JCOL))
2489  CONTINUE
      DO 2492 JCOL=1,12
          DO 2494 ISUB=1,NSUB
          X(ISUB)=TAB6(ISUB,JCOL)
2494        CONTINUE
      CALL STATS1(NSUB,X,TAB6(NSUB+1,JCOL),TAB6(NSUB+2,JCOL),
     >                                     TAB6(NSUB+3,JCOL))
2492  CONTINUE
          DO 2498 ISUB=1,NSUB
          X(ISUB)=TAB7(ISUB,JCOL)
2498        CONTINUE
      CALL STATS1(NSUB,X,TAB7(NSUB+1,JCOL),TAB7(NSUB+2,JCOL),
     >                                     TAB7(NSUB+3,JCOL))
2496  CONTINUE
      CALL OPFILE(6, 'TOTAL TF YES ANS FOR EACH SP OF EXTRACT  ')
      CALL OPFILE(7, 'TOTAL TFA YES ANS FOR EACH SP OF EXTRACT ')
      CALL OPFILE(8, 'TOTAL TFD YES ANS FOR EACH SP OF EXTRACT ')
      CALL OPFILE(9, 'TOTAL TMA YES ANS FOR EACH SP OF EXTRACT ')
      CALL OPFILE(13, 'TOTAL TMD YES ANS FOR EACH SP OF EXTRACT')
      CALL OPFILE(11,'TOTAL TM YES ANS FOR EACH SP OF EXTRACT  ')
      CALL OPFILE(12,'TOTAL YES ANS FOR EACH SP OF EXTRACT     ')
      WRITE(6,2500)
2500  FORMAT(////12X,'TABLE SHOWING THE TOTAL "YES" RESPONSES MADE'/
     >12X,'EACH SUBJECT TO TURN FINAL EXTRACTS OF INDIVIDUAL SPEAKERS'/
     >12X,66('-'))
      WRITE(11,2505)
2505  FORMAT(////12X,'TABLE SHOWING THE TOTAL "YES" RESPONSES MADE'/
     >12X,'EACH SUBJECT TO TURN MEDIAL EXTRACTS OF INDIVIDUAL SPEAKERS'/
     >12X,66('-'))
      WRITE(12,2507)
2507  FORMAT(////12X,'TABLE SHOWING THE TOTAL "YES" RESPONSES MADE'/
     >12X,'EACH SUBJECT TO ALL THE EXTRACTS OF INDIVIDUAL SPEAKERS'/
     >12X,66('-'))
      WRITE(7,2502)
2502  FORMAT(////12X,'TABLE SHOWING THE TOTAL "YES" RESPONSES MADE'/
     >12X,'EACH SUBJECT TO ALL ATF EXTRACTS OF INDIVIDUAL SPEAKERS'/
     >12X,66('-'))
      WRITE(8,2503)
2503  FORMAT(////12X,'TABLE SHOWING THE TOTAL "YES" RESPONSES MADE'/
     >12X,'EACH SUBJECT TO ALL DTF EXTRACTS OF INDIVIDUAL SPEAKERS'/
     >12X,66('-'))
      WRITE(9,2504)
2504  FORMAT(////12X,'TABLE SHOWING THE TOTAL "YES" RESPONSES MADE'/
     >12X,'EACH SUBJECT TO ALL ATM EXTRACTS OF INDIVIDUAL SPEAKERS'/
     >12X,66('-'))
```

```fortran
      WRITE(13,2506)
2506  FORMAT(////12X,'TABLE SHOWING THE TOTAL "YES" RESPONSES MADE'/
     >12X,'EACH SUBJECT TO ALL DTM EXTRACTS OF INDIVIDUAL SPEAKERS'/
     >12X,66('-'))
C     outputs initial of speakers
      WRITE(6,2510)(NAMES(IBOX),IBOX=1,12)
      WRITE(7,2510)(NAMES(IBOX),IBOX=1,12)
      WRITE(8,2510)(NAMES(IBOX),IBOX=1,12)
      WRITE(9,2510)(NAMES(IBOX),IBOX=1,12)
      WRITE(13,2510)(NAMES(IBOX),IBOX=1,12)
      WRITE(11,2510)(NAMES(IBOX),IBOX=1,12)
      WRITE(12,2510)(NAMES(IBOX),IBOX=1,12)
2510  FORMAT(12X,'|','S.RF',12('|',1X,A2,1X),'|'/12X,66('-'))
C     data converted to integers
      DO 2520 ISUB=1,NSUB
          DO 2530 I=1,12
              IBUFF(I)=INT(TAB1(ISUB,I))
              IBUFF(I+15)=INT(TAB2(ISUB,I))
              IBUFF(I+30)=INT(TAB3(ISUB,I))
              IBUFF(I+45)=INT(TAB4(ISUB,I))
              IBUFF(I+60)=INT(TAB5(ISUB,I))
              IBUFF(I+75)=INT(TAB6(ISUB,I))
              IBUFF(I+90)=INT(TAB7(ISUB,I))
2530      CONTINUE
          WRITE(6,2540)ISUB,(IBUFF(JCOL),JCOL=1,12)
          WRITE(11,2540)ISUB,(IBUFF(JCOL),JCOL=16,27)
          WRITE(12,2540)ISUB,(IBUFF(JCOL),JCOL=31,42)
          WRITE(7,2540)ISUB,(IBUFF(JCOL),JCOL=46,57)
          WRITE(8,2540)ISUB,(IBUFF(JCOL),JCOL=61,72)
          WRITE(9,2540)ISUB,(IBUFF(JCOL),JCOL=76,87)
          WRITE(13,2540)ISUB,(IBUFF(JCOL),JCOL=91,102)
2540      FORMAT(12X,13('|',1X,I2,1X),'|')
2520  CONTINUE
      WRITE(6,2560)(TAB1(NSUB+1,JCOL),JCOL=1,12)
      WRITE(6,2570)(TAB1(NSUB+2,JCOL),JCOL=1,12)
      WRITE(6,2580)(TAB1(NSUB+3,JCOL),JCOL=1,12)
      WRITE(11,2560)(TAB2(NSUB+1,JCOL),JCOL=1,12)
      WRITE(11,2570)(TAB2(NSUB+2,JCOL),JCOL=1,12)
      WRITE(11,2580)(TAB2(NSUB+3,JCOL),JCOL=1,12)
      WRITE(12,2560)(TAB3(NSUB+1,JCOL),JCOL=1,12)
      WRITE(12,2570)(TAB3(NSUB+2,JCOL),JCOL=1,12)
      WRITE(12,2580)(TAB3(NSUB+3,JCOL),JCOL=1,12)
      WRITE(7,2560)(TAB4(NSUB+1,JCOL),JCOL=1,12)
      WRITE(7,2570)(TAB4(NSUB+2,JCOL),JCOL=1,12)
      WRITE(7,2580)(TAB4(NSUB+3,JCOL),JCOL=1,12)
      WRITE(8,2560)(TAB5(NSUB+1,JCOL),JCOL=1,12)
      WRITE(8,2570)(TAB5(NSUB+2,JCOL),JCOL=1,12)
      WRITE(8,2580)(TAB5(NSUB+3,JCOL),JCOL=1,12)
      WRITE(9,2560)(TAB6(NSUB+1,JCOL),JCOL=1,12)
      WRITE(9,2570)(TAB6(NSUB+2,JCOL),JCOL=1,12)
      WRITE(9,2580)(TAB6(NSUB+3,JCOL),JCOL=1,12)
      WRITE(13,2560)(TAB7(NSUB+1,JCOL),JCOL=1,12)
      WRITE(13,2570)(TAB7(NSUB+2,JCOL),JCOL=1,12)
      WRITE(13,2580)(TAB7(NSUB+3,JCOL),JCOL=1,12)
2560  FORMAT(12X,66('-')/12X,'|TOT |',12(F4.0,'|'))
```

```fortran
 2570   FORMAT(12X,'|MEAN|',12(F4.2,'|'))
 2580   FORMAT(12X,'|S.D.|',12(F4.2,'|')/12X,66('-'))
        CLOSE (6)
        CLOSE (7)
        CLOSE (8)
        CLOSE (9)
        CLOSE (13)
        CLOSE (11)
        CLOSE (12)
        STOP
        END
C       ****************************************************************
C       ************** END OF MAIN PROGRAM *****************************
C       ****************************************************************
C       ****************************************************************
C       calculates total, mean, standard dev. of data in 1-d buffer array
        SUBROUTINE STATS1(N,DATA,SIGMA,XBAR,SD)
        DIMENSION DATA(1000)
        SIGMA=0.0
        XBAR=0.0
        SD=0.0
        DO 10 I=1,N
        SIGMA=SIGMA+DATA(I)
 10     CONTINUE
        XBAR=SIGMA/FLOAT(N)
        DO 20 I=1,N
        SD=SD+(DATA(I)-XBAR)**2/FLOAT(N)
 20     CONTINUE
        SD=SQRT(SD)
        RETURN
        END
C       ****************************************************************
C       opens channel for particular set of results
        SUBROUTINE OPFILE(NUNIT,PROMPT)
        CHARACTER*40 PROMPT,FINAME*12
        PRINT*,'PLEASE TYPE THE NAME OF THE RESULTS DATA FILE FOR'
        PRINT*,PROMPT
        READ(1,10)FINAME
 10     FORMAT(A12)
        OPEN(UNIT=NUNIT,FILE=FINAME,STATUS='MODIFY')
        RETURN
        END
```

Appendix VI

A pilot investigation into the role of visual information in discriminating turn-final and turn-medial utterances in agreement and disagreement

In the main study it was found that overall judges could not distinguish the turn-final and turn-medial utterances taken from agreement on the basis of the information available in the isolated audio presentation of the extracts. It was noted that there exists the possibility that visual information may play a more important role in distinguishing these utterances in conversations involving agreement as opposed to disagreement. The aim of this pilot work was to investigate this possibility. However, there was a major methodological problem in setting-up this investigation. Basically the problem stemmed from the fact that in each group there were four participants so how could the stimulus be presented to ensure that the judges would focus exclusively on the speaker? It was decided to attempt to blank off three-quarters of the screen so that only the speaker was visable. This was achieved by altering the circuit in a mini-mixer so that instead of combining the signal from two different synchronised video sources, it combined the signal of one video source with no signal. This meant that it was then possible to use the mixing facility to blank off segments of the video. However, the arrangement of the four chairs in the original study did not fall directly into any of these segments. Consequently it was only possible to use the speakers that had been sitting in what was effectively the far left hand part of the screen. In order to investigate the role of visual information it was obviously necessary to use the same extracts that had been used in the main study but only three of the twelve participants were actually seated in this part of the screen. All of these speakers were male. It was decided that it was worth carrying out this pilot study using this limited data base just in case it revealed any striking results that had clear implications for the role of visual information in turn-taking in conversations involving agreement.

Fifty subjects, who were recruited from British Telecom's Human Factors subject panel, took part in this judgement experiment. It should be noted that since there is evidence that females and males differ in the degree to which they are sensitive to nonverbal information (see, for example Hall, 1980, 1984) an equal number of female and male judges were recruited. The subjects were initially shown a frozen picture of the whole group so that they had some idea of where the other participants were sitting. They were then shown all the twelve extracts of one speaker. After each extract the video was stopped and the judges were asked to decide whether or not the person had finished speaking in a forced-choice procedure. Subjects were then shown the extracts of the other two speakers and were again asked to judge whether or not they were complete.

Table C.1. shows the mean percentage of completion judgements for each of the three speakers. It can be seen that the results were not straightforward. For speaker 1(11)[1] judges could distinguish the turn-final and turn-medial utterances when they were taken from the agreement condition but not when taken from the disagreement condition. For speaker 3(5) judges could also make this distinction but in this case only when the extracts were taken from disagreement. For speaker 2(10) judges could not make this discrimination at all on the basis of the visual information available. It is interesting to note that there was no difference between female and male judges in their completion judgements. There is therefore no evidence that visual 'cues' are used more frequently in agreement and disagreement. The results of this pilot study corroborate earlier work in pointing to the considerable variation between individuals in the use of visual information to regulate turn exchange (see chapter 4 and, for example, Beattie, 1981). Moreover, if the results of this investigation are compared with those of the main study (see Tables C.1 and 5.2) it can be seen that it is not necessarily the case that participants rely on one form of cue (i.e. visual or discrete linguistic information) to distinguish their turn-final and turn-medial utterances; for example speaker 3(5) in disagreement distinguished his turn-medial utterances both verbally and visually whilst speaker 2 (10) did not use either of these cues to distinguish turn-final or turn-medial utterances in agreement.

Table C.1: Mean percentage of utterances judged complete from the vision-only presentation of the extracts

Speakers	Agreement		Disagreement	
	Turn-final	Turn-medial	Turn-final	Turn-medial
1(11)	72.0	44.0	38.7	38.0
2(10)	50.0	52.7	49.3	44.0
3(5)	33.3	44.0	70.0	38.7

1. The number in brackets refers to the speakers reference for the tables given in the main study.

References

Albert, S. and Kessler, S. (1978) Ending social encounters, *Journal of Experimental Social Psycholgy* **14**, 541-553.

Argyle, M., (1967) *The Psychology of Interpersonal Behaviour (4th edition)*, Harmondsworth: Penguin.

Argyle, M., (1974) *Social Interaction*, London: Methuen.

Argyle, M., Alkema, F. and Gilmour, R. (1971) The communication of friendly and hostile attitudes by verbal and nonverbal signals, *European Journal of Social Psychology* **1**, 385-402.

Argyle, M. and Dean, J. (1965) Eye-contact, distance and affiliation, *Sociometry* **28**, 289-304.

Argyle, M., Salter, V., Nicholson, H., Williams, M. and Burgess, P. (1970) The communication of inferior and superior attitudes by verbal and nonverbal signals, *British Journal of Social and Clinical Psychology* **9**, 222-231.

Atkinson, M. (1984a) Public speaking and audience responses: some techniques for inviting applause, in J. Atkinson and J. Heritage (eds.), *Structures of Social Action: Studies in Conversation Analysis*, Cambridge: Cambridge University Press.

Atkinson, M. (1984b) *Our Masters Voice*, London: Methuen.

Atkinson, J. and Heritage, J. (1984) *The Structure of Social Action: Studies in Conversational Analysis.*, Cambridge: Cambridge University Press.

Ball, P. (1975) Listener responses to filled pauses in relation to floor apportionment, *British Journal of Social and Clinical Psychology* **14**, 423-424.

Barnard, P. (1974) Unpublished corpus of 800 directory enquiry conversations.

Beattie, G. (1977) The dynamics of interruption and the filled pause, *British Journal of Social and Clinical Psychology* **16**, 283-284.

Beattie, G. (1978a) Floor apportionment and gaze in conversational dyads, *British Journal of Social and Clinical Psychology* **18**, 391-392.

Beattie, G. (1978b) Sequential temporal patterns of speech and gaze in dialogue, *Semiotica* **23**, 29-52.

Beattie, G. (1980) The role of language production processes in the organisation of behaviour in face-to-face interaction, in B. Butterworth (ed.), *Language production, Vol 1*. London: Academic Press.

Beattie, G. (1981a) The regulation of speaker-turns in face-to-face conversation: some implications for conversation in sound-only communication channels, *Semiotica* **34**, 55-70.

Beattie, G. (1981b) Interruption in conversational interaction, and its relation to the sex and status of the interactants, *Linguistics* **19**, 15-35.

Beattie, G. (1982) Look, just don't interrupt, *New Scientist* **95**, 859-60.

286

Beattie, G. (1983) *Talk: an analysis of speech and nonverbal behaviour in conversation*, Milton Keynes: Open University Press.

Beattie, G. (1985) The threads of discourse and the web of interpersonal involvement, *Bulletin of the British Psychological Society* **38**, 169-175.

Beattie, G. (1986) Projecting ahead in conversation to take the turn or to avoid saying anything: How turn-taking proceeds or doesn't. Paper presented at the conference of Talk and Social Structure, University of Santa Barbara, California, March 1986.

Beattie, G. and Barnard, P. J. (1979) The temporal structure of natural telephone conversations (directory enquiry calls), *Linguistics* **17**, 213-30.

Beattie, G. and Bogle, G. (1982) The reliability and validity of different video-recording techniques used for analysing gaze in dyadic interaction, *British Journal of Social Psychology* **21**, 31-4.

Beattie, G., Cutler, A. and Pearson, M. (1982) Why is Mrs. Thatcher interrupted so often? *Nature* **300**, 744-747.

Bennett, A. (1978) Interruptions and the interpretation of conversation, *Proceedings of the Fourth Annual Meeting of the Berkley Linguistics Society*, 557-575.

Birdwhistell, R. (1970) *Kinesics and Context: Essays on Body-Motion Communication*, Harmondsworth: Penguin.

Brown, R. (1986) *Social Psychology*, London: Free Press.

Butterworth, B. (1975) Hesitation and semantic planning in speech, *Journal of Psycholinguistic Reasearch* **4**, 75-87.

Butterworth, B. (1978) Maxims for studying conversations, *Semiotica* **24**, 317-339.

Butterworth, B. (1980) Evidence from pauses in speech, in B. Butterworth (ed.), *Language production, Vol 1*. London: Academic Press.

Butterworth, B. and Beattie, G. (1978) Gesture and silence as indicators of planning in speech, in R.N. Campbell and P.T. Smith (eds.), *Recent Advances in the Psychology of Language: Formal and Experimental Approaches*, New York: Plenum.

Butterworth, B., Hine, R. and Brady, K. (1977) Speech and interaction in sound-only communication channels, *Semiotica* **20**, 81-99.

Cappella, J. (1979) Talk and silence sequences in informal social conversations I, *Human Communication Research* **6**, 3-17.

Cappella, J. (1981) Mutual influences in expressive behaviour: Adult and infant-adult dyadic interaction, *Psychological Bulletin* **89**, 101-132.

Cappella, J. (1984) The relevance of the microstructure of interaction to relationship change, *Journal of Social and Personal Relationships* **1**, 239-64.

Cappella, J. and Planalp, S. (1981) Talk and silence sequences in informal conversations III: interspeaker influence, *Human Comminication Research* **7**, 117-132.

Chomsky, N. (1965) *Aspects of the Theory of Syntax*, Cambridge, Mass: MIT Press.

Chomsky, N. (1976) *Relections on Language*, Glasgow: Fontana.

Chomsky, N. (1980) *Rules and Representations*, Oxford: Basil Blackwell.

Clark, H. (1983) Language use and language users, in G. Lindzey and E. Aranson (eds.), *The Handbook of Social Psychology (3rd. edition)*, Reading MA: Addison Wesley.

Clark, H. and French, J. W. (1981) Telephone good-byes, *Language and Society* **10**, 1-19.

Cohen, A. (1980) The use of hand illustrators in direction giving, in W.Von-Raffler-Engel (ed.), *Aspects of Non-Verbal Communication*, Lisse: Surets and Zeitlinger.

Cohen, J. (1960) A coefficient of agreement for nominal scales, *Educational Psychology Measurement* **20**, 37-46.

Condon, W. and Ogston, W. (1966) Sound film analysis of normal and pathological behaviour patterns, *Journal of Nervous and Mental Disease* **143**, 338-347.

Condon, W. and Ogston, W. (1967) A segmentation of behaviour, *Journal of Psychiatric Research* **5**, 221-235.

Cook, M. and Lalljee, M. (1972) Verbal substitutes for visual signals in interaction, *Semiotica* **6**, 221-21.

Cutler, A. and Pearson, M. (1985) On the analysis of prosodic turn-taking cues, in C. John-Lewis (ed.), *Interaction in Discussion*, London: Croom Helm.

Daniel, W. (1978) *Applied Nonparametric Statistics*, Boston: Houghton Miffin Company.

De Long, A. (1974) Kinesic signals at utterance boundaries in pre-school children, *Semiotica* **11**, 43-73.

De Long, A. (1975) Yielding the floor: the kinesic signals, *Communication in Infancy and Early Childhood* **1**, 98-103.

Dittmann, A. (1972) The body movement-speech rhythm relationship as a cue to speech encoding, in A. Siegman and B. Hope (eds.), *Studies in Dyadic Communication*, New York: Pergamon.

Dittmann, A. and Llewellyn, L. (1967) The phonemic clause as a unit of speech decoding, *Journal of Personality and Social Psychology* **6**, 341-349.

Dittmann, A. and Llewellyn, L. (1968) Relationship between vocalization and head nods as listener responses, *Journal of Personality and Social Psychology* **11**, 98-106.

Dittmann, A. and Llewellyn, L. (1969) Body movement and speech rhythm in social conversation, *Journal of Personality and Social Psychology* **11**, 98-106.

Duncan, S. (1972) Some signals and rules for taking speaking turns in conversations, *Journal of Personality and Social Psychology* **23**, 283-92.

Duncan, S. (1973) Toward a grammar for dyadic conversation, *Semiotica* **9**, 29-47.

Duncan, S. (1974) On the structure of speaker-auditor interaction during speaking turns, *Language in Society* **2**, 161-180.

Duncan, S. (1975) Interaction units during speaking turns in dyadic face-to-face conversations, in A. Kendon, R.M. Harris and M.R. Key (eds.), *The Organisation of Behaviour in Face-to-Face Interaction*, The Hague: Mouton.

Duncan, S. (1980) Describing face-to-face interaction, in W. Von Raffler Engel (ed.) *Aspects of Nonverbal Communication*, Lisse: Surets and Zeitlinger.

Duncan, S. (1983) Speaking turns: Studies of structure and individual differences, in J. Wiemann and R. Harrison (eds.), *Nonverbal Interaction*, Beverley Hills: Sage Publications.

Duncan, S., Brunner, L. and Fiske, D. (1979) Strategy signals in face to face interaction, *Journal of Personal and Social Psychology*, **37**, 301-313.

Duncan, S. and Fiske, D. (1977) *Face-to-face Interaction: Research, Methods and Theory*, New Jersey: Lawrence Erlbaum.

Duncan, S. and Fiske, D. (1979) Dynamic patterning in conversation, *American Scientist* **67**, 90-98.

Duncan, S. and Fiske, D. (1985) *Interaction Structure and Strategy*, Cambridge: Cambridge University Press.

Duncan, S. and Niederehe, G. (1974) On signalling that it's your turn to speak, *Journal of Experimental Social Psychology*, **10**, 234-247.

Eakins, B. and Eakins, G. (1979) Verbal turn-taking and exchanges in faculty dialogue, in B. Dubois and Crouch, I. (eds.), *The Sociology of the Language of American Women*, London: Trinity Press.

Edelsky, C. (1981) Who's got the floor? *Language in Society* **10**, 383-421.

Edmondson, W. (1981) *Spoken Discourse: A Model for Analysis*, London: Longman.

Ekman, P. and Friesen, W. (1969) The repertoire of nonverbal behaviour: categories, origins, usage and coding, *Semiotica* **1**, 49-98.

Ellis, A. and Beattie, G. (1986) *The Psychology of Language and Communication*, London: Weidenfield and Nicolson.

Exline, R. (1963) Explorations in the process of person perception: Visual interaction in relation to competition, sex and need for affiliation, *Journal of Personality* **31**, 1-20

Exline, R.V., Gray, D and Schuette, D (1965) Visual behaviour in a dyad as affected by interview content and sex of respondent, *Journal of Personality and Social Psychology* **1**, 201-209

Farina, A. (1960) Patterns of role dominance and conflict in parents of schizophrenic patients, *Journal of Abnormal and Social Psychology* **61**, 31-38.

289

Ferguson, N. (1977) Simultaneous speech, interruptions and dominance, *British Journal of Social and Clinical Psychology* **16**, 295-302.

Fries, C. (1952) *The Structure of English*, New York: Harcourt, Brace and World.

Gallois, C. and Markel, N. (1975) Turn taking: social personality and conversational style, *Journal of Personality and Social Psychology* **31**, 1134-1140.

Garfinkel, H. (1967) *Studies in Ethnomethodology*, New Jersey: Prentice-Hall.

Giles, H. and Powesland, P. (1975) *Speech Style and Social Evaluation*, London: Academic Press.

Giles, H. and St.Clair, R. (1979) *Language and Social Psychology*, Oxford: Basil Blackwell.

Goffman, E. (1955) On face work: An analysis of ritual elements in social interaction, *Psychiatry: Journal for the Study of Interpersonal Processes* **18**, 213-313.

Goodwin, C. (1981) *Conversational Organization: Interaction between Speakers and Hearers*, London: Academic Press.

Godard, D. (1977) Same setting, different norms: phone call beginings in France and United States, *Language and Society* **6**, 209-219.

Goldman-Eisler, F. (1967) Sequential temporal patterns and cognitive processes in speech, *Language and Speech* **10**, 122-132.

Grice, H. (1975) Logic and conversation, in P. Cole and J. Morgan (eds.), *Syntax and Semantics, Vol. 3: Speech Acts*. New York: Academic Press.

Haas, A. (1979) Acquisition of Genderlect, *Annals of N.Y. Academy of Sciences* **327**, 107-127.

Hall, E. (1959) *The Silent Language*, New York: Doubleday.

Hall, J. (1980) Gender differences in nonverbal communication skills, in R. Rosenthal (ed.), *Quantitative Assessment of Research Domains*, San Francisco: Jossey-Bass.

Hall, J. (1984) *Nonverbal Sex Differences: Communication Accuracy and Expressive Style*, Baltimore: John Hopkins Press.

Halliday, M. and Hasan, R. (1976) *Cohesion in English*, Hong Kong: Longman.

Harrigan, J. (1985) Listeners' body movements and speaking turns, *Human Communication Research* **12**, 233-250.

Harrigan, J. and Steffen, J. (1983) Gaze as turn-exchange signal in group conversation, *British Journal of Social Psychology* **22**, 167-168.

Harris, Z. (1951) *Structural Linguistics*, Chicago: University of Chicago Phoenix Books.

Heath, C. (1982) The display of recipiency: An instance of a sequential relationship in speech and body movement, *Semiotica* **42**, 147-167.

Heath, C. (1984) Interactional participation: The coordination of gesture, speech and gaze, *Proceedings of the Interactional Symposium on Discourse Processes and Natural Rhetoric*, University of Padua, Italy.

Henderson, A., Goldman-Eisler, F. and Skarbek, A. (1966) Sequential temporal patterns in spontaneous speech, *Language and speech* **9**, 207-216.

Henley, N. (1975) Power, sex and non-verbal communication, in B. Thorne and N. Henley (eds.), *Language and Sex Differences*, Newbury: House Press.

Heritage, J. and Atkinson, J. (1984) Introduction, in J. Atkinson and J. Heritage (eds.), *Structures of Social Action: Studies in Conversational Analysis*, Cambridge: Cambridge University Press.

Hetherington, E., Stouwie, R. and Ridberg, E. (1971) Patterns of family interaction and child-rearing attitudes related to three dimensions of juvenile delinquency, *Journal of Abnormal Psychology* **75**, 160-76.

Hewes, G. (1973) Primate communication and the gestural origin of language, *Current Anthropology* **14**, 5-12.

Humenick, S. (1983) Limiting the intrusiveness of the telephone, *Birth: issues in perinatal care and education* **10**, 257-258.

Jacob, T. (1974) Patterns of family conflict and dominance as a function of child age and social class, *Developmental Psychology* **10**, 1-12.

Jacob, T. (1975) Family interaction in disturbed and normal families: a methodological and substantive review, *Psychological Bulletin* **82**, 33-65.

Jaffe, J., Breskin, S. and Gerstman, L. (1972) Random generation of apparent speech rhythms, *Language and Speech* **15**, 68-71.

Jaffe, J. and Feldstein, S. (1970) *Rhythms of Dialogue*, New York: Academic Press.

Jefferson, G. (1973) A case of precision timing in ordinary conversation: overlapped tag-positioned address terms in closing sequences, *Semiotica* **9**, 47-96.

Jefferson, G. (1978) Sequential aspects of story telling in conversation, in J. Schenkein (ed.), *Studies in the Organization of conversational Interaction*, New York: Academic Press.

Jefferson, G. (1986) Colligation as a device for minimizing repair on disagreement. Paper presented at the conference of Talk and Social Structure, University of Santa Barbara, California, March 1986.

Jefferson, G. (in press) List construction as a task and interactional resource, in G. Psathas and R. Frankel (eds.), *Interactional Competences*, Norwood N.J.: Ablex.

Keller, E. (1981) Gambits: Conversational strategy signals, in F. Coulmas (ed.), *Conversational Routine*, The Hague: Mouton.

Kendon, A. (1967) Some functions of gaze direction in social interaction, *Acta Psychologica* **26**, 22-63.

Kendon, A. (1970) Movement coordination in social interaction: Some examples described, *Acta Psychologica*, **32**, 100-125.

Kendon (1972) Some relationships between body motion and speech. An analysis of an example, in A.W. Siegman and B. Pope (eds.). *Studies in Dyadic Communication*, New York: Pergamon.

Kendon, A. (1973) Some functions of gaze direction in social interaction, in M. Argyle (ed.), *Social Encounters*, Harmondsworth: Penguin Books.

Kendon, A. (1978) Looking in conversation and the regulation of turns at talk: a comment on the papers of G. Beattie and D.R. Rutter et al., *British Journal of Social and Clinical Psychology* **17**, 23-24.

Kendon, A. (1982) The organisation of behaviour in face-to-face interaction: observations on the devlopment of a methodology, in K. Scherer and P. Ekman (eds.), *Handbook of Methods in Nonverbal Behaviour Research*, Cambridge: Cambridge University Press.

Kennedy, C. and Camden, C. (1983) A new look at interruptions, *Western Journal of Speech Communication* **47**, 45-58.

Kent, G., Davis, J. and Shapiro, D. (1978) Resources required in the construction and reconstruction of conversation, *Journal of Personality and Social Psychology* **36**, 13-22.

Kimble, C., Yoshikawa, J. and Zehr, D. (1981) Vocal and verbal assertiveness in same-sex and mixed-sex groups, *Journal of Personality and Social Psychology* **40**, 1047-54.

Koomen, W. and Sagel, P. (1977) The prediction of participation in two-person groups, *Sociometry* **40**, 369-373.

La France, M. (1974) Nonverbal cues to conversational turn-taking between black speakers, *Personality and Social Psychology Bulletin* **1**, 240-242.

Lalljee, M. and Cook, M. (1969) An experimental investigation of the function of filled pauses in speech, *Language and Speech* **12**, 24-28.

Leach, C. (1979) *Introduction to Statistics: A Nonparametric Approach for the Social Sciences*, Chichester; Wiley.

Levinson, S. and Liberman, M. (1981) Speech recognition by computer, *Scientific American; Language, Writing and Computers*, California: W.H. Freeman and Company.

Maclay, H. and Osgood, C. (1959) Hesitation phenomena in spontaneous English speech, *Word* **15**, 19-44.

Martin, W. and Jones, R. (1982) The accuracy of eye-gaze judgement: A signal detection approach, *British Journal of Social Psychology* **21**, 293.

McLaughlin, M. (1984) *Conversation: How Talk Is Organized*, California: Sage Publications.

McLaughlin, M., Cody, M. and Rosenstein, N. (1983) Account sequences in conversation between strangers, *Communication Monographs* **50**, 102-125.

McMillian, R., Clifton, K., McGrath, D. and Gale, W. (1977) Women's language: uncertainty or interpersonal sensitivity and emotionality? *Sex Roles* **3**, 545-559.

McQuowan, N. (1959) Natural history method - a frontier method, in A. Maher and L. Pearson (eds.), *Creative Developments in Psychotherapy*, New York: Appleton-Century-Crofts.

Mehrabian, A. and Ferris, S. (1967) Inference of attitudes from nonverbal communication in two channels, *Journal of Consulting Psychology* **31**, 284-252.

Mehrabian, A. and Wiener, M. (1967) Decoding inconsistent communications, *Journal of Personality and Social Psychology* **6**, 109-114.

Meltzer, L., Morris, W. and Hayes, D. (1971) Interruption outcomes and vocal amplitude: Explorations in social psychophysics, *Journal of Personality and Social Psychology* **18**, 392-402.

Miller, G. (1963) Review of Greenberg, J. (ed.) Universals of Language, *Contemporary Psychology* **8**, 417-418.

Mishler, E.G. and Waxler, N.E. (1968) *Interaction in Families: An Experimental Study of Family Processes and Schizophrenia*, New York: Wiley.

Molotch, H. and Boden, D. (1985) Talking social structure: Discourse, domination and the Watergate hearings, *American Sociological Review* **50**, 273-288.

Morris, W. (1971) Manipulated amplitude and interruption outcomes, *Journal of Personality and Social Psychology* **20**, 319-331.

Natale, M., Entin, E. and Jaffe, J. (1979) Vocal interruptions in dyadic communication as a function of speech and social anxiety, *Journal of Personality and Social Psychology* **37**, 865-78.

Nielson, G. (1962) *Studies in Self Confrontation*, Copenhagen: Monksgaard.

Nofsinger, R. (1975) The demand ticket: A conversational device for getting the floor, *Speech Monographs* **42**, 1-9.

Noll, (1967) Capstrum pitch determination, *Journal of the Acoustical Society of America* **41**, 293-309.

Ochs, E. (1979) Transcription as theory, in E. Ochs and B. Scheffelin (eds.), *Development Pragmatics*, New York: Academic Press.

Oller, D. (1973) The effect of position in utterance on speech segment duration in English, *Journal of the Acoustical Society of America* **54**, 1235-1247.

O'Murray, S. (1985) Toward a model of members' method for recognizing interruptions, *Language in Society* **14**, 31-40.

Pomerantz, A. (1978) Agreement and disagreement with assessments: some features of preferred/dispreferred turn shapes, in J. Atkinson and J. Heritage, (eds.,) *The Structure of Social Action; Studies in Conversational Analysis*. Cambridge: Cambridge University Press.

Rim, Y. (1977) Personality variables and interruptions in small group discussions, *European Journal of Social Psychology* **7**, 247-251.

Robbins, O., Devoe, S. and Wiener, M (1978) Social patterns of turn-taking: Nonverbal regulators, *Journal of Communication* **28**, 38-46.

Rochester, S. (1973) The significance of pauses in spontaneous speech, *Journal of Psycholinguistic Research* **2**, 51-81.

Roger, D. (1984) The Role of Simultaneous Speech in Dyadic Conversations. Paper presented at the Interdisciplinary Approaches to Interpersonal Communication, University of York, April 1984.

Roger, D. and Schumacher, A. (1983) Effects of individual differences in dyadic conversational strategies, *Journal of Personality and Social Psychology* **45**, 700-705.

Rogers, W. and Jones, S. (1975) Effects of dominance tendencies on floor holding and interruptive behaviour in dyadic interaction, *Human Communication Research* **1**, 113-122.

Rosenfeld, H. (1972) The experimental analysis of interpersonal influence processes, *Journal of Communication* **22**, 424-442.

Rosenfeld, H. (1978) Conversational control functions of nonverbal behaviour, in A.W. Siegman and S. Fieldstein (eds.), *Nonverbal Behaviour and Communication*, Hillsdale, New Jersey: Lawrence Erlbaum.

Roth, A. (1981) *The Construction of Turns at Talk in Social Interaction*, Ph.D. thesis, The University of Sheffield.

Rutter, D. and Stephenson, G. (1977) The role of visual communication in synchronising conversation, *European Journal of Social Psychology* **7**, 29-37.

Rutter, D., Stephenson, G., Ayling, K. and White, P. (1978) The timing of looks in dyadic conversation, *British Journal of Social and Clinical Psychology*, **17**, 17-21.

Rutter, D., Stephenson, G. and Dewey, M. (1981) Visual communicaiton and the content and style of conversation, *British Journal of Social Psychology* **20**, 41-52.

Sacks, H. (1968) Lecture notes, May 8th.

Sacks, H. (1972) Lecture notes, April 4th.

Sacks, H., Schegloff, E. and Jefferson, G. (1974) A simplest systematics for the organization of turn-taking in conversation, *Language* **50**, 697-735.

Sacks, H., Schegloff, E. and Jefferson, G. (1978) A simplest systematics for the organisation of turn-taking for conversation, in Schenkein, J. (ed.), *Studies in the Organisation of Conversational Interaction*, New York: Academic Press.

Scheflen, A. (1963) Communication and regulation in psychotherapy, *Psychiatry* **26**, 126-136.

Scheflen, A. (1964) The significance of posture in communication systems, *Psychiatry* **27**, 316-331.

Scheflen, A. (1965) Quasi-courtship behaviour in psychotherapy, *Psychiatry* **28**, 245-257.

Schegloff, E. (1972) Sequencing in conversational openings, in J. Gumperz and D. Hymes (eds.), *Directions in Sociolinguistics*, New York: Holt, Rinehart and Winston.

Schegloff, E. (1977) Identification and Recognition in Interactional Openings, in I. Pool (ed) *The Social Impact of the Telephone*, Cambridge: MIT Press.

Schegloff, E. (1980) Preliminaries to preliminaries: Can I ask you a question? *Sociological Inquiry* **50**, 104-152.

Schegloff, E. and Sacks, H. (1973) Opening up closings, *Semiotica* **8**, 289-326.

Schenkein, J. (1978) *Studies in the organisation of Conversational Interaction*, New York: Academic Press.

Scherer, K. (1979) Voice and speech correlates of perceived social influence in simulated juries, in H. Giles and R. St. Clair (eds.), *Language and Social Psychology*, Oxford: Basil Blackwell.

Scherer, K. and Ekman, P. (1982) Methodological issues in studying nonverbal behaviour, in K. Scherer and P. Ekman (eds.), *Handbook of Methods in Nonverbal Behaviour Research*, Cambridge: Cambridge University Press.

Slugoski, B. (1984) A pragmatics approach to conversational turn-taking. Paper presented to the conference on Interdisciplinary Approaches to Interpersonal Communication. University of York, April 1984.

Spender, D. (1982) *Man Made Language*, London: Routledge and Kegan Paul.

Stephens, J. (1986) Psychological approaches to the analysis of conversation. Paper presented at the conference of Talk and Social Structure, University of Santa Barbara, California, March 1986.

Stephens, J. and Beattie, G. (1986) On judging the ends of speaker turns in conversation, *Journal of Language and Social Psychology* **5**, 119-134.

Stephens, J. and Beattie, G. (1987) Turn-taking on the telephone: Textual features which distinguish turn-final and turn-medial utterances, *Journal of Language and Social Psychology* **5**, 211-223.

Stephens, J. and Beattie, G. (in press b) The structure of conversation in agreement and disagreement, in D. Zimmerman (ed), *Talk and Social Structure*, Cambridge: Polity Press.

Stephenson, Ayling and Rutter (1976) The role of visual communication in social exchange, *British Journal of Social and Clinical Psychology* **15**, 113-120.

Talbot, M. (1986) Unpublished corpus of over 300 travel enquiry calls.

Tannen, D. (1984) *Conversational Style: Analysing Talk Among Friends*, Norwood, New Jersey: Ablex Publishing Corporation.

Thomas, A. and Bull, P. (1981) The role of pre-speech posture change in dyadic interaction, *British Journal of Social Psychology* **20**, 105-111.

Tracy, K. (1982) On getting the point: Distinguishing 'issues' from 'events', an aspect of conversational coherence, in M. Burgoon (ed.), *Communication Yearbook 5*, New Brunswick, New Jersey: Transaction.

Tracy, K. (1984) Staying on topic: An explication of conversational relevance, *Discource Processes* **7**, 447-464.

Trager, G. and Smith, H. (1951) An outline of English structure, *Studies in Linguistics*, occasional paper no. 3, Oklahoma: Norman.

Trimboli, C. and Walker, M. (1984) Switching pauses in cooperative and competitive conversations, *Journal of Experimental and Social Psychology* **20**, 297-312.

Trower, P., Bryant, B. and Argyle, M. (1978) *Social Skills and Mental Health*, London: Methuen.

Walker, M. (1982) Smooth transitions in conversational turn-talking: implications for theory, *Journal of Psychology* **110**, 31-37.

Walker, M. and Trimboli, C. (1982) Smooth transitions in conversational interactions, *Journal of Social Psychology* **117**, 305-306.

Walker, M. and Trimboli, C. (1984) The role of nonverbal signals in co-ordinating speaking turns, *Journal of Language and Social Psychology* **3**, 257-272.

Wardbaugh, R. (1985) *The Social Basis of Talk*, London: Basil Blackwell.

Waterworth, J. and Talbot, M. (1985) Information enquiry experiment report, *Vodis Project Report (D4021)*, British Telecom Research Laboratories, Martlesham Heath.

Weisbrod, R. (1965) Looking behaviour in a discussion group, cited by Kendon (1967).

West, C. (1979) Against our will: male interruptions of females in cross-sex conversations, *Annals of New York Academy of Sciences* **327**, 81-97.

West, C. and Zimmerman, D. (1977) Women's place in everyday talk: Reflections on parent-child interaction, *Social Problems* **24**, 521-529.

Wiemann, J. (1973) *An Exploratory Study of Turn-Taking in Conversation: Verbal and Nonverbal Behaviour*, Unpublished M.S. thesis, Purdue University.

Wiemann, J. (1977) Explication and test of a model of communicative competence, *Human Communication Research* **3**, 195-213.

Wiemann, J. (1985) Interpersonal control and regulation in conversation, in R. Street and J. Cappella, *Sequential Pattern in Communicative Behaviour*, London: Edward Arnold.

Wiemann, J. and Knapp, M. (1975) Turn-taking in conversation, *Journal of Communication* **25**, 75-92.

Wiener, M., Devoe, S., Rubinow, S. and Geller, J. (1972) Nonverbal behaviour and communication, *Psychological Review* **79**, 185-214.

Williams, E. (1978) Visual interaction and speech patterns: an extension of previous results, *British Journal of Clinical and Social Psychology* **17**, 101-102.

Wilson, T., Wiemann, J. and Zimmerman, D. (1984) Models of turn-taking in conversational interaction, *Journal of Language and Social Psychology* **3**, 159-183.

Willis, F. and Williams, S. (1976) Simultaneous talking in conversation and sex of speaker, *Perceptual and Motor Skill* **43**, 1067-1070.

Winskowski, C. (1977) Technical problems and instrumentation: topicalisation work in telephone conversations, *International Journal of Psycholinguistics* **4**, 77-93.

Vuchinich, S. (1977) Elements of cohesion between turns in ordinary conversation, *Semiotica* **30**, 229-257.

Vuchinich, S. (1984) Sequencing and social structure in family conflict, *Social Psychology Quarterly* **47**, 217-234.

Yngve, V. (1970) On getting a word in edgewise, *Papers from the sixth regional meeting of the Chicago Linguistic Society*, Chicago: Chicago Linguistic Society.

Zimmerman, D. and West, C. (1975) Sex roles, interruptions and silences in conversation, in B. Thorne and N. Henley (eds.), *Language and Sex. Difference and Dominance*, Rowley, Mass.: Newbury House.