NONCONTENT ASPECTS OF FACE-TO-FACE INTERACTION BETWEEN FRIEND AND STRANGER DYADS

by

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An experiment was performed to test the communication model of convergence using two noncontent measures: reaction time latency and duration of utterance. Participants were paired into dyads on the basis of length of acquaintance. Friend dyad participants had the friendship basis of acquaintance of their partner for a minimum of six months. Stranger dyad participants were required to have had no prior acquaintance. Dyads spoke in unstructured dialogue for 45 minutes on each of two occasions. All conversations were tape recorded and all data was extracted mechanically from the conversational tapes. The communication model was not supported by the obtained data. Stranger dyads did not exhibit the predicted greater convergence pattern expected on both measures over sections of the same conversation or over occasions. Similarly, friend dyads did not exhibit the highly converged pattern expected, invariant both over sections of the same conversation and over occasions on either noncontent measure. Friend dyads were found to exhibit a more balanced pattern on utterance length than stranger dyads, which was characterized as a more equal sharing of the available speaking time in conversation. The appropriateness of describing high correlations on noncontent measures found in unstructured dialogue between peers as

exemplifying convergence is discussed. Partial replications of Kendon (1963) and Gallois and Markel (1975) were performed. Also, the overall pattern displayed by stranger dyads is discussed with reference to the role differentiation strategy proposed by Davis (1976, 1977). Suggestions for future research are offered.

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I INTRODUCTION

Man has the seemingly unique ability to verbally communicate with his fellow man most all aspects of his experience. In conversation we communicate our sublimest thoughts and feelings and also our most mundane. Conversation is one of the most ubiquitous aspects of our daily social life. It is something which most of us have done since our earliest recollections of childhood and are very proficient at by our adulthood. But it is often the case that our commonest experiences, which we take for granted, are the most difficult to explain and describe. This is undeniably true of verbal communication in conversation, which has been of importance to mankind since the prehistory of our species and which is still little understood.

The study of conversational interaction has had one of two main focal points. Either it is studied with regard to the verbal-linguistic components of speech or with regard to the vocal components of speech. The former approach looks at the content of what people discuss while conversing. The latter approach deals not with <u>what</u> is said but <u>how</u> it is said. This approach can be divided into two sub-areas: one dealing with the acoustics of speech and the other dealing with the temporal organization of the communicative sounds

(on-off patterns) made by people while conversing. This latter sub-area is commonly referred to as the noncontent approach. The dialogue is considered the most global unit of analysis in the noncontent approach. And at this relatively early stage of research on conversation, dialogues are usually limited to two-person interactions, since a minimum of two people is necessary for a conversation to occur. The noncontent approach encompasses the breadth of the present research herein undertaken.

A. The Taxonomy of Noncontent Aspects of Speech

Noncontent aspects of conversational interaction have received increasing attention among behavioral scientists over the last twenty-five years. In this time a descriptive classification of the sequencing and durations of sounds and silences in conversation has been developed. This taxonomy is based on one of the most striking characteristics of ordinary face-to-face conversation: its oscillating rhythm. In ordinary conversation, interacting partners alternate between talking and listening and do not conversely always speak simultaneously. This feature of two-person dialogue has been nominated as a "language universal" by Miller (1963). Turn-taking while conversing is thus the cornerstone of any descriptive classification.

Within the framework of turn-taking, it is clear that the most usual circumstance is for one interactant to be speaking and therefore holding the floor at a time. On this basis, the entire length of time that one interactant holds the speaking floor, including his pauses, on a given speaking turn is referred to as a duration of utterance (DOU) or alternately as a "talkspurt" (Norwine and Murphy, 1938). A duration of utterance can be further broken down into its constituent parts, namely vocalizations and pauses. A vocalization is a continuous burst of sound without perceptible break. While a pause is a perceptible silence bound on either side by vocalizations of the same speaker (Feldstein, 1972). The interface by which a speaker becomes an auditor or an auditor becomes a speaker, depending on whether the speaking floor is given up or gained, respectively, is known as a speaker switch. A speaker switch is therefore that period of time bound on one side by a DOU of one interactant and on the other side by a DOU of another interactant.

Concerning the speaker switch, a disagreement has arisen in the literature as to appropriate nomenclature based on differing assignment to interactants. Jaffe and Feldstein (1970) and their associates choose to call the speaker switch a switching pause (SwP). They assign the switching pause time to the speaker loosing the floor, under the assumption that the prior speaker retains the floor until it is taken

away by the other interactant commencing solo talking. Matarazzo and Wiens (1972) and their associates call the speaker switch a reaction time latency (RTL). They assign the reaction time latency to the interactant gaining the speaking floor, under the assumption that the speaker currently holding the floor gives some verbal or nonverbal message to the auditor that he should assume the floor. Insight into this dilemma comes from data presented by Jaffe and Feldstein (1970, p. 128). They report mean pause and switching pause durations of .66 seconds and .77 seconds, respectively, obtained from face-to-face dialogues between strangers. From this data we can well ask why, if the speaker holding the floor intends to continue holding the floor, does he pause longer on the average during a switching pause (when he in fact looses the floor) than during a pause (when he in fact resumes the floor)? Mightn't this be a clear sign that in fact he has given up the floor? On the other hand, since there occur switching pauses of shorter duration than the average pause duration it is obvious that more temporal duration is not invariantly a cue that the current speaker intends to give up the floor. This disagreement, far from being of semantic concern only, has ramifications that reflect upon the foundations of the entire taxonomy.

Consider the last well recognized first-order noncontent speech parameter, namely simultaneous speech (SS). Simultaneous speech occurs when both interactants produce vocalizations concurrently. Simultaneous speech generally takes one of two forms. Either the speaker who was interrupted continues to hold the floor by out talking the interrupting partner, or he looses the floor by ending his vocalization. In the case where the speaker out talks the interrupter, no turn occurring, he has clearly shown his desire to retain the speaking floor. In the latter case, does the speaker give up the floor or is it taken from him? Clearly the floor has changed hands but without a perceptible silence. (Since a negative speaker turn is an untenable proposition, a turn of zero duration can be seen to have occurred). By looking at such a turn as being a switching pause, it is obvious that the floor must have been seized by the auditor. Conversely looking at it as a reaction time latency one must take the assumption that the listener "reacted" prior to the conclusion of the partner's speech.

If we now look again at our previous definition of a duration of utterance, we will see that the end point of a duration of utterance is not explicitly stated. In Jaffe and Feldstein's system it should now be clear that a duration of utterance should include its following switching pause time. Hence these researchers choose not to record a

duration of utterance, but instead look exclusively at the vocalizations and pauses within a given speaking turn. In Matarazzo and Wiens' system a duration of utterance ends with a speaker's last detectable sound prior to loosing the floor. In their system a duration of utterance measure is clearly separate from the silences which characterize the interface between the two interactants' alternating speaking turns. Bearing directly on this taxonomy dilemma is the work of Duncan (1972), who investigated speaking turns in face-to-face interviews using video-tape equipment. He found that speakers typically employed any number of six discrete behavioral cues as turn-yielding signals when they were likely to relinquish the floor and attempt-suppressing signals, usually by gesture, when they desired to retain the floor. An auditor's tendency to take the floor was found to be virtually eliminated in the presence of an attempt-suppressing signal. Also, no matter how many turn-yielding signals were displayed by the speaker, there was no better than a .50 probability of an auditor attempting to take the floor. Duncan (1972, p. 290) notes that "the auditor retains considerable discretion over his responses". We can see from this work clear support for Matarazzo and Wiens' contention that a speaker usually relinquishes the floor willingly and that it is not seized willy-nilly by the auditor. Also of some considerable bearing is the issue

of whether or not vocalizations are a psychologically meaningful noncontent speech parameter. Jaffe and Feldstein (1970, p. 22) present data that the mean duration of vocalization which they have observed in natural dialogue is virtually the same as what linguists have found the phonemic clause length to be. Since the phonemic clause has been "proposed as the encoding unit of speech at the grammatical level" (Boomer, 1965, p. 148) and has also been proposed as the decoding unit of speech by the auditor (Dittmann and Llewellyn, 1967 and 1968), it should be clear that this unit should be relatively invariant among speakers using the same language. From this it follows that this noncontent parameter should be invariant in the presence of psychologically meaningful changes in the speaking situation. Support for this contention is in fact presented by Welkowitz, Feldstein, Finklestein, and Aylesworth (1972, p. 715), who state that "the durations of the vocalizations - or 'bursts of speech' - in a verbal exchange are relatively unmodifiable". With these considerations in mind, the present research has employed the taxonomy of noncontent speech parameters defined by Matarazzo and Wiens.

B. Background

The earliest noncontent approach to conversation was by two communication engineers, Norwine and Murphy, working for the Bell System. Their stated goal was the application of probability theory to the time sequence of telephone communication (Norwine and Murphy, 1938). This pioneering effort merely presented probability distributions of the parameters and didn't attempt to relate them to other characteristics of the speakers. Their method of measuring the noncontent speech parameters was to have the vocal signal transcribed by a recording oscillograph, with the measurements made manually from the paper record. Directly descendant from their efforts is the work of Brady (1965, 1968), who likewise has been concerned with the probability distribution of the parameters in time and, also, with technical considerations in the automatic processing of the speech parameters.

Working in the field of social anthropology, Chapple (1940) was the first researcher to consider the noncontent aspects of speech as being important variables in the study of personality. Since that time, Chapple (1954, 1955, 1962) has attempted to demonstrate his notions concerning the interaction of an individual's temporal speaking style and that individual's personality. Basing this work on derived,

or second-order, noncontent parameters with loaded evaluative implications (for example: initiative, dominance, adjustment), his work is largely suspect (Braehler and Zenz, 1975). However, he did develop the first instrument to measure the on-off patterns of speech in face-to-face interaction, the Interaction Chronograph (Chapple, 1940).

Use of the Interaction Chronograph required an observer to manipulate keys which activated the pens of a continuous event recorder. Thus each time a person "acted" with a communicative-interactive behavior, his observer depressed his key for the duration of the action. It should be noted that Chapple included in his unit of communicative action all verbal as well as nonverbal communications (for example: talking, smiling, head nodding). High reliabilities have been demonstrated with this technique for parameter values obtained in the context of a standardized interview (Saslow and Matarazzo, 1959). Since then, Wiens, Molde, Holman, and Matarazzo (1966) have demonstrated that a record of duration of utterance which eliminates all nonverbal gestures from analysis (a record obtained from a tape recording of the conversation) looses virtually no fidelity in comparison to the same conversation processed by an observer. Thus a record of conversation which has eliminated behaviors such as head nods has been shown to be an accurate representation of conversational interaction. More recently,

fully automated data processing and analysis by computer from tape recorded unstructured conversations between peers has been shown to yield highly reliable and psychologically meaningful results (Jaffe and Feldstein, 1970).

Utilizing measures of noncontent aspects of speech, discriminations between individuals have been possible. For example, Matarazzo and Wiens (1967) note that over changing experimental conditions, while the absolute response latency durations of subjects change, the relative rank of subjects with regard to this measure does not change. Similarly, discriminations on the basis of speech rates (that is, the number of syllables per minute) (Goldman-Eisler, 1954), utterance durations (Matarrzzo and Wiens, 1972), and pause durations (Goldman-Eisler, 1968; Jaffe and Feldstein, 1970; Feldstein, 1972) have been demonstrated. But temporal speaking styles, although consistent, have also been found capable of being modified. Goldman-Eisler (1954), Soskin and John (1963), and Jaffe and Feldstein (1970) have shown modifiability due to changes in conversational partner and changing situations, including effects of stress, loss of visual cues, and interacting in a group. Thus while individuals appear to have characteristic temporal interacting styles, their styles are adaptable to a variety of changing circumstances.

C. The Synchrony Model

Matarazzo and his colleagues have been engaged over the last fifteen years in a research program designed to investigate the effects that a systematic modification in particular noncontent speech behaviors of a programmed conversationist has on a partner's temporal speaking style. They have consistently utilized an interview situation, with normal interviewees (civil servant applicants), in which content has been held constant over experimental conditions. Matarazzo, Weitman, Saslow, and Wiens (1963), using a reversal design in which the interviewer varied his duration of utterance from 5 to 10 to 5 (or, 10 to 5 to 10) seconds over consecutive 15 minute periods, showed that interviewees matched the programmed interviewer changes with 100 per cent increases or 50 per cent decreases (as appropriate for correspondence) in their own mean duration of utterance and this significant effect was individually significant for 28 out of 40 subjects. Using similar reversal designs, Matarazzo, Wiens, and Saslow (1965) have demonstrated limits to this matching phenomena by showing that a 200 per cent increase in interviewer mean duration of utterance (5 to 15 to 5 seconds) produces only a 100 per cent increase in interviewee mean duration of utterance, and, with regard to duration of reaction time latency, Matarazzo and Wiens (1967) have

found a similar concordance of interviewer influence on interviewees. Similar matching in interviews has been demonstrated by Jackson and Pepinsky (1972) on reaction time latencies and by Webb (1972) on speech rates (that is, the number of syllables divided by utterance duration). In the somewhat less structured setting of a presidential press conference matching between question and answer length has been found by Ray and Webb (1966). This consistent finding of pattern matching on noncontent speech parameters has led Matarazzo to propose a synchrony model which posits that any greater interviewer activity, such as longer duration of utterance and shorter reaction time latency, is "interpreted by the interviewee as indicating that the interviewer is more interested in, or more empathic toward, the interviewee, or that he otherwise values the interviewee more" (Matarazzo and Wiens, 1967, p. 65) and results in increased interviewee behavior.

This finding of pattern matching (or variously referred to as synchrony, concordance, convergence, or congruence) has been extended to situations involving unstructured dyadic conversations between peers by Jaffe and Feldstein (1970). These researchers have found high, positive and significant, intraclass correlations (called coefficients of congruence) between the pause durations of conversational partners and between the switching pause durations of conversationists.

(It should be noted that in using this type of analysis their results concerning switching pauses are equivalent to those that would have been obtained had they measured reaction time latency, since only the assignment to interactants is reversed.) Welkowitz and Kuc (1973) provide further evidence for the congruence of switching pause durations of speaking partners. These results suggest that pattern matching is a two-channel phenomena and raises certain questions concerning the appropriateness of the synchrony model in applicability to unstructured conversation. If greater activity of either speaker reinforces the partner and in turn promotes greater activity by the partner, we might well question the limits of this effect and ask under what circumstances it is most likely to appear; such as, will it most often happen in conversations between people who like each other? Webb (1972) has pointed out certain other difficulties in the synchrony model, including its inability to account for speech rate matching in light of evidence suggesting that faster speech rates are perceived by listeners as unpleasant, increasing listener anxiety, and therefore unlikely to be regarded as showing greater interest or more empathy and warmth. Likewise the synchrony model has difficulty explaining the convergence of speech rates to the tempo of background music that has been demonstrated by Heckel, Wiggen, and Salzberg (1963).

D. The Communication Model

Recently, Natale (1975) has proposed an alternate explanation for the pattern matching phenomena. He sees the pattern matching phenomena occurring through a process of autoregulation which is "other directed" or for social purposes. He proposes that a public feedback system is used by speakers to ensure the intelligibility and communicativeness of their speech. He sees this system as operating in such a way that the format or structure of the imput is used as the criterion by which a source structures the format of his output. He bases this model primarily on work derived from acoustical research, in particular on the work of Lane and Tranel (1971). It should be noted that these researchers, in looking at the regulation of vocal intensity, refer to "intelligibility" as the minimum distinguishable speech signal. In other words, "intelligibility" is making sure that your listener can detect what you say over ambient noise levels. Natale (1975) also proposes that closer pattern matching, or convergence, will occur as a function of time; that is, that the absolute difference between the mean parameter values of the two conversationists will decrease over mutual speaking occasions.

Natale (1975) performed two experiments to support his "communication model", utilizing the acoustical measure of

vocal intensity (loudness). In his first experiment he used a modified standardized interview and found a significant effect showing convergence of vocal intensity. This convergence with the interviewer was also found to be individually significant for sixteen out of twenty-one subjects. Thus his first experiment showed that increases in vocal intensity by the interviewer were matched by corresponding increases in vocal intensity by the subjects. Using same-sexed dyads composed of strangers, his second experiment was designed to test the notion that greater convergence occurs as a function of time. He interprets his results as showing greater convergence of vocal intensity over the three speaking occasions he sampled. However, this experiment contains a methodological problem which confounds his results. The problem concerns the manner in which he divides the three dialogues of his dyad participants into three equal periods to draw his data: Period 1 was the first 10 minutes of the first dialogue; Period 2 was the middle 10 minutes of the second dialogue; Period 3 was the last 10 minutes of the final dialogue. Gallois and Markel (1975) have shown that significant differences on temporal speech patterns occur on the basis of the section or phase of a conversation from which the data are drawn; that is, whether it is drawn from the opening, middle, or end of the same conversation. Specifically, Gallois and Markel (1975)

found differences on the amount of speech per turn (similar to duration of utterance), the amount of switching pause time, and the frequency of turns over periods of the same dialogue. This confounding clearly throws doubt on any conclusions concerning the greater convergence as a function of time hypothesis presented on the basis of Natale's second experiment.

There is no straightforward evidence in the literature on noncontent speech parameters to support Natale's greater convergence over time hypothesis. Welkowitz, Feldstein, Finklestein, and Aylesworth (1972), like Natale (1975), found pattern matching on mean vocal intensity and a significantly higher coefficient of congruence on the third speaking occasion than on the first, thus suggesting greater convergence by the third occasion. This effect was only found with stranger dyads who were told they were paired because they were "very similar" to each other (ostensibly based upon a battery of personality tests administered prior to participation) and was not found with stranger dyads who were told they were randomly paired. Still this research is not straightforward evidence for the greater convergence over time hypothesis since a methodological error prevents this conclusion. The eight "similar" dyads on the first occasion and the eight "similar" dyads on the third occasion, whose coefficients of congruence were compared,

were not composed of exactly the same eight dyads on both occasions. In fact, from their procedure section it is not clear that there is any overlap between the dyads of occasion one and those of occasion three. Similarly, Jaffe and Feldstein (1970) mention two unpublished studies in which they used a trend analysis to look at a convergence over time hypothesis. These two studies produced conflicting results. One study, looking at differences over eight speaking occasions, produced a significant linear component of divergence for switching pauses and for vocalizations, and no significant trend for pauses. The other study, looking at differences over three speaking occasions, yielded a significant linear component of convergence for switching pauses and for vocalizations, but again no significant trend for pauses. From these two unpublished studies, which both employed unstructured conversations between peers, no satisfactory conclusions seem possible, except that pause durations seem uneffected by length of interpersonal contact. Likewise inconclusive is a study by Ray and Webb (1966), which found a slight but non-significant tendency for correlations between question and answer length in press conferences (taken from transcript line counts, a duration of utterance approximation) to increase over time. Similarly the data of Matarazzo and his associates, gathered from reversal designs, cannot confirm the greater convergence

over time hypothesis. But since the changes he notes occur even within a first interview session (Matarazzo, Hess, and Saslow, 1962), this suggests that length of interpersonal contact has little or no effect on the pattern matching phenomena. Although there is no clear support for the notion of greater convergence over time, it should be noted that any research which proposes to look at this possibility must consider a methodology which conforms with the findings of Gallois and Markel (1975). Thus research must consider both convergence over sections of a conversation and over occasions. Even if convergence over occasions is not a strong phenomena, convergence within a conversation would tend to support the communication model, since presumably conversationists would be attempting to create an optimal format for their speech on that particular speaking occasion. There has been no research which has looked at the convergence pattern of noncontent speech parameters within the course of single unstructured conversations between peers.

E. Social Implications of the Communication Model

Another aspect of the communication model which deserves attention involves the implications of the interaction between the notion of how the system operates and the greater convergence over time notion. To reiterate, Natale (1975) proposes that the system operates in such a

way that the format or structure of the imput is used as the criterion by which a source structures the format of his output. Thus at any point in time during a conversation a speaker is seen as attempting to create an optimal format for his speech by attempting to match the speech pattern of his interlocuter. That he is not entirely successful at doing this is suggested by the greater convergence over time notion, since if he were successful, the conversationists could be expected within a very short time, probably within minutes of having begun a conversation, to reach some compatible state of close convergence. It would be as if only some short time were necessary for the conversationists to zero in on a speaking style halfway (or some other compromise) between where they both started the conversation. Therefore what the greater convergence over time notion implies is that the conversationists should learn how to structure their speech to this optimal format only after repeated conversational occasions together. Thus it is easy to assume that longterm interactants should be expected to best show this ability to match one another and therefore to be highly converged from situation to situation.

Likely candidates for having a long standing history of mutual interaction are friends. We know that friends are self-chosen, preferred interactors, who freely of outside pressure or outside constraint choose to spend as much time

as possible in mutual interaction (Naegel, 1959; Wright, 1969). It is therefore germane to ask if there is any research on noncontent speech parameters that might show or suggest that the speech patterns of longterm interactants, like friends, might be converged. On the basis of work in social psychology, which shows that friends are likely to be similar in attitudes, interests, and beliefs and likely to share mutually empathic behaviors, such as showing warmth and trust (for example, Argyle, 1972; Rosenfeld and Jackson, 1965), it is worthwhile to note two studies. The first by Welkowitz and Kuc (1973) found that congruence on switching pauses was significantly related to independent ratings of the warmth communicated by conversational dyads composed of strangers. The other study by Welkowitz et al (1972) found that the perception of similarity between dyad participants (experimentally induced in stranger dyads) disposed subjects to converge in vocal intensity. Together, these studies are suggestive that friend pairs, who can be assumed to be similar and to share empathic behaviors on the basis of their relationship, should show a great deal of convergence on the noncontent speech parameters.

There are also two studies which found an <u>overall</u> difference, possibly suggestive of closer convergence in friend dyads, in the speech patterns of longterm versus first-time interactants in which the convergence phenomena

was not studied. Shaw and Sadler (1965) found that the level of intimacy between heterosexual dyads (inferred on the basis of a dyad's relationship: married, dating, or stranger) produced significant differences in the frequencies of silences (defined as the number of times that neither participant talked, thus not differentiating between pauses and reaction time latencies) and interruptions (equivalent to simultaneous speech, but not differentiating between those interruptions that resulted in speaker turns and those that did not) on one of two experimental discussion topics. Their method involved dyads attempting to reach consensus on an issue during ten-minute discussions. Specifically, they found that silences increased with increasing intimacy and that interruptions were much less frequent for married couples than either of the two other groups. They conclude by stating, "it seems that married couples have reached an equilibrium that renders their interactions less susceptible to influence by extraneous variables than are the interactions of other pairs" (Shaw and Sadler, 1965, p. 350). This anecdotal statement does suggest that through repeated interaction with speech patterns of married couples has reached some state of stability. It is conjecturable that such stable interaction patterns reflect the ability to closely match, therefore implying greater convergence.

The other study was performed by Kendon (1963). Utilizing the Chapplian descriptive classification which included nonverbal communicative behaviors (well summarized in Matarazzo, Saslow, and Matarazzo, 1956), Kendon compared the differences in the interaction patterns of his subjects in unstructured conversation with friends or spouses and strangers. In comparison with stranger dyads, he found that friends had shorter actions (a vocalization approximation) and silences (pauses) and fewer interruptions (simultaneous speech), but, when they do interrupt, the interrupted partner is more likely to yield the floor. He found no differences between friends and strangers in the frequency of latent acts (the frequency of speaker switches). He also notes that between strangers but not between friends, the length of action may differ markedly, with one speaking in long sequences of action (duration of utterance approximation) while the other maintains a fairly rapid accompaniment of short sequences of action, thus producing a typically inverse relationship. He concludes, "finally, the subject's performance in conversation with his friend or spouse is much more specifically suited to the details of the partner's performance, whereas when he converses with someone he meets for the first time, his performance has a more general character" (Kendon, 1963, p. 282). By noting that friends' interaction patterns are more specifically suited

to one another, this suggests that friends are able to match each other better than strangers, who he noted sometimes had markedly skewed patterns (suggestive of a lack of convergence). It is also interesting to note that both of these studies found fewer interruptions among friend pairs, again suggestive of better coordination in conversation.

On the basis of these studies, a comparison of the speech patterns of friend and stranger dyads with respect to the convergence phenomena would seem to provide grounds for verifying some of the contentions and implications of the communication model. Also, since it is highly likely that friends will exhibit highly converged speech patterns, it becomes necessary to ask what noncontent measures are most useful to look at in this regard and what this highly converged pattern might look like.

Taken together the noncontent measures of duration of utterance and reaction time latency represent the entirety of time in conversation during any dialogue. Thus someone is always holding the floor for some length of time or gaining the floor with some latency. We have seen that both of these measures are sensitive to variations in the speaking situation and that convergence has been noted to occur with regard to these measures (Matarazzo and Wiens, 1972). Thus by looking at these two measures we might profitably expect to test the communication model and gain further

insight into differences concerning the speech patterns of friends and strangers. In making these comparisons between friends and strangers it will be possible to see if strangers in a relatively short time begin to approach the convergence pattern expected in friend pairs. That this should occur is predicted by the communication model.

With regard to reaction time latency specific predictions of the pattern of close convergence expected among friend dyads are possible. Attention is again called to the zero reaction time latency that occurs when an interactant gains the floor via simultaneous speech. Gallois and Markel (1975), using friend dyads exclusively, have noted that gaining the floor via simultaneous speech may well be a positive element of conversation denoting heightened involvement. Similarly, Matarazzo and Wiens (1972) have also noted this positive element of interrupting and its effect of increasing the tempo (defined as the rapidity of the transitions from auditor to speaker) of interaction. They have stated that in those interview segments in which the most interrupting occurs, they have repeatedly observed "the highest degree of spirited animation and rapport between our interviewer and his applicant" (Matarazzo and Wiens, 1972, p. 116). Directly pertinent in this regard, Kendon (1963) found that such interruptions as do occur between friends are more likely to result in turns, than those

interruptions among stranger dyads. Since it is easy to assume that friends will have more involvement and rapport in conversation than strangers, it is expected that friends will have more zero reaction time latencies than strangers, with this effect being shown in shorter overall reaction time latencies for friends. Moreover if the communication model is correct in its implication that through repeated conversational exchanges interactants learn how to directly match one another, then it is likely that those interactants would know better the turn-taking signals of each other (Duncan, 1972). This should also lead to smoother and quicker exchanges of the speaking floor. Thus it is expected that friend pairs will have shorter reaction time latencies than stranger pairs and that latencies among friend pairs will more nearly be equal for dyad participants. Finally, stranger dyads are expected over time to approach the short latency, converged pattern expected for friend dyads.

On the basis of Kendon (1963), who implies that friends more equally share the available speaking time than strangers, it can be directly inferred that friends should show close convergence on duration of utterance. It is therefore assumed that if one friend speaks in long (or short) durations of utterance that his partner will likewise speak in long (or short) durations of utterance to match. Also expected is that stranger dyads, over time, will come to

more equally share the available speaking time in dialogue. No other implications concerning close convergence on this measure can be garnered from the noncontent literature.

The present study by comparing the speech patterns of friend and stranger dyads will be in a position to test some assumptions and implications of the communication model that have, as of yet, not been satisfactorily asked and answered. The same dyads will speak on each of two occasions. In line with Gallois and Markel (1975), each conversation will be examined by dividing it into three equal parts: beginning, middle, and end. It is expected that stranger dyads will show a tendency to converge over time both within and between occasions. It is expected that friend dyads will show an unvarying pattern of close convergence throughout. Degree of convergence will be tested in the same fashion as Natale (1975), using absolute difference scores and assuming that the smaller the difference the greater the convergence. For comparison purposes, degree of convergence will also be looked at using intraclass correlations. The coefficients of congruence so produced (Jaffe and Feldstein, 1970) will be assumed to show greater convergence with larger correlations. Utilizing this design, the present study will attempt a partial replication of Kendon (1963) using a substantially different methodology. That is, the present study will gather its data solely from

recorded tapes of the interactions and will compare dyads of friends and strangers with no overlap between groups. Comparisons of results will be made between the present study and Kendon (1963) wherever possible. Finally, some comparisons will be possible between the present study and Gallois and Markel (1975).

F. Hypotheses

Two sets of hypotheses will be investigated. The first set will examine questions pertinent to the communication model of convergence posited by Natale (1975). These questions concerning the communication model will be considered in three parts: questions concerning convergence on reaction time latency using absolute difference scores; questions concerning convergence on duration of utterance using absolute difference scores; and questions concerning convergence on both reaction time latency and duration of utterance using coefficients of congruence as developed by Jaffe and Feldstein (1970). The second set of hypotheses will be concerned with both the expected differences between friend and stranger dyads and the expected differences on speech parameters due to the phase or section of a conversation from which the data is extracted. The second set of hypotheses will be based upon the results of other researchers and will use various easily derived measures from

the present study's focus on reaction time latency and duration of utterance.

First set of hypotheses:

I.1. Stranger dyads will show convergence on reaction time latency over occasions.

I.2. Stranger dyads will show convergence on reaction time latency over sections of the same conversation.

I.3. Friend dyads will exhibit a highly converged reaction time latency pattern, invariant over both occasions, in relation to the pattern exhibited by stranger dyads on at least the first conversational occasion.

I.4. Stranger dyads will show convergence on duration of utterance over occasions.

I.5. Stranger dyads will show convergence on duration of utterance over sections of the same conversation.

I.6. Friend dyads will exhibit a highly converged duration of utterance pattern, invariant over both occasions, in relation to the pattern exhibited by stranger dyads on at least the first converstional occasion.

I.7. The generated coefficients of congruence will corroborate the conclusions concerning the preceding six hypotheses made using absolute difference scores.

Second set of hypotheses:

II.1. Friend dyads will have shorter reaction time latencies than stranger dyads at least on the first con-

versational occasion.

On the basis of Kendon (1963) the following two specific predictions can be made:

II.2. Stranger dyad participants will exhibit an inverse relationship on duration of utterance, while friend dyad participants will exhibit a positive relationship on duration of utterance; and

II.3. There will be no difference in the total number of speaker turns that occur in conversations between friends and in conversations between strangers.

On the basis of Gallois and Markel (1975) the following two specific predictions can be made:

II.4. The beginning section of a conversation will have more speaker turns than the final section of the same conversation; and

II.5. The final section of a conversation will contain longer duration of utterance than the beginning section of the same conversation. With regard to hypothesis II.5., it should be noted that the data of Gallois and Markel (1975) was taken from only one interactant in a conversation. Thus for comparison purposes it becomes necessary to choose between using an average of the average duration of utterance of each conversationist or a sum of the average duration of utterance. It is obvious that these two measures are algebraically equivalent, however the sum of the averages

is conceptually clearer. It may be thought to represent the amount of time between when a participant of a given dyad once gained the speaking floor until he nexted regained the speaking floor, minus the intervening reaction time latencies. In view of this, the sum of the average duration of utterance will be examined in the present study. This measure will be referred to as the talk-silence average.

The final hypothesis is made regarding the Post Session Questionnaire developed by Kendon (1963) and used in the present study:

II.6. There will be some overall difference in the way that participants of friend dyads and stranger dyads evaluate their speaking partners.

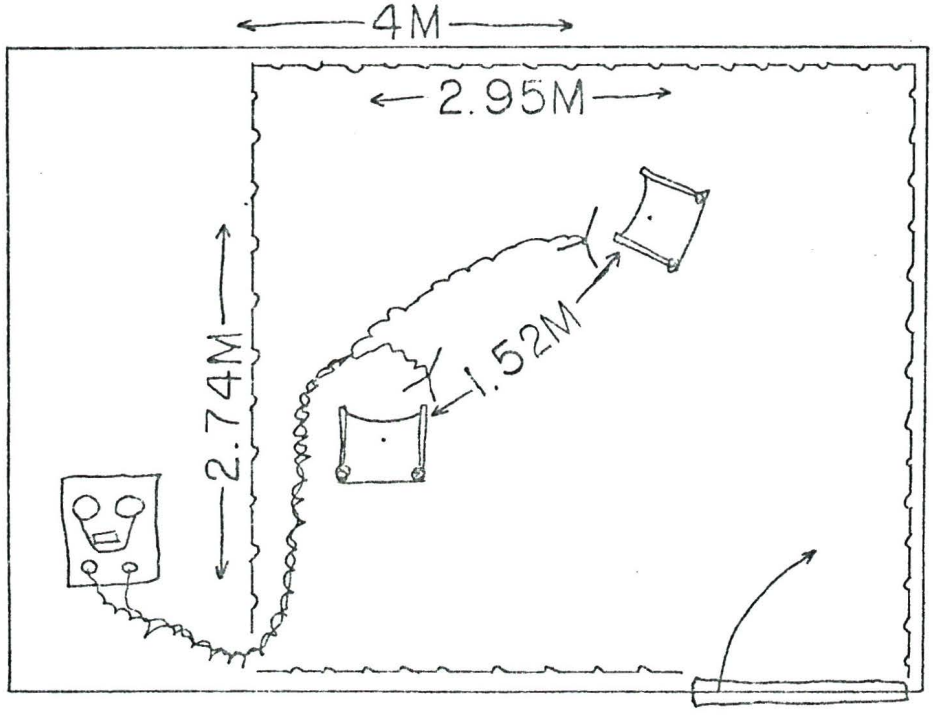
II METHOD

A. Subjects

The subjects were 40 females drawn from the university and surrounding communities between the ages of 17 and 41, having a mean age of 21.5. All subjects were unpaid and volunteered to participate in the study. All subjects as a criterion for participation said that they had a friend that they had known for six months or longer. Friend and stranger dyads were formed on the basis of random numbers assigned to subjects as they volunteered to participate. Thus if an odd number corresponded, the experimenter found a complete stranger to pair with the volunteer. If an even number corresponded, the experimenter asked the volunteer to bring a friend. A friend was defined as someone whose mutual acquaintance the volunteer had had for a minimum of six months. All volunteers complied with this request to bring a friend when asked to do so. In this fashion ten friend and ten stranger dyads were formed and used in the study. The recorded tape of the first occasion for one friend dyad was not used in the analysis as this dyad was unable to return for the agreed upon second conversational occasion. Another friend dyad was formed and run on two occasions to take their place.

B. Apparatus

The conversations between the pairs of subjects took place in a 2.74 by 2.95 meter room, with subjects in full view of each other. Subjects were seated in comfortable armchairs arranged in an intermediate affiliative position: the chairs faced each other at an angle of 80 degrees, placed five feet apart as measured from the center of the seat cushions (Rosenfeld, 1966) (see Figure 1). The room was acoustically dampened by placing cloth on the walls, and also cloth was used as a partition behind which the recording equipment was kept. In an effort to make the environment more comfortable and to promote conversation, three posters decorated the walls: a batik of a seascape, a large map of Vancouver Island, and a painting by S. Dali entitled "Visions of Africa". For recording purposes each subject spoke into her own Astatic 335H microphone, which was shielded with 1.5 inch foam to reduce crosstalk. Microphones were secured on floor stands and positioned 15 cm from the subject's head. The speech of each subject was fed into a separate channel of a Sony TC-650 stereo tape recorder and was recorded at a tape speed of 9.5 cm/sec. All timings of conversations and of subsequent processing was done on a Gra-Lab Universal Timer, Model 171. Recorded tapes were processed through a specially built stereo analog to digital



KEY:

= DOOR

= SEAT

= TAPE RECORDER

= MICROPHONE STANDS WITH LINES TO RECORDER

= SOUND DAMPENING MATERIAL

Figure 1. Diagram of the experimental room where all conversations were recorded.

converter, which was composed of a full-wave rectifier and a threshold detector (see Appendix A for a diagram of this instrument). The stereo analog was constructed such that there was zero hangover and no lag time. Thus this instrument was at full capacity immediately upon the presence of sound above the threshold and, correspondingly, immediately off at the cessation of such sound. The output of the stereo analog to digital converter was delivered into a two-channel Brush Instruments chart recorder. The chart recorder was run at a speed of 10 mm/sec.

C. Materials

The Post Session Questionnaire devised by Kendon (1963) was used to evaluate subject's impressions of each conversation and of their conversational partner. A copy of the questionnaire and its scoring procedure is included in Appendix B.

D. Procedure

Conversational codes to denote both the dyad and the occasion were recorded on the tape prior to the arrival of subjects. Upon arrival, the experimenter escorted the subjects into the experimental room, asked them to be seated and to make themselves comfortable and, for stranger dyads only, introduced the subjects to one another by first name.

Introduction sheets were then handed to each subject. (A sample of the introduction sheet is included in Appendix C.) The introduction sheet informed subjects that their only task was to converse freely on the topic of "current world events". The introduction made clear that this topic was as broad as they might wish to construe it. Also explained in the introduction was the necessity for the tape recording of the conversation and the necessity for them to remain seated at all times, while not moving their chairs in any way. Any questions concerning the instructions were then answered. Subjects were told that no smoking was allowed. In all cases the experimenter asked if they understood that their only task was to converse freely with their partner. Upon affirmative reply, recording levels were checked and set by having the subjects alternately say one of the sample topics listed on the introduction sheet, reading through the thirteen topics from top to bottom. Subjects were then told that their conversation would begin as soon as the experimenter left the room and closed the door, and that their conversation would end as soon as the experimenter would next re-enter the room. The tape recorder was then begun, and the experimenter began a timer set for exactly 45 minutes. Once the timer had stopped, the experimenter re-entered the room and told the subjects that their first (or second) conversation

was now concluded and that he had a questionnaire for them to complete. Following completion of the Post Session Questionnaires on the first occasion, all subjects were asked not to talk about the experiment, and all stranger dyad subjects were asked to make no attempt to see, meet, or talk with each other until they had returned for and completed their second and concluding experimental conversation. Following completion of the questionnaire on the second occasion, all subjects were debriefed concerning the nature and purpose of the present experiment.

Once all of the subjects had been run, the processing of the recorded tapes was begun. For each dyad on each occasion, the threshold level detector had to be set. This was done by sampling the output produced by the chart recorder at any threshold set and comparing this printed output against the verbal output from the tape recorder, audible via stero headphone. In all instances the selected threshold set was compromise between too much crosstalk and the lowest audible speech of either subject that would be printed by the chart recorder. Thresholds were set independently for both channels. In all cases the printed output was monitored by the experimenter and instances of crosstalk were manually eliminated. Braehler and Zenz (1975) mention how this subjective judgement necessary for setting the threshold makes untenable the ascertion of numerous

authors in the noncontent area that their data is completely objective. For any given threshold set, the exact same output is produced by the chart recorder for any number of passes of the same tape recorded conversation. Ninety-five per cent agreement was achieved in the monitored output produced by two consecutive passes of a pilot tape, yielding a reliability coefficient of .89. All tapes were processed into three equal 15-minute segments by use of a timer. Measurements of the noncontent speech parameters were taken manually from the printed chart recorder output. Measurement accuracy of 50 milliseconds was attained. Averages for each subject over a 15-minute period on a particular noncontent parameter were used as the raw data.

For purposes of data analysis, unless otherwise specified in the results section, the raw data on a particular noncontent measure was submitted to a three-way mixed analysis of variance. The between factor, having two levels (friend and stranger), was acquaintance. The two within factors were occasion and section, having two and three levels respectively. Analysis of variance was performed because the assumptions of a miltivariate analysis of variance could not be satisfied due to the small number of dyads run. Since it is likely that running an analysis of variance on repeated measures data will result in an optimistic F-test, it was decided that the epsilon

adjusted F-test (Greenhouse and Geiser, 1959) would be used in hypothesis testing throughout.

III RESULTS

A. First Set of Hypotheses

To test the first three hypotheses (I.1., I.2., and I.3) a three-way mixed analysis of variance was performed on the absolute difference scores by dyads on the RTL measure. The first hypothesis which predicted that strangers would show convergence over occasions was not confirmed. There was no significant difference found between the means of strangers for occasion one and occasion two. The second hypothesis was also not confirmed. Stranger dyads did not exhibit convergence within conversations. This was shown by a non-significant difference found on the simple effect of section at acquaintance level "stranger". The third hypothesis which predicted that friends in relation to strangers would exhibit a highly converged pattern over occasions was not confirmed. This was shown by the non-significant occasion by acquaintance interaction, by the non-significant acquaintance main effect, and by the non-significant simple main effect of acquaintance at section one. There were no significant differences found on any main effect or interaction in the overall analysis. (The raw data and complete analysis of variance for this and all subsequent analyses are presented in Appendix D.)

The fourth, fifth, and sixth hypotheses (I.4., I.5., and I.6.) were tested by performing a three-way mixed analysis of variance on the absolute difference scores by dyads on the DOU measure. The fourth hypothesis was not confirmed. That strangers did not show convergence over occasions was shown by a non-significant simple effect of occasion at acquaintance level "stranger". Similarly, the fifth hypothesis which predicted that strangers would show convergence within a conversation was not confirmed. Although a significant simple effect of section at acquaintance level "stranger" was found ($F(2,36) = 4.93$, $p < .025$), this effect showed that stranger dyads significantly diverged. Examination of the simple effects of section at acquaintance level "stranger" for each occasion showed that strangers significantly diverged only on the second occasion, although a pattern of divergence is clearly evident on the first occasion as well. The prediction that friends would exhibit a highly converged pattern in comparison to strangers was not found to be the case. This disconfirmation of the sixth hypothesis was shown by the non-significant differences obtained on the occasion by acquaintance interaction, on the acquaintance main effect, and on the simple main effect of acquaintance at section one. In the entire overall analysis there were no other significant effects present.

The purpose of the seventh hypothesis (I.7.) was to compare the conclusions reached concerning the first six hypotheses, as above, with those possible by the other major statistical method used by researchers to evaluate the degree of convergence of conversationists in dialogue. Using the absolute difference score analysis (Natale, 1975), we saw that none of the first six hypotheses were confirmed. The second method, developed by Jaffe and Feldstein (1970), involved doing intraclass correlations on the raw scores of conversational pairs for each section of each occasion. The "coefficients of congruence" so produced are evaluated with regard to their magnitude and direction. The significance of each correlation was tested by generating t-values (Hays, 1963, p. 529). Tables 1 and 2 show the coefficients of congruence obtained on the RTL measure and on the DOU measure, respectively, with significance levels as indicated. From Table 1 we can see that the first two hypotheses that strangers would show convergence both over occasions and over sections of the same conversation are not confirmed. Instead what is present is a highly converged pattern on RTL from the first section of the first occasion and throughout for strangers. That friends would exhibit a highly converged pattern on RTL throughout, the prediction of the third hypothesis, is likewise not found to be the case. Friend dyads exhibited a high degree of

TABLE 1

Coefficients of Congruence Obtained On The Reaction Time Latency Measure

	Occasion One			Occasion Two		
	S1	S2	S3	S1	S2	S3
Strangers	* .6193	*** .7215	** .6383	.4947	* .5829	** .6692
Friends	**** .8259	** .6898	.3400	**** .9102	**** .9186	.4001

* $p < .05$

** $p < .025$

*** $p < .01$

**** $p < .005$

TABLE 2

Coefficients of Congruence Obtained On The Duration of Utterance Measure

	Occasion One			Occasion Two		
	S1	S2	S3	S1	S2	S3
Strangers	-.2873	-.2059	-.2196	-.3197	-.4603	-.4716
Friends	-.1168	.1387	.1447	* .6246	** .6418	.5096

* $p < .05$

** $p < .025$

convergence in the first two sections of occasion one and particularly in the first two sections of occasion two, but exhibit a surprisingly weak amount of convergence in the third section of both occasions. Thus the friend pattern, although consistent, is not the highly converged pattern expected in relation to the pattern of strangers. Instead both groups exhibit significant convergence on RTL from the first section of the first occasion and sporadically throughout. From Table 2 it is obvious that strangers far from exhibiting convergence on DOU both over occasions (I.4.) and over sections of the same conversation (I.5.), instead exhibit a growing divergence on this measure. The sixth hypothesis was not confirmed as friend dyads did not exhibit a highly converged pattern invariant over both occasions on DOU. Likewise, only within occasion two do friend dyads display a markedly higher convergence in relation to that displayed by stranger dyads. Thus we see that both methods of calculating degree of convergence lead in similar fashion to the conclusion of not rejecting the null hypothesis on all of the first six hypotheses.

B. Second Set of Hypotheses

To test the first hypothesis (II.1.) a three-way mixed analysis of variance was performed on the RTL sum scores by dyads. This hypothesis predicted that friend dyads would

have shorter RTLs than stranger dyads at least on the first converstional occasion. This hypothesis was not confirmed as the obtained F-values for the acquaintance main effect and for the acquaintance by occasion interaction did not reach significance. In particular, the simple effect of acquaintance at occasion one proved to be non-significant. There were no significant differences present in the entire analysis of variance.

In order to test the second hypothesis (II.2.) it is necessary to look again at Table 2. From the correlations in Table 2, it is evident that stranger dyads do exhibit an inverse relationship on duration of utterance, which becomes particularly strong on the second conversational occasion. Similarly in line with the prediction of this hypothesis is the positive relationship on duration of utterance exhibited by friend dyads on the second occasion. A Z-test (Hays, 1963, p. 532) was used to test the significance of the differences in correlations obtained for friends and for strangers by section by occasion. This test revealed significant differences for sections one ($p < .025$), two ($p < .01$), and three ($p < .025$) of the second occasion. Thus this hypotheses was found partially confirmed.

Hypotheses three and four (II.3. and II.4.) will be looked at together as they both required examining the number of turns that occurred in the conversations. A three-way mixed analysis of variance was performed on the total number of speaker turns by dyads. The third hypothesis that there would be no difference in the number of speaker turns by acquaintance was confirmed by the obtained non-significant acquaintance main effect ($F(1,18) < 1$). The fourth hypothesis was found to be only partially confirmed. The overall analysis yielded a significant acquaintance by section interaction, $F(1.14, 20.53) = 5.99$, $p = 0.02$. The simple effect of section at acquaintance level "stranger" was found significant ($F(2,36) - 9.61$, $p < .001$). The means for this acquaintance by section interaction are shown in Table 3. A Tukey test of the means revealed that stranger dyads had significantly more turns in the beginning section than in the final section of conversation ($p < .05$). Thus while friend dyads did not exhibit any tendency for varying the number of turns over sections of conversation while in dialogue, stranger dyads did exhibit a significant tendency in line with the hypothesis. No other effects in the overall analysis of variance were found significant.

The fifth hypothesis (II.5.) predicted that the final section of a conversation would contain longer duration of utterance than the beginning section of the same conversation.

TABLE 3

Means Table for the Significant Acquaintance by Section Interaction Found on the Number of Speaker Turns

	Section One	Section Two	Section Three
Strangers	100.10	90.70	84.15
Friends	95.15	94.80	97.10

To test this hypothesis a three-way mixed analysis of variance was performed on the duration of utterance sum scores by dyads. The analysis revealed a significant three-way interaction, $F(1.30, 23.32) = 4.2701$, $p = 0.041$, which is presented in Figure 2. An examination of the simple interaction effect of occasion by section yielded no significant differences for friend dyads or for stranger dyads. However, the simple interaction effect of acquaintance by section proved to be significant at occasion one only ($F(2,36) = 7.50$, $p < .01$). Thus although friend and stranger dyads did not significantly change their talk/silence average over sections on the two occasions, they interacted significantly on the first occasion. A Tukey test showed that stranger dyads had a significantly shorter talk/silence average in the first section than the third section of the first conversational occasion ($p < .05$). The overall analysis also revealed a significant section main effect ($F(1.30,23.32) = 6.1624$, $p = 0.015$). The means for this effect are presented in Table 4. A Tukey test of the means revealed that the mean of the third section was significantly greater than the mean for the first section ($p < .05$). Thus the hypothesis is found to be only partially confirmed. Although the significant section main effect is in line with the original prediction, only stranger dyads on the first occasion were found to have significantly longer talk/

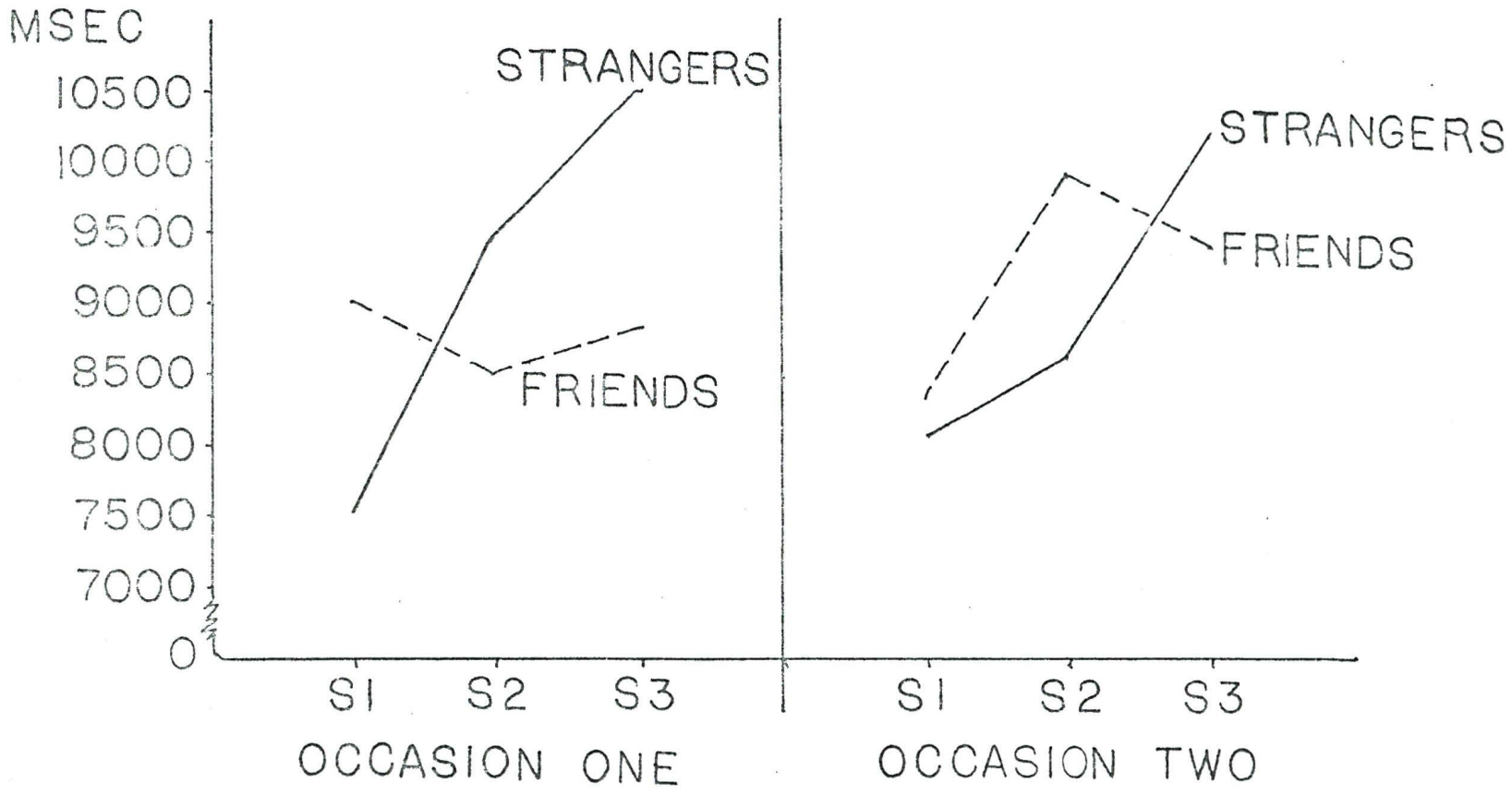


Figure 2. Duration of utterance sums analysis; significant acquaintance x occasion x section interaction.

TABLE 4

Means Table For the Significant Section Main Effect Found On The Talk/Silence Average (Duration of Utterance Sums Analysis) In Milliseconds

Section One	8261.54
Section Two	9129.32
Section Three	9726.86

silence averages in the final section than the beginning section of their conversations.

The results obtained from both the duration of utterance sums analysis and the number of reaction time latencies analysis, when taken together, suggest that the reason the duration of utterance sums are increasing over sections for stranger dyads is that they are correspondingly simply exchanging the floor less. In an attempt to anser this question, a correlation was performed on the data used for both of the prior analyses. The analysis yielded a weak, negative correlation, $\underline{r} = -.3056$, $p < .001$. From this correlation, we find that less than 10 per cent of the variance in the duration of utterance sum scores can be accounted for by variation in the number of reaction time latencies that were occurring. Thus these two measures can be considered relatively independent.

The final hypothesis (II.6.) predicted that friend and stranger dyad participants would evaluate their speaking partner in some overall differing way on the Post Session Questionnaire used in the present study. A four-way mixed (2x(2x7x2)) analysis of variance (acquaintance by occasion by question by subject) produced a significant (E-adjusted) question by acquaintance interaction ($F(1,18) = 4.969$, $p < .05$). The means and standard deviations of responses by friend and stranger dyad participants to each

question are presented in Table 5. To evaluate the magnitude of the differences in responding to the questions by friends and by strangers, seven separate acquaintance by occasion analyses of variance were performed (one for each question). A significant acquaintance main effect was detected only on responses to the seventh question ($f(1,18) = 15.94$, $p < .001$). This question read as follows, "If you had the opportunity to see more of your partner, do you feel that he (she) is the kind of person you would like to have as a friend?". Friend dyad participants without variation answered this question, "Yes, certainly", the most positive response possible, while stranger dyad participants answered this question, "Yes, to some extent". This significant difference found in response to the seventh question is taken as confirmation of the final hypothesis that some overall difference would be evident.

TABLE 5

Means and Standard Deviations of Responses to All Seven Questions on the Post Session Questionnaire

Question Number	Friend Participants		Stranger Participants	
	Mean	SD	Mean	SD
1	4.78	0.97	4.85	1.00
2	3.75	1.10	3.95	0.96
3	5.43	0.81	5.38	0.70
4	5.23	0.73	5.03	0.77
5	5.58	0.59	5.45	0.75
6	5.13	1.11	4.98	0.77
7	6.00	0.00	4.98	1.21

IV DISCUSSION

A. The Status of Models to Explain the Convergence Phenomena

The results of the present study fail to support the communication model proposed by Natale (1975) to explain the convergence of noncontent speech behavior. On both the reaction time latence measure and the duration of utterance measure stranger dyads were not found to show increasing convergence as a function of time spent in conversation either over or within occasions. On the contrary, stranger dyads were found to display a high degree of convergence on the reaction time latency measure from the first section of the first occasion and throughout. More clearly refuting this contention of the communication model, stranger dyads were found to display a growing divergence on the duration of utterance measure as a function of time spent in conversation. Thus Natale's generalization of his tentative finding concerning the acoustical measure of vocal intensity is not found to hold for either of the noncontent measures employed in the present study.

Furthermore, Natale's proposal that convergence occurs because the format or structure of the imput is used as the criterion by which a source structures the format of his

output to ensure the "intelligibility" of his speech is untenable as a general explanation for noncontent convergence in unstructured dialogue. Although the pattern displayed by stranger dyads on the reaction time latency measure is potentially in line with this theory, the pattern of stranger dyads on the duration of utterance measure is clearly at variance with this theory. When taken together this data results in the ludicrous proposition on the basis of this theory that while stranger dyads were attempting to ensure the "intelligibility" of their speech on the one measure (RTL), they were at the same time making their speech progressively less "intelligible" on the other measure (DOU). There is to be sure not even the slightest inclination in the literature to suppose that separate theories will be necessary to explain performance on individual noncontent measures.

Similarly, the hypothesis of the present study that friend dyads would display a highly converged pattern on both of the noncontent measures studied was not supported. This hypothesis was formed by reasoning that if greater convergence does occur as a function of time, then a high degree of convergence should be evident in the speech patterns of friends who can be assumed to have spent much time in mutual conversation. With regard to the reaction time latency measure, friend dyads displayed at times both a more highly

converged pattern and at times a less highly converged pattern than stranger dyads. This is clearly evident from the coefficients of congruence obtained on this measure. While it is possible that the extremely high coefficients of congruence found for friend dyads might be due to their having spent much time in conversation, how then can the communication model explain the two lowest coefficints of congruence obtained on this measure by either group that were found for friends in the final section on both occasions? Clearly these results are in disagreement with the greater convergence as a function of time notion of the communication model. This notion would seem to be rather simplistic in view of this finding of the present study. Similarly the pattern for friend dyads on the duration of utterance measure does not support the communication model. On this measure, friend dyads displayed the pattern anticipated for stranger dyads for the function of time notion to have been supported. Instead, in view of the growing divergence displayed by stranger dyads on this measure, it is highly unlikely that the convergence displayed by friend dyads on the second occasion is the result of their long history (time alone) as interactants in dialogue. (The greater convergence as a function of time notion is clearly not supported by the lack of convergence displayed by friend dyads on the first conversational occasion.) It would seem much more

likely that the convergence displayed by friends on this measure is relatable to the content of their dialogue and their mutual interest in talking to one another on those content topics. Also it is surely preposterous to assume that the dialogues of the friends were any less "intelligible" to the participants in those sections where low coefficients of congruence were found on either or both of these non-content measures. Thus in no way can any of the results obtained in the present study when taken together be seen as supporting the contentions of the communication model.

Since the communication model was conceived as an alternative explanation concerning the convergence phenomena to the synchrony model, it is interesting to ask if this earlier model is any better able to account for the data of the present study. To reiterate, the synchrony model was designed as an explanation for the very powerful convergence phenomena repeatedly demonstrated in the context of a standardized interview (Matarazzo and Wiens, 1972). Briefly summarized, the synchrony model posited that any greater interviewer behavior, such as longer duration of utterance and shorter reaction time latency, would be interpreted by the interviewee as demonstrating greater interest in or empathy toward him by the interviewer and result in correspondingly greater interviewee behavior to match (convergence) (Matarazzo and Wiens, 1967). Although the

present study was not designed to directly test the synchrony model, perusal of the obtained data would seem to cast serious doubt upon the model's ability to account for the findings. With regard to the reaction time latency measure, the model would seem incapable of explaining the three sections in which significant convergence (as shown by the obtained coefficients of congruence) was not observed in view of the fact that no significant differences were found on the reaction time latencies during those sections (as shown by the RTL sums analysis). If this sums analysis had shown substantially increased length in reaction time latency to have occurred in those sections, this finding would have been in line with the model. More convincing lack of support for the model comes from the data obtained on the duration of utterance measure. Although there were no between group differences found on the duration of utterance sums analysis on the second occasion, the two groups significantly differed with regard to degree of convergence on that occasion: stranger dyads increasingly diverged, while friend dyads were found at times to significantly converge. Thus while one member of a typical stranger dyad spoke in longer and longer duration of utterance, this did not have any positive effect on her partner that would dispose her partner to converge. Instead the exact opposite was seen to occur: her partner spoke in shorter and shorter duration of utterance.

With due respect to Matarazzo et al., who have never so much as implied that their model was applicable to anything but the interview situation, the synchrony model can be seen to fall drearily short of explaining the coefficients of congruence of the present study obtained from unstructured dialogues between peers.

It should be clear that both models have major difficulties in accounting for the magnitude of the coefficients of congruence on the noncontent measures obtained from the unstructured dialogues between peers of the present study. Simply stated, the problem involves the convergence notion itself. In the first place, in instructured dialogue there is no one who should, must, or otherwise will converge to his partner. In the standardized interview, the interviewee must converge to the interviewer if convergence is to be noted to have occurred. That the interviewee should converge, according to the synchrony model, is evident because of his appreciation of the interviewer's interest in him, empathy toward him, or valuation of him. This state of affairs is unimaginable in unstructured dialogue between peers. According to the communication model, the person who will be disposed to converge to his partner, with increased efficiency over time, will be the person seeking to gratify a need for approval (Natale, 1975). Hence Natale found that "the subjects evaluated as having more 'social

desirability'" (as measured by the Marlowe-Crowne Social Desirability Scale) "contributed more to the convergence of vocal intensity than did the subjects with low 'social desirability'" (Natale, 1975, p. 797). Since the present study, using two noncontent measures, failed to find any consistent convergence of the sort predicted by the communication model on both noncontent measures, it is meaningless to ask which individual participants had stronger or weaker tendencies to gratify a need for approval. If this type of personality variable is a correlate with convergence, how is it possible that this tendency could manifest itself with significant convergence on the one measure (RTL) but not on the other measure (DOU) at the same time, as was the case with strangers? Also, the lack of a consistent, significant convergence pattern over sections of a conversation might tend to suggest that the person high in 'social desirability' had a differentiated need for approval over sections of the same conversation. From these considerations it is becoming clear to this researcher that the notion of a "convergence phenomena" with regard to the noncontent aspects of speech applicable to unstructured dialogue is in need of serious scrutiny and probably isn't applicable at all. This leads us directly to another major problem with the convergence notion.

The second major problem with the convergence notion is the proclivity of virtually all researchers dabbling with it to load it with "meaningful" psychological interpretations, all personality related. Researchers have consistently assumed high coefficients of congruence (or the like) to be equivalent with "convergence", and have therefore concentrated their attention upon the psychological reasons behind this phenomena. This has created a smokescreen through which it is difficult to perceive where the real emphasis in the noncontent field should be placed. Quite germane at this point is a caution expressed by Braehler and Zenz (1975, p. 175): "Many of the correlations we have found have remained for a long time beyond our comprehension, yet we have become very sceptical of efforts to explain correlations between different statistics of on-off patterns in psychological terms . . . " If researchers in the field were to fully follow this line of reasoning, they might well find themselves pursuing a relatively less glamorous, but substantially more lasting productive line of enquiry into the structure of dialogue. As this field is still relatively young, it would be highly advisable for researchers to simply describe their findings. In this way an understanding of what constitute typical patternings in the sequencing of conversations for various situations and subsequently of how these various typical patterns are effected by experimental manipulation might be developed.

B. A Brief Description of the Conversations and Comparisons With Other Studies

When strangers opened thier conversations, they exchanged the speaking floor more than in the final section. They also had shorter talk/silence averages in the opening section than in the final section, that is, the interval of time between a participant's first acquiring the speaking floor until the next time she regained the floor (not including the intervening turn time) increased from the first to the final section. Taken in conjunction with the finding that the difference between the participants' utterance lengths became progressively more pronounced from the first section to the final section of their conversations and in particular on the second occasion, these findings suggest that strangers more equally shared the available speaking time in the beginning than in the end of their conversations. In colloquial terms, the more "talkative" participant progressively did more and more of the talking; the dialogue became progressively more like a monologue as more time elapsed both within and over occasions. Throughout, strangers exhibited no tendency to vary the average amount of time they spent occupied in turn taking. Likewise, what slight increases or decreases in turn taking time one participant exhibited, her partner had a consistent tendency to increase or decrease her turn taking time to match.

Friends were highly consistent in the number of exchanges of the speaking floor that occurred over sections of their conversations. Similarly, friends had stable talk/silence averages over sections of their conversations. On the first occasion, friend participants exhibited neither a negative nor a positive tendency with respect to matching one another on utterance length. On the second occasion, as one participant increased or decreased her utterance length, her partner had a tendency to increase or decrease her utternance length to match. It is not known what would account for this discrepancy in matching behavior on duration of utterance between the two occasions (more on this below). Nonetheless, since friends had stable talk/silence averages throughout, no matter how their individual variations in utterance length changed, the pattern of friends can be characterized as being very balanced. This is not to imply that friends can be described as having more or less equally shared the available speaking time, even though with respect to the stranger pattern this is certainly true. Rather with friends, whether they apportioned their speaking time equally or not, neither partner dominated the conversations by continuously holding the speaking floor. With regard to time spent in turn taking, friends showed no tendency to vary either over sections or over occasions in conversation. Similarly, what slight increases or decreases

one participant produced in turn taking time, her partner had a consistent tendency to increase or decrease her turn taking time to match. It is not known why this tendency is particularly weak in the final section on both occasions.

Two specific hypotheses of the present study were designed as replications of Kendon (1963). The first hypothesis predicted that strangers would exhibit an inverse relationship on utterance length, while friends would exhibit a positive relationship. This hypothesis was partially confirmed. Strangers did consistently exhibit an inverse relationship, which became stronger over occasions. Friends, however, only exhibited a consistently strong positive relationship on utterance length on the second occasion. These tendencies were found to be significantly different over sections of the second occasion. This finding not only partially replicates the work of Kendon (1963), it also tends to confirm the conclusion reached by Wiens et al. (1966) that a record of duration of utterance which eliminates all non-verbal gestures from analysis looses virtually no fidelity in comparison to the same conversation processed by an observer. This is evident if one recalls that Kendon (1963) did use observers to record the conversations in his study and the entire original Chapplian system which included verbal and nonverbal communications. The second hypothesis

predicted that there would be no difference between friends and strangers in their total number of speaker turns in conversation. This hypothesis was confirmed.

On the basis of Gallois and Markel (1975) two specific hypotheses were formulated. The first hypothesis predicted that the beginning section of a conversation would have more speaker turns than the final section of the same conversation. As only stranger dyads exhibited a significant tendency in line with the prediction, the hypothesis was only partially confirmed. The second hypothesis predicted that the final section of a conversation would contain longer duration of utterance than the beginning section of the same conversation. This hypothesis was likewise only partially confirmed. Although a significant section main effect in line with the prediction was found, the overall analysis revealed a significant section by acquaintance by occasion effect. Examination of this effect revealed that only stranger dyads on the first occasion had longer talk/silence averages in the final section than the beginning section of their conversation. The remarkable aspect of the partial confirmation of these hypotheses by only stranger dyads in the present study is that all the dyads in the Gallois and Markel (1975) study were composed of participants who were "well-acquainted"! As these researchers were not in the least concerned with affiliative distinctions and give no further

information concerning length and depth of acquaintance of their dyads, we might well ponder how "well-acquainted" their dyad participants in fact were. Aside from an obvious difference in intention from the present study, Gallois and Markel (1975) allowed their dyads to terminate their conversation (provided of course that the dyad had spoken at least this long), obtained from the very first, the exact middle, and the very last 5 minutes of the conversation. This sampling difference may well account for the discrepancy in findings herein noted, since their sampling technique can be understood to have enhanced the possibility of finding more clearcut differences by section. Also, in view of the fact that all participants in the Gallois and Markel (1975) study were males, a sex effect cannot entirely be ruled out, however unlikely this might seem.

It is also necessary to examine the status and implications of an inference made by the present study with regard to the work of Duncan (1972). It should be recalled that friends, in part, were expected to have smoother and quicker exchanges of the speaking floor on the basis of their assumed greater familiarity with each other's turn-yielding and turn-suppressing signals. That this was not found to be the case is clear from no difference being found between friends and strangers on the reaction time latency sums analysis and from the high coefficients of congruence

demonstrated by both groups on reaction time latency. If the assumption that those gestural signals are relatable to a measure of reaction time latency, which still seems highly likely, then it is clear that friends and strangers are not differentiatable on the basis of their use of those signals. This would not only suggest that those signals are common knowledge (that is, not highly idiosyncratic) to at least particular language group communities, but would also suggest that differentiations on the basis of reaction time latency between groups would not be possible.

The only study in the literature which purports to have found a difference attributable to differential congruence on reaction time latency is a study by Welkowitz and Kuc (1973). These researchers found that degree of congruence on switching pauses was significantly related to observer rated warmth between dyad participants (all dyads in their study were composed of strangers). However, since they found no relationship between dialogue participant rated warmth, empathy, and genuineness, or between observer rated empathy and genuineness and degree of switching pause congruence, we might well have cause to question the relationship they did find as being anything more than a spurious, chance finding. Similarly, since the present study found no discernible difference between the congruence of friends and strangers on this measure, we would have serious

reason to question any potential observer rated "warmth", in the present study, which would suggest that dyad participants in these groups did not show differential "warmth". Thus, we do not seriously take this study to be in disagreement with the above mentioned contention concerning differentiations being possible on the basis of the reaction time latency measure.

Furthermore, with Welkowitz, Cariffe, Feldstein (1976) having found that stranger dyads composed of either first or second grade-school age children were not differentiatable on the basis of switching pause congruence over two occasions, it would seem evident that learning to time well the delivery of conversational responses occurs at a very early age and may well be a concomitant of learning to converse in an understandable manner. This line of reasoning would tend to substantiate the belief of Miller (1963) that turn taking in a dialogue is a "language universal" and points to the importance of the signals described by Duncan (1972) being learned as early as one learns to converse. What the adequate learning of some sort of turn taking signals means is that any two individuals can, at first meeting, speak in such a way that makes dialogue possible.

C. Further Considerations

A description of the overall pattern displayed by strangers on the duration of utterance measure can surprisingly be understood within a framework proposed by Davis (1976, 1977) to describe intimacy level disclosure between members of stranger dyads. Davis found that his stranger dyads employed a strategy based upon role differentiation in working out a solution to the amount of disclosure of information of a more personal nature they would reveal to one another. Role differentiation was proposed to work in such a way "whereby members of a dyad allocate themselves implicitly to active and passive roles in structuring their encounter" (Davis, 1976, p. 791). Thus he found that the person who was in the active role consistently took the initiative in introducing the dyad to deeper levels of disclosure to which his partner reciprocated. Role differentiation into active and passive members would certainly seem an apt description for the allocation of available speaking time used by strangers in the present study. In the contrived circumstance of the experiment herein performed, stranger dyads can be seen to have filled the available time as they were instructed to do with speech. That one member tended over time to do most of this talking, with her partner reciprocating with short

utterances to take up the slack (as it were) and thereby maintain the dialogue format, is clear from the results previously described.

This similarity of strategy used by strangers in these two studies would seem to suggest that a possibly fruitful line of enquiry would be to examine the relationship between differing possible allocations of available speaking time and level of disclosure of information of a more personal nature. It is clear that friends allocated their available speaking time in a manner differing from strangers (with this difference being evident particularly on the second occasion; more on this below). It is also clear that "friends" were at one time "strangers". Yet the stranger dyads in the present study did not merely as a function of speaking time together tend to approximate the pattern of the friends. Although the strangers could not be defined as "strangers" in the strictest sense of that word on the second occasion, they would appear to be something less than "acquaintances" on that occasion as well. This is the case because it is not clear that they knew anything of importance about one another after having spoken together in the experiment. When any two strangers meet in natural circumstances they already share something of value to each: namely, what got them both into that circumstance at the same time so as to be able to meet (possibly a common interest). More commonly,

strangers meet through mutual acquaintances and share this relatively non-threatening common ground. Once strangers have such a shared basis of interest, it becomes possible for them to start becoming friends. Thus it is quite likely that, even within the contrived and very restrictive circumstance of the present experiment, there were some stranger dyads whose members found a real commonality of interest and whose dialogues did come to approximate the more balanced sharing of speaking time characteristic of friends. Thus a study which could effectively evaluate the personal involvement and commitment that each dyad member had in the topic contents discussed by the dyad might be in a position to notice changes in the dialogue pattern displayed by that stranger dyad as involvement and level of disclosure changed.

That such a study might be fruitful is also dependent upon a more thorough understanding of the dialogue pattern of friends. Only on the second conversational occasion in the present study is it clear that friends displayed the balanced pattern ascribed to them. It seems probable that the friend dyads were effected by the powerful and highly contrived circumstance for their dialogue on the first occasion and were therefore uncomfortable in the situation. Thus the situation served to disrupt their usual pattern of dialogue. This notion could easily be tested in either of

two ways: either several more speaking occasions could be run than was done in the present experiment, or conversations of friends could be recorded, probably surreptitiously, in a natural setting. In any event, a clearer notion of what is the dialogue pattern of friends, if only one pattern exists, would be an important contribution to the literature and would greatly facilitate the previously suggested line of enquiry.

The previously mentioned caution to avoid interpreting correlations obtained on noncontent measures in psychological terms need not be reiterated. However, given the necessity in this field of mechanically processing the speech samples from which any data is acquired, one final caution is in order: great care should be exercised in making the tape recordings of dialogues. Use of the best recording equipment possible is a necessity if cross-talk of the speech of one participant onto the channel of the other participant is to be eliminated or at very least kept to an absolute minimum. The most care needs to be exercised precisely at the point of first contact between the speech sound of a participant and the mechanical processing system, namely the microphone. If microphones are carefully selected and positioned, it should be possible to obtain only the speech of one participant per channel and still record the lowest speech sound production of that participant. An appropriately

acoustically dampened room is also necessary to facilitate proper recording of conversations. However, these aspects must be balanced with the need to ensure the relative naturalness of the recording environment and the comfort of the participants. Similarly, explicit details of the entire mechanical processing system must be carefully enunciated, so that problems of obtaining differing results based solely upon mechanical considerations can be avoided. In conclusion, there is ample evidence that properly done the study of noncontent aspects of speech can enrich our understanding of dialogue.

V BIBLIOGRAPHY

Argyle, M. The psychology of interpersonal behavior. London: Penguin Books, second edition, 1972.

Boomer, D.S. Hesitation and grammatical encoding. Language and Speech, 1965, 8, 148-158.

Brady, P.T. A technique for investigating on-off patterns of speech. Bell System Technical Journal, 1965, 44, No. 1, 1-22.

Brady, P.T. A statistical analysis of on-off patterns in 16 conversations. Bell System Technical Journal, 1968, 47A, 73-91.

Braehler, E. and Zenz, H. Artifacts in the registration and interpretation of speech process variables. Language and Speech, 1975, 18, 166-179.

Chapple, E.D. Measuring human relations: an introduction to the study of the interaction of individuals. Genetic Psychology Monographs, 1940, 22, No. 1, 3-147.

Chapple, E.D. Contributions of anthropology to institutional psychiatry. Human Organization, 1954, 13, No. 2, 11-15.

Chapple, E.D. Quantitative analysis of complex organizational systems. Human Organization, 1962, 21, No. 2, 67-80.

Chapple, E.D., Chapple, M.F. and Repp, J.A. Behavioral definitions of personality and temperment characteristics. Human Organization, 1955, 13, No. 4, 34-39.

Davis, J.D. Self-disclosure in an acquaintance exercise: responsibility for level of intimacy. Journal of Personality and Social Psychology, 1976, 33, No. 6, 787-792.

Davis, J.D. Effects of communication about interpersonal process on the evolution of self-disclosure in dyads. Journal of Personality and Social Psychology, 1977, 35, No. 1, 31-37.

Dittmann, A.T. and Llewellyn, L.G. The phonemic clause as a unit of speech decoding. Journal of Personality and Social Psychology, 1967, 6, No. 3, 341-349.

Dittmann, A.T. and Llewellyn, L.G. Relationship between vocalizations and head nods as listener responses. Journal of Personality and Social Psychology, 1968, 9, No. 1, 79-84.

Duncan, S. Some signals and rules for taking speaking turns in conversations. Journal of Personality and Social Psychology, 1972, 23, No. 2, 283-292.

Feldstein, S. Temporal patterns of dialogue: basic research and reconsiderations. In A.W. Siegman and B. Pope (Eds.), Studies in dyadic communication. New York: Pergamon Press, 1972.

Gallois, C. and Markel, N.H. Turn taking: social personality and conversational style. Journal of Personality and Social Psychology, 1975, 31, No. 6, 1134-1140.

Goldman-Eisler, F. On the variability of the speed of talking and on its relation to the length of utterances in conversation. British Journal of Psychology, 1954, 45, 94-107.

Goldman-Eisler, F. Psycholinguistics: experiments in spontaneous speech. New York: Academic Press, 1968.

Greenhouse, S.W. and Geiser, S. On methods in the analysis of profile data. Psychometrika, 1959, 24, 95-112.

Hays, W.L. Statistics. New York: Holt, Rinehart and Winston, 1963.

Heckel, R.V., Wiggen, S.L., and Salzberg, H.C. The effect of music tempo in varying operant speech levels in group psychotherapy. Journal of Clinical Psychology, 1963, 19, 129.

Jackson, R. and Pepinsky, H.B. Interviewer activity and status effects upon revealingness in the initial interview. Journal of Clinical Psychology, 1972, 28, 400-404.

Jaffe, J. and Feldstein, S. Rhythms of dialogue. New York: Academic Press, 1970.

Kendon, A. Temporal aspects of social performance in two-person encounters. Unpublished dissertation, Balliol College, Oxford, 1963.

Lane, H.L. and Tranel, B. The lombard reflex and the role of hearing in speech. Journal of Speech and Hearing Research, 1971, 14, 677-709.

Matarazzo, J.D., Hess, H.F. and Saslow, G. Frequency and duration characteristics of speech and silence behavior during interviews. Journal of Clinical Psychology, 1962, 18, 416-426.

Matarazzo, J.D., Saslow, G. and Matarazzo, R.G. The interaction chronograph as an instrument for objective measurement of interaction patterns during interviews. Journal of Psychology, 1956, 41, 347-367.

Matarazzo, J.D., Weitman, M., Saslow, G. and Wiens, A.N. Interviewer influence on durations of interviewee speech. Journal of Verbal Learning and Verbal Behavior, 1963, 1, 451-458.

Matarazzo, J.D., and Wiens, A.N. Interviewer influence on durations of interviewee silence. Journal of Experimental Research in Personality, 1967, 2, 56-69.

Matarazzo, J.D. and Wiens, A.N. The interview: research on its anatomy and structure. New York: Aldine-Atherton, 1972.

Matarazzo, J.D., Wiens, A.N. and Saslow, G. Studies of interview speech behavior. In Krasner and Ullmann (eds.), Research in behavior modification. New York: Holt, Rinehart and Winston, 1965.

Miller, G.A. Speaking in general. Review of J.H. Greenberg (ed.), Universals of language. Contemporary Psychology, 1963, 8, 417-418.

Naegele, K.D. Friendship and acquaintances: an exploration of some social distinctions. Harvard Educational Review, 1958, 23, No. 3, 232-252.

Natale, M. Convergence of mean vocal intensity in dyadic communication as a function of social desirability. Journal of Personality and Social Psychology, 1975, 32, No. 5, 790-804.

Norwine, A.C. and Murphy, O.J. Characteristic time intervals in telephonic conversation. Bell System Technical Journal, 1938, 17, 281-291.

Ray, M.L. and Webb, E.J. Speech duration effects in the kennedy conferences. Science, 1966, 153, 899-901.

Rosenfeld, H.M. Instrumental affiliative functions of facial and gestural expressions. Journal of Personality and Social Psychology, 1966, 4, No. 1, 65-72.

Rosenfeld, H.M. and Jackson, J. Temporal mediation of the similarity-attraction hypothesis. Journal of Personality, 1965, 33, 649-656.

Saslow, G. and Matarazzo, J.D. A technique for studying changes in interview behavior. In E. Rubinstein and M. Parloff (Eds.), Research in Psychotherapy. Washington, D.C.: American Psychological Association, 1959.

Shaw, M.E. and Sadler, O.W. Interaction patterns in heterosexual dyads varying in degree of intimacy. Journal of Social Psychology, 1965, 66, 345-351.

Soskin, W.F. and John, V.P. The study of spontaneous talk. In R.G. Barker (Ed.), The stream of behavior. New York: Appleton-Century-Crofts, 1963.

Webb, J.T. Interview synchrony: an investigation of two speech rate measures in an automated standardized interview. In A.W. Siegman and B. Pope (Eds.), Studies in dyadic communication. New York: Pergamon Press, 1972.

Welkowitz, J., Cariffe, G. and Feldstein, S. Conversational congruence as a criterion of socialization in children. Child Development, 1976, 47, No. 1, 269-272.

Welkowitz, J., Feldstein, S., Finkelstein, M. and Aylesworth, L. Changes in vocal intensity as a function of interspeaker influence. Perceptual and Motor Skills, 1972, 35, 715-718.

Welkowitz, J. and Kuc, M. Interrelationships among warmth, genuineness, empathy, and temporal speech patterns in interpersonal interaction. Journal of Consulting and Clinical Psychology, 1973, 41, No. 3, 472-473.

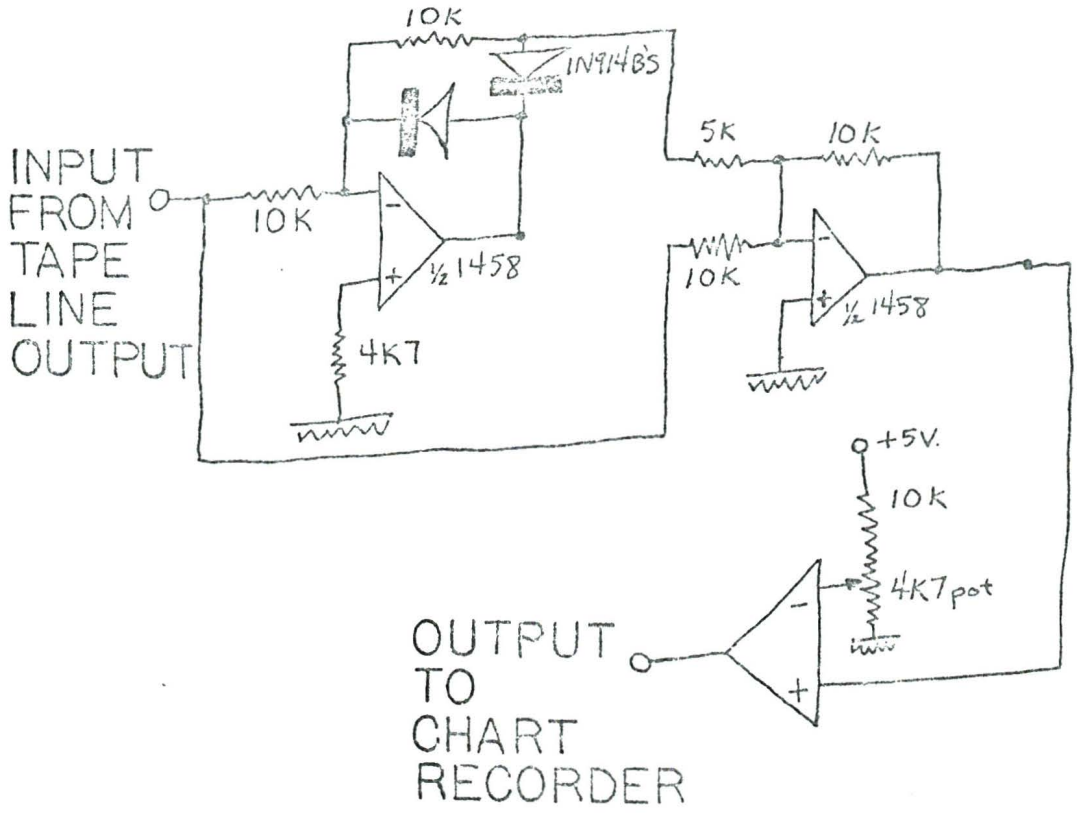
Wiens, A.N., Molde, D.A., Holman, D.C. and Matarazzo, J.D. Can interview interaction measures be taken from tape recordings? Journal of Psychology, 1966, 63, 249-260.

Wright, P.H. A model and a technique for studies of friendship. Journal of Experimental Social Psychology, 1969, 5, 295-309.

APPENDIX A

SCHEMATIC DIAGRAM OF THE STEREO ANALOG TO DIGITAL CONVERTER

ONLY ONE CHANNEL SHOWN:



NOTE: OUTPUT RISES TO +5 VOLTS IN THE PRESENCE OF A LARGE ENOUGH SOUND TO TURN ON ADJUSTABLE THRESHOLD DETECTOR

APPENDIX B

COPY OF THE POST SESSION QUESTIONNAIRE (KENDON, 1963) AS PRESENTED TO DIALOGUE PARTICIPANTS AND A COPY SHOWING THE SCORING PROCEDURE FOR THE QUESTIONNAIRE

Post Session Questionaire

PAIR CODE

OCCASION 1 or 2 (Circle Which)

Instructions. Here are a number of questions about the talk you have just had. Please answer each one by underlining those words in capitals which seem to you to state best what you feel about the talk you have just had.

1. How easy did you find it to think of things to say while you were talking?
   VERY EASY/ EASY/ FAIRLY EASY/ FAIRLY DIFFICULT/ DIFFICULT/ VERY DIFFICULT

2. Were you glad that the session was ended when it was, or were you sorry that it was ended when it was.
   VERY GLAD/ GLAD/ SLIGHTLY GLAD/ SLIGHTLY SORRY/ SORRY/ VERY SORRY

3. How was your partner, as someone to talk with?
   VERY EASY/ EASY/ FAIRLY EASY/ FAIRLY DIFFICULT/ DIFFICULT/ VERY DIFFICULT

4. How interested were you in the things you and your partner talked about?
   VERY BORED/ BORED/ SLIGHTLY BORED/ SLIGHTLY INTERESTED/ INTERESTED/ VERY INTERESTED

5. How much did you enjoy the talk you have just had?
   VERY MUCH/ SOMEWHAT/ A LITTLE/ NOT MUCH/ NOT VERY MUCH/ NOT AT ALL

6. If you had the opportunity, would you like to continue talking with your partner?
   WOULD CERTAINLY NOT LIKE TO/ WOULD NOT LIKE TO/ WOULD PREFER NOT TO/ WOULD LIKE TO A LITTL
   WOULD LIKE TO/ WOULD LIKE TO VERY MUCH

7. If you had the opportunity to see more of your partner, do you feel that he(she) is the kind of person you would like to have as a friend ?
   YES,CERTAINLY/ YES, TO SOME EXTENT/ YES, A LITTLE/ NO, NOT MUCH/ NOT NOT VERY MUCH/
   NO, NOT AT ALL

8. If you have any further comments or thoughts you wish to add, please write them out below, and on the back of this sheet, if necessary.

POST SESSION QUESTIONNAIRE

PAIR CODE

OCCASION 1 or 2 (Circle Which)

Instructions: Here are a number of questions about the talk you have just had. Please answer each one by underlining those words in capitals which seem to you to state best what you feel about the talk you have just had.

1. How easy did you find it to think of things to say while you were talking?

   VERY EASY/EASY/FAIRLY EASY/FAIRLY DIFFICULT/DIFFICULT/
   6 5 4 3 2
   VERY DIFFICULT
   1

2. Were you glad that the session was ended when it was, or were you sorry that it was ended when it was.

   VERY GLAD/GLAD/SLIGHTLY GLAD/SLIGHTLY SORRY/SORRY/VERY SORRY
   1 2 3 4 5 6

3. How was your partner, as someone to talk with?

   VERY EASY/EASY/FAIRLY EASY/FAIRLY DIFFICULT/DIFFICULT
   6 5 4 3 2

   VERY DIFFICULT
   1

4. How interested were you in the things you and your partner talked about?

   VERY BORED/BORED/SLIGHTLY BORED/SLIGHTLY INTERESTED/
   1 2 3 4

   INTERESTED/VERY INTERESTED
   5 6

5. How much did you enjoy the talk you have just had?

   VERY MUCH/SOMEWHAT/A LITTLE/NOT MUCH/NOT VERY MUCH/NOT AT ALL
   6 5 4 3 2 1

6. If you had the opportunity, would you like to continue talking with your partner?

WOULD CERTAINLY NOT LIKE TO/WOULD NOT LIKE TO/WOULD PREFER NOT TO
1 2 3

WOULD LIKE TO A LITTLE/WOULD LIKE TO/WOULD LIKE TO VERY MUCH
4 5 6

7. If you had the opportunity to see more of your partner, do you feel that he(she) is the kind of person you would like to have as a friend?

YES, CERTAINLY/YES, TO SOME EXTENT/YES, A LITTLE/
6 5 4

NO, NOT MUCH/NOT NOT VERY MUCH/NO, NOT AT ALL
3 2 1

8. If you have any further comments or thoughts you wish to add, please write them out below, and on the back of this sheet, if necessary.

* The score is simply the total of the weights of each category the participant underlined.

APPENDIX C

COPY OF THE INTRODUCTION SHEET PRESENTED TO EACH PARTICIPANT PRIOR TO EACH CONVERSATION

INTRODUCTION

This is an experiment concerning interpersonal communication. Your only experimental task will be to converse freely with your partner on the topic of "current world events". This topic was chosen to impose as few constraints in what you could talk about as possible. It was chosen to facilitate you and your partner in conversing freely. It is not meant to imply a conversation based exclusively on the current socio-political realities in the world, not does it imply talking only about things that have worldwide implications and/or significance. The following examples of facets of current world events should make clear that this topic is as broad as you might wish to construe it:

LIVING ACCOMODATOONS IN VICTORIA FOR STUDENTS
THE BASEBALL WORLD SERIES
THE ABILITY OF NATO TO MEET ANY SOVIET MILITARY THREAT
THE MANY WAYS OF FINANCING A COLLEGE EDUCATION
CAR CAMPING
THE NEW N.H.L. SEASON
THE CURRENT POLITICAL UPHEAVALS IN RED CHINA
JOB PROSPECTS FOR COLLEGE GRADUATES
BACKPACKING AND MOUNTAINEERING
THE U.S. PRESIDENTIAL ELECTIONS
DIFFERENCES AND SIMILARITIES BETWEEN HIGHSCHOOL AND COLLEGE
THE PROBLEMS AND PLEASURES OF DATING
THE QUALITY OF VICTORIA'S TWO DAILY NEWSPAPERS

These examples are presented solely as examples and not in any way as guidelines. It is not necessary to ponder and decide between you which facet of current world events in particular you will talk about. You must simply begin your conversation when told to do so, and continue conversing as freely as possible on some facet of current world events that you both might find interesting. You are to continue the conversation until your experimenter returns to end it (in about 60 minutes).

The conversation will be tape recorded. These recordings are essential for the conducting of this experiment, since most data will be extracted from them. These tapes will be exclusively used for testing the current research hypotheses and will be destroyed subsequently. Full anonymousness is guaranteed, since the only identification on the tape will be a single number denoting you and your partner as a pair. Throughout the conversation, you are asked to please remain seated and not move your chair as this is necessary for the recordings to be properly made.

Do you have any questions before we proceed with our equipment check?

PAIR CODE:

FIRST NAME ONLY:

TELEPHONE NUMBER:

NEXT SCHEDULED DATE AND TIME TO CONVERSE:

APPENDIX D

COMPLETE PRESENTATION OF ALL STATISTICAL TESTS AND THE RAW DATA FOR THE TESTS

Abbreviations appearing throughout Appendix D:

O = Occasion Effect

A = Acquaintance Effect

S = Section Effect

Conventions in the layout of the complete analysis of variance summary tables:

1) Above the unadjusted summary table is the result of the test for homogeneity of covariance. If the probability value of the Chi-squared is less than .050, then homogeneity of covariance is not present. The appropriate Greenhouse-Geisser E value is listed last following the symbols G-G.
2) Below the unadjusted summary table is the summary table for the Greenhouse-Geisser adjusted test with all within subjects effects listed, adjusted source and error degrees of freedom, respectively, listed, and adjusted probability values.
3) Below the Greenhouse-Geisser adjusted test results are all pertinent tests of simple effects and tests of means.

ANOVA SUMMARY TABLE FOR THE REACTION TIME LATENCY ABSOLUTE DIFFERENCE SCORES

Degrees of Freedom: 19
Chi-squared value: 45.3514
Probability value: 0.0006
G-G: 0.6154

SOURCE	DF	SS	MS	F	P
BETWEEN SUBJECTS					
A	1	1809.6333	1809.6333	0.0207	0.887
ERROR TERM	18	1572517.7000	87362.0944		
WITHIN SUBJECTS					
O	1	940.8000	940.8000	0.0200	0.889
AxO	1	5908.0333	5908.0333	0.1259	0.727
ERROR TERM	18	844826.5000	46934.8056		
S	2	83679.6500	41839.8250	2.0987	0.137
AxS	2	14081.8167	7040.9083	0.3532	0.705
ERROR TERM	36	717693.2000	19935.9222		
OxS	2	113259.0500	56629.5250	2.2319	0.122
AxOxS	2	24261.6167	12130.8083	0.4781	0.624
ERROR TERM	36	913436.0000	25373.2222		
TOTAL	119	4292414.0000	36070.7059		

G-G Adjusted Test:

SOURCE	DF		P
O	1.00	11.08	0.890
AxO	1.00	11.08	0.729
S	1.23	22.15	0.159
AxS	1.23	22.15	0.603
OxS	1.23	22.15	0.146
AxOxS	1.23	22.15	0.535

Simple effect of section at acquaintance level "stranger":

MS error AxS = 19936, df = 36
$MS_{S \text{ @ stranger}}$ = 14810.6
F(2,36) = 0.74, N.S.

Simple effect of occasion at acquaintance level "stranger":

MS error AxO = 46935, df = 18
$MS_{O \text{ @ stranger}}$ = 17346.05
F(1,18) = 0.37, N.S.

RTL ABSOLUTE DIFFERENCE SCORES ANALYSIS (continued)

Simple effect of acquaintance at section one:

MS error AxS = 19936, df = 36
$MS_{A \text{ @ section one}} = 6451.6$
$F(1,36) = 0.32$, N.S.

ANOVA SUMMARY TABLE FOR THE DURATION OF UTTERANCE ABSOLUTE DIFFERENCE SCORES

Degrees of Freedom:	19
Chi-squared value:	31.1610
Probability value:	0.0388
G-G:	0.6515

SOURCE	DF	SS	MS	F	P
BETWEEN SUBJECTS					
A	1	33584094.0750	33584094.0750	2.4234	0.137
ERROR TERM	18	49450397.7853	13858355.4325		
WITHIN SUBJECTS					
O	1	1383355.0803	1383355.0803	0.5212	0.480
AxO	1	530749.8030	530749.8030	0.2000	0.660
ERROR TERM	18	47772140.5333	2654007.8074		
S	2	33775365.4852	16887682.7426	3.6363	0.036
AxS	2	14131229.5635	7065614.7818	1.5214	0.232
ERROR TERM	36	67193209.1947	4644255.8110		
OxS	2	3083597.9032	1541798.9516	0.3991	0.674
AxOxS	2	4860811.6895	2430405.8447	0.6292	0.539
ERROR TERM	36	39065840.3907	3862940.0109		
TOTAL	119	94830791.5037	5838914.2143		

G-G Adjusted Test:

SOURCE	DF		P
O	1.00	11.73	0.484
AxO	1.00	11.73	0.663
S	1.30	23.46	0.059
AxS	1.30	23.46	0.236
OxS	1.30	23.46	0.588
AxOxS	1.30	23.46	0.476

Simple effect of occasion at acquaintance level "stranger":

MS error AxO = 2654008, df = 18
$MS_{O \text{ @ stranger}}$ = 300615.2
F(1,18) = 0.11, N.S.

Simple effect of section at acquaintance level "stranger":

MS error AxS = 4644256, df = 36
$MS_{S \text{ @ stranger}}$ = 22894826.02
F(2,36) = 4.93, $p < .025$

DOU ABSOLUTE DIFFERENCE SCORES ANALYSIS (continued)

Simple effect of section at acquaintance level "stranger", occasion one:

MS error AxOxS = 3862940, df= 36
$MS_{S \text{ @ stranger, occasion one}}$ =8508752.44
F(2,36) = 2.20, N.S.

Simple effect of section at acquaintance level "stranger", occasion two:

MS error AxOxS = 3862940, df= 36
$MS_{S \text{ @ stranger, occasion two}}$ = 15927593.7
F(2,36) = 4.12, p .025

Simple effect of acquaintance at section one:

MS error AxS = 4644256, df= 36
$MS_{A \text{ @ section one}}$ = 546156.9
F(1,36) = 0.12, N.S.

TESTS OF SIGNIFICANCE CONCERNING THE COEFFICIENTS OF CONGRUENCE

To test the significance of each coefficient of congruence, t-values were generated for each correlation obtained. The following formula, from Hays, 1963, p. 529, was used in the calculations of each t-value:

$$t = \frac{R_{xy}\sqrt{N-2}}{\sqrt{1-R_{xy}^2}},$$

with N = 10 in all cases and N - 2 = df for each t-value.

Using the RTL measure:

for STRANGERS:	Occasion One			Occasion Two		
	S. One	S. Two	S. Three	S. One	S. Two	S. Three
Correlation	.6193	.7215	.6383	.4967	.5829	.6692
t-value	2.23	2.95	2.35	1.62	2.03	2.55
Significance level	.05	.01	.025	N.S.	.05	.025
for FRIENDS:						
Correlation	.8259	.6898	.3400	.9102	.9186	.4001
t-value	4.14	2.69	1.02	6.22	6.57	1.23
Significance level	.005	.025	N.S.	.005	.005	N.S.

Using the DOU measure:

for STRANGERS:	Occasion One			Occasion Two		
	S. One	S. Two	S. Three	S. One	S. Two	S. Three
Correlation	-.2873	-.2059	-.2196	-.3197	-.4603	-.4716
t-value	-0.85	-0.60	-0.64	-0.95	-1.47	-1.51
Significance level	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.
for FRIENDS:						
Correlation	-.1168	.1387	.1447	.6246	.6418	.5096
t-value	-0.33	-0.40	-0.41	2.26	2.37	1.68
Significance level	N.S.	N.S.	N.S.	.05	.025	N.S.

To test the significance of the differences of the coefficients of congruence obtained for friend and for stranger dyads in a particular section of the same conversation, a Zed transformation test was performed. The following formula, from Hays, 1963, p. 532, was used in the calculations of each Z-value:

$$Z = \frac{Z_1 - Z_2}{\sigma_{(Z_1 - Z_2)}},$$

with N = 10 and $\sigma = \sqrt{\frac{1}{N_1 - 3} + \frac{1}{N_2 - 3}} = 0.53$ for all comparisons.

TESTS OF COEFFICIENTS OF CONGRUENCE (continued)

Using the RTL measure:

	Occasion One			Occasion Two		
	S. One	S. Two	S. Three	S. One	S. Two	S. Three
Z-value	0.8419	0.1194	0.7496	1.8409	1.7034	0.7242
Significance level	N.S.	N.S.	N.S.	.05	.05	N.S.

Using the DOU measure:

	Occasion One			Occasion Two		
	S. One	S. Two	S. Three	S. One	S. Two	S. Three
Z-value	0.3366	0.6509	0.6398	1.9889	2.3552	2.0117
Significance level	N.S.	N.S.	N.S.	.025	.01	.025

ANOVA SUMMARY TABLE FOR THE REACTION TIME LATENCY SUM SCORES

Degrees of Freedom:	19
Chi-squared value:	31.5589
Probability Value:	0.0350
G-G:	0.6278

SOURCE	DF	SS	MS	F	P
BETWEEN SUBJECTS					
A	1	952.0333	952.0333	0.0007	0.979
ERROR TERM	18	25185594.7667	1399199.7093		
WITHIN SUBJECTS					
O	1	328653.3333	328653.3333	3.1318	0.094
AxO	1	58697.6333	58697.6333	0.5595	0.464
ERROR TERM	18	1888935.0333	104940.8352		
S	2	235667.0167	117833.5083	1.3359	0.276
AxS	2	208794.3167	104397.1583	1.1836	0.318
ERROR TERM	36	3175433.3333	88206.4815		
OxS	2	590597.2167	295298.6083	2.1319	0.133
AxOxS	2	43683.3167	21841.6583	0.1577	0.855
ERROR TERM	36	4986561.4667	138515.5963		
TOTAL	119	36703569.4667	308433.3569		

G-G Adjusted Test:

SOURCE	DF		P
O	1.00	11.30	0.104
AxO	1.00	11.30	0.470
S	1.26	22.60	0.269
AxS	1.26	22.60	0.302
OxS	1.26	22.60	0.155
AxOxS	1.26	22.60	0.752

Simple effect of acquaintance at occasion one:

MS error AxO = 104940.8, df = 18

$MS_{A \text{ @ occasion one}} = 37300.27$

$F(1,18) = 0.36$, N.S.

ANOVA SUMMARY TABLE FOR THE NUMBER OF REACTION TIME LATENCIES ANALYSIS

Degrees of Freedom:	19
Chi-squared value:	29.1886
Probability value:	0.0631
G-G:	0.5703

SOURCE	DF	SS	MS	F	P
BETWEEN SUBJECTS					
A	1	488.0333	488.0333	0.1167	0.737
ERROR TERM	18	75292.6333	4182.9241		
WITHIN SUBJECTS					
O	1	73.6333	73.6333	0.2239	0.642
AxO	1	136.5333	136.5333	0.4151	0.528
ERROR TERM	18	5920.5000	328.9167		
S	2	1030.4167	515.2083	3.8501	0.031
AxS	2	1602.1167	801.0583	5.9862	0.006
ERROR TERM	36	4817.4667	133.8185		
OxS	2	164.1167	82.0583	0.6895	0.508
AxOxS	2	672.8167	336.4083	2.8267	0.072
ERROR TERM	36	4284.4000	119.0111		
TOTAL	119	94482.6667	793.9720		

G-G Adjusted Test:

SOURCE	DF		P
O	1.00	10.26	0.646
AxO	1.00	10.26	0.534
S	1.14	20.53	0.059
AxS	1.14	20.53	0.020
OxS	1.14	20.53	0.434
AxOxS	1.14	20.53	0.104

Simple effect of section at acquaintance level "stranger":

MS error AxS = 133.8, df = 36

$MS_{S \text{ @ stranger}} = 1285.55$

$F(2,36) = 9.61$, $p < .001$

Tukey test of the means of the AxS interaction:

for Strangers:	S3	S2	S1	r	critical .05
	81.15	90.70	100.10		
S3	-----	6.55	15.95*	3	12.66
S2		-----	9.40	3	12.66

for Friends:	S2	S1	S3	r	critical .05
	94.80	95.15	97.10		
S2	-----	0.35	2.30	3	12.66
S1		-----	1.95	3	12.66

ANOVA SUMMARY TABLE FOR THE DURATION OF UTTERANCE SUM SCORES

Degrees of Freedom:	19
Chi-squared value:	40.9765
Probability value:	0.0024
G-G:	0.6477

SOURCE	DF	SS	MS	F	P
BETWEEN SUBJECTS					
A	1	44656.3501	44656.3501	0.0009	0.976
ERROR TERM	18	99597297.0862	49977627.6159		
WITHIN SUBJECTS					
O	1	309179.1601	309179.1601	0.0610	0.808
AxO	1	2675008.1021	2675008.1021	0.5275	0.477
ERROR TERM	18	91272390.9495	5070688.3861		
S	2	43430172.4815	21715086.2408	6.1624	0.005
AxS	2	23447511.2732	11723755.6366	3.3270	0.047
ERROR TERM	36	26857659.4553	3523823.8738		
OxS	2	854072.1102	427036.0551	0.2182	0.805
AxOxS	2	16710443.1052	8355221.5526	4.2701	0.022
ERROR TERM	36	70440948.7080	1956693.0197		
TOTAL	119	75639338.7813	10719658.3091		

G-G Adjusted Test:

SOURCE	DF	P
O	1.00 11.66	0.809
AxO	1.00 11.66	0.482
S	1.30 23.32	0.015
AxS	1.30 23.32	0.072
OxS	1.30 23.32	0.707
AxOxS	1.30 23.32	0.041

Simple interaction effect of occasion by section at acquaintance level "stranger":

MS error AxOxS = 1956693, df = 36
$MS_{OxS \text{ @ stranger}} = 2512930.8$
F(2,36) = 1.28, N.S.

Simple interaction effect of occasion by section at acquaintance level "friend":

MS error AxOxS = 1956693, df = 36
$MS_{OxS \text{ @ friend}} = 6268472.0$
F(2,36) = 3.20, N.S.

DOU SUM SCORES ANALYSIS (continued)

Simple interaction of acquaintance by section at occasion one:

MS error AxOxS = 1956693, df = 36
$MS_{AxS \text{ @ occasion one}}$ = 14677956.35
F(2,36) = 7.50, p < .01

Simple interaction of acquaintance by section at occasion two:

MS error AxOxS = 1956693, df = 36
$MS_{AxS \text{ @ occasion two}}$ = 5400601.35
F(2,36) = 2.76, N.S.

Tukey test of the acquaintance by section interaction at occasion one using treatment sums:

for strangers at occasion one:

	Section One	Section Two	Section Three	r	critical .05
	75176	94494	105042		
Section One	-----	19318	29866*	3	21852
Section Two		-----	10548	3	21852

for friends at occasion one:

	Section Two	Section Three	Section One	r	critical .05
	85053	88397	91146		
Section Two	-----	3344	6093	3	21852
Section Three		-----	2749	3	21852

Tukey test of the significant section main effect using treatment sums:

	Section One	Section Two	Section Three	r	critical .05
	330461	365172	389074		
Section One	------	34711	58613*	3	40960
Section Two		------	23902	3	40960

ANOVA SUMMARY TABLE FOR THE ENTIRE QUESTIONNAIRE DATA SET

NOTE: An acquaintance by occasion by question by subject analysis of variance was performed to see if some overall difference was present in the entire data set. The subject factor represents an arbitrary designation of the members of a pair as subject one and subject two. It was necessary to include this factor so that any variations in the entire data set could be detected. However since this factor was arbitrarily constructed, all effects involving this factor are meaningless. Whereas this analysis showed some overall difference to be present in the answers given to the questions on the basis of acquaintance, it was deemed appropriate to do separate analyses of variance on each question. For these seven analyses of variance the replies of each member of a pair were summed for each question on each occasion as only differences by acquaintance were of interest.

SOURCE	DF	SS	MS	F	P	Greenhouse-Geisser Conservative Test DF/DF	P
BETWEEN SUBJECTS							
A	1	4.64	4.64	0.712	0.4098		
ERROR TERM	18	117.39	6.52				
WITHIN SUBJECTS							
O	1	4.64	4.64	3.729	0.0694		
AxO	1	0.04	0.04	0.036	0.8520		
ERROR TERM	18	22.42	1.25				
Q	6	162.24	27.04	42.673	0.0000	1/18	.001
AxQ	6	18.89	3.15	4.969	0.0002	1/18	.05
ERROR TERM	108	68.44	0.63				
S	1	0.79	0.79	0.380	0.5453		
AxS	1	0.02	0.02	0.008	0.9308		
ERROR TERM	18	37.30	2.07				
OxQ	6	5.69	0.95	3.557	0.0030	1/18	N.S.
AxOxQ	6	2.64	0.44	1.651	0.1400		
ERROR TERM	108	28.81	0.27				
OxS	1	0.94	0.94	0.488	0.4939		
AxOxS	1	3.00	3.00	1.549	0.2292		
ERROR TERM	18	34.88	1.94				
QxS	6	2.30	0.38	1.009	0.4232		
AxQxS	6	0.82	0.14	0.360	0.9024		
ERROR TERM	108	41.02	0.38				

(continued)

ENTIRE QUESTIONNAIRE DATA SET ANALYSIS (continued)

SOURCE	DF	SS	MS	F	P
OxQxS	6	1.59	0.27	0.758	0.6049
AxOxQxS	6	1.99	0.33	0.944	0.4667
ERROR TERM	108	37.85	0.35		
TOTAL	559	598.36	1.07		

Anova summary table for question # 1:

SOURCE	DF	SS	MS	F	P
BETWEEN SUBJECTS					
A	1	0.2250	0.2250	0.0502	0.825
ERROR TERM	18	80.6500	4.4806		
WITHIN SUBJECTS					
O	1	9.0250	9.0250	8.3522	0.010
AxO	1	0.0250	0.0250	0.0231	0.881
ERROR TERM	18	19.4500	1.0806		
TOTAL	39	109.3750	2.8045		

Anova summary table for question # 2:

SOURCE	DF	SS	MS	F	P
BETWEEN SUBJECTS					
A	1	1.6000	1.6000	0.4737	0.500
ERROR TERM	18	60.8000	3.3778		
WITHIN SUBJECTS					
O	1	10.0000	10.0000	7.3770	0.014
AxO	1	1.6000	1.6000	1.1803	0.292
ERROR TERM	18	24.4000	1.3556		
TOTAL	39	98.4000	2.5231		

ENTIRE QUESTIONNAIRE DATA SET ANALYSIS (continued)

Anova summary table for question # 3:

SOURCE	DF	SS	MS	F	P
BETWEEN SUBJECTS					
A	1	0.2250	0.2250	0.0857	0.773
ERROR TERM	18	47.2500	2.6250		
WITHIN SUBJECTS					
O	1	1.2250	1.2250	3.9027	0.064
AxO	1	0.6250	0.6250	1.9912	0.175
ERROR TERM	18	5.6500	0.3139		
TOTAL	39	54.9750	1.4096		

Anova summary table for question # 4:

SOURCE	DF	SS	MS	F	P
BETWEEN SUBJECTS					
A	1	0.4000	0.4000	0.1420	0.711
ERROR TERM	18	50.7000	2.8167		
WITHIN SUBJECTS					
O	1	0.1000	0.1000	0.0684	0.797
AxO	1	1.6000	1.6000	1.0951	0.309
ERROR TERM	18	26.3000	1.4611		
TOTAL	39	79.1000	2.0282		

Anova summary table for question # 5:

SOURCE	DF	SS	MS	F	P
BETWEEN SUBJECTS					
A	1	0.6250	0.6250	0.3647	0.553
ERROR TERM	18	30.8500	1.7139		
WITHIN SUBJECTS					
O	1	0.0250	0.0250	0.0295	0.866
AxO	1	0.2250	0.2250	0.2656	0.613
ERROR TERM	18	15.2500	0.8472		
TOTAL	39	46.9750	1.2045		

ENTIRE QUESTIONNAIRE DATA SET ANALYSIS (continued)

Anova summary table for question #6:

SOURCE	DF	SS	MS	F	P
BETWEEN SUBJECTS					
A	1	0.9000	0.9000	0.2169	0.647
ERROR TERM	18	74.7000	4.1500		
WITHIN SUBJECTS					
O	1	0.4000	0.4000	0.3770	0.547
AxO	1	2.5000	2.5000	2.3560	0.142
ERROR TERM	18	19.1000	1.0611		
TOTAL	39	97.6000	2.5026		

Anova summary table for question #7:

SOURCE	DF	SS	MS	F	P
BETWEEN SUBJECTS					
A	1	42.0250	42.0250	15.9420	0.001
ERROR TERM	18	47.4500	2.6361		
WITHIN SUBJECTS					
O	1	0.2250	0.2250	3.8571	0.065
AxO	1	0.2250	0.2250	3.8571	0.065
ERROR TERM	18	1.0500	0.0583		
TOTAL	39	90.9750	2.3327		

RAW DATA USED IN ALL ANALYSES INVOLVING THE REACTION TIME LATENCY MEASURE. THE NUMBERS ARE THE MEANS FOR A GIVEN PARTICIPANT IN A GIVEN SECTION ON A GIVEN OCCASION AND ARE IN MILLISECONDS.

			Occassion One			Occasion Two		
Acq.	Pair	Partner	Section One	Section Two	Section Three	Section One	Section Two	Section Three
STRANGERS	03	A	1133	1591	2093	1656	1400	1478
		B	793	1094	840	1094	1099	1186
	05	A	621	747	540	604	560	753
		B	602	587	595	426	587	665
	25	A	776	776	812	1098	905	791
		B	683	682	560	674	787	743
	01	A	565	440	381	552	649	807
		B	521	502	475	488	648	704
	19	A	523	846	448	626	727	545
		B	700	929	355	766	768	406
	23	A	538	500	514	473	623	608
		B	691	758	620	600	571	733
	13	A	894	862	1277	842	1111	609
		B	765	701	893	1091	1205	919
	15	A	816	1048	1041	802	914	608
		B	815	1361	1094	1362	1772	910
	43	A	582	546	416	1078	724	580
		B	352	430	546	879	408	334
	37	A	590	676	667	914	817	620
		B	558	734	794	903	785	769
FRIENDS	12	A	472	837	515	527	176	410
		B	474	888	603	819	385	651
	48	A	326	273	280	560	586	341
		B	530	357	320	647	518	340
	04	A	1648	1195	1480	1277	1555	801
		B	1351	1121	679	1456	1022	829
	14	A	719	606	674	948	632	848
		B	825	914	844	1064	811	830

RAW DATA FOR REACTION TIME LATENCY MEASURE (continued)

Acq.	Pair	Partner	Occasion One			Occasion Two		
			Section One	Section Two	Section Three	Section One	Section Two	Section Three
FRIENDS	22	A	850	912	1015	514	342	483
		B	460	547	398	415	560	549
	02	A	760	509	565	653	649	636
		B	741	810	835	812	681	758
	10	A	585	1001	880	799	392	683
		B	737	912	1256	1117	522	1279
	46	A	666	691	685	724	676	710
		B	574	591	620	721	765	534
	32	A	909	566	685	873	1320	607
		B	866	489	894	1036	1418	1117
	16	A	843	740	1157	952	1666	1072
		B	1040	776	1289	1258	1478	794

RAW DATA USED IN ALL ANALYSES INVOLVING THE DURATION OF UTTERANCE MEASURE. THE NUMBERS ARE THE MEANS FOR A GIVEN PARTICIPANT IN A GIVEN SECTION ON A GIVEN OCCASION AND ARE IN MILLISECONDS.

			Occasion One			Occasion Two		
Acq.	Pair	Partner	Section One	Section Two	Section Three	Section One	Section Two	Section Three
STRANGERS	15	A	4728	6828	9836	7004	3987	12108
		B	2257	2152	3207	1917	3907	2452
	43	A	4020	4526	7116	6115	1949	4105
		B	3486	3753	4564	2911	7252	5279
	23	A	2326	3597	3697	1941	3109	2262
		B	3071	3008	3075	3566	2939	2979
	13	A	6425	6604	7188	4037	3495	4407
		B	2338	3918	3549	5538	7669	6952
	25	A	4945	6261	5663	4398	6489	5262
		B	1686	1583	1739	2160	1316	1934
	05	A	4837	2654	3733	4670	4423	2780
		B	3348	5534	5245	3180	3643	5087
	03	A	2402	2748	3231	3355	3718	4355
		B	3502	4911	5093	5791	5530	6256
	19	A	3065	4958	4632	5519	3562	835
		B	6569	12419	13172	4721	9140	17313
	01	A	6892	9931	11494	4653	6394	5646
		B	3766	3202	3635	3878	3034	3775
	37	A	2482	2886	2197	2861	2192	1910
		B	2980	3021	4977	2693	2506	3902
FRIENDS	16	A	2421	2153	2593	3960	4157	3080
		B	3898	4134	4026	3677	4584	6775
	46	A	3202	3489	3220	4196	3943	5103
		B	5396	5452	9042	4141	3644	5649
	10	A	11571	5669	9920	8835	12652	11062
		B	2878	5525	6022	4734	7529	8684
	22	A	6271	7151	3007	3656	2681	1611
		B	4808	2082	2955	3705	3085	3894

RAW DATA FOR DURATION OF UTTERANCE MEASURE (continued)

Acq.	Pair	Partner	Occasion One			Occasion Two		
			Section One	Section Two	Section Three	Section One	Section Two	Section Three
FRIENDS	02	A	4901	3440	5069	2725	4435	4600
		B	2973	2711	1804	2924	2164	1684
	12	A	4996	6740	3503	3598	2478	2409
		B	4499	4288	4784	4546	5489	5672
	32	A	8377	5652	7991	5504	11032	6292
		B	4055	4322	4104	4860	4998	3934
	48	A	2705	2826	2864	1666	3359	3737
		B	2330	1708	1770	2342	1981	1663
	14	A	2452	2311	2996	2534	5947	2803
		B	3576	3912	4318	4111	4587	3980
	04	A	5505	6649	3515	7524	5374	6185
		B	4331	4839	4795	3931	5853	5371

RAW DATA USED IN ALL ANALYSES INVOLVING THE NUMBER OF SPEAKER SWITCHES. THE NUMBERS REPRESENT THE NUMBER OF TIMES THAT THE DYAD EXCHANGED THE SPEAKING FLOOR IN A GIVEN SECTION OF A GIVEN OCCASION. IF EACH PARTICIPANT OF A DYAD HAD NOT GAINED THE FLOOR THE SAME NUMBER OF TIMES, THE HIGHER NUMBER OF SPEAKER SWITCHES WAS CHOSEN.

		Occasion One			Occasion Two		
Acq.	Pair	S. One	S. Two	S. Three	S. One	S. Two	S. Three
STRANGERS	03	113	87	81	76	77	69
	05	95	94	98	103	97	97
	25	109	98	103	108	95	104
	01	77	66	56	94	87	82
	19	83	48	49	77	64	48
	23	135	114	116	133	124	143
	13	86	80	66	79	68	61
	15	102	80	59	81	85	56
	43	107	104	70	84	85	89
	37	138	120	107	122	141	129
FRIENDS	02	126	115	126	96	120	110
	10	58	69	51	58	43	47
	46	91	92	66	91	107	76
	32	64	82	68	73	49	77
	16	109	116	99	91	76	77
	48	152	173	178	172	141	152
	04	70	65	85	64	64	68
	14	120	115	101	103	76	108
	22	73	85	123	111	131	136
	12	87	71	96	94	106	98

VITA

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NON-CONTENT ASPECTS OF FACE-TO-FACE INTERACTION BETWEEN FRIEND AND STRANGER DYADS

Author: [redacted]

WAYNE RICHARD SKLARSKI

June 6, 1978