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Temporal Patterns of Speech in Acquaintance and Bargaining Dialogues

Bastian Kruidenier

Thesis Presented to the School of Graduate Studies
of the University of Ottawa
as Partial Fulfillment of the Requirements
for the Degree of Master of Arts in Psychology

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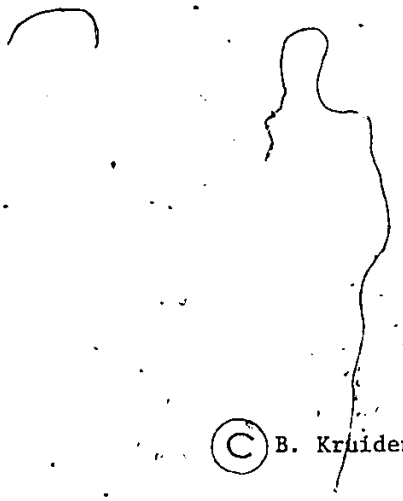

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Abstract

Temporal Patterns of Speech
in Acquaintance and Bargaining Dialogues

Bastian Kruidenier
University of Ottawa, 1979

The present research was meant to investigate the temporal patterns of speech and silence of individuals involved in an acquaintance and a bargaining conversation. Sixty college women, randomly assigned to form 30 dyads were asked to complete each task with their respective partners. For half the dyads, the acquaintance task was completed first, while this order was reversed for the other half. Correlational analysis showed that, while measures of the subject's temporal speech patterns were stable within the two tasks, they tended to vary considerably between the tasks. Subsequent analyses of variance showed that this variation was due to the acquaintance task being characterized by greater individual and dyadic activity than the bargaining conversation. These results are contrary to what would be expected on the basis of previous findings and are discussed in terms of the emotional impact of different tasks on speech patterns. Measures of intimacy and influence related to the acquaintance and bargaining tasks, respectively, were factor analyzed together with the temporal speech measures from each task. These analyses were undertaken to investigate the possible effect of speech patterns on the outcome of each task. While no appreciable relationships were obtained between influence and

speech patterns, intimacy was related to relatively short utterances and latency of reply. The proposed interpretation suggests that the member of a dyad who appears more intimate is the one who evidences a rhythm of speech more supportive of the partner's vocalizations.

Introduction

The way a person says something is often considered to be as important as what the person says. Regarding the psychiatric interview, for example, Sullivan (1954) has said that "much attention may profitably be paid to the telltale aspects of intonation, rate of speech, difficulty in enunciation, and so on...the non-verbal but nevertheless vocal aspects of the exchange" (p. 5). There has been a recent surge of interest in the study of the non-verbal and para-verbal--the "non-verbal but nevertheless vocal"--aspects of communication (see Key, 1977). The former includes such things as body movement and posture, gaze behavior, and facial expression. Para-verbal behavior includes speech loudness, intonation, inflection, and rhythm.

The study of the rhythm of speech has been restricted mainly to dyadic communication. This area of study attempts to describe the temporal patterning of the individual's speech sounds and silences in the dialogue (Jaffe and Feldstein, 1970). This includes the basic rhythm of conversational exchange in the dialogue: how often the individuals alternate talking and listening, and how long each tends to talk while the other listens (called 'taking turns' talking, or alternating 'holding the floor'). This basic rhythm is also described by the durations of the silences which occur as the individuals switch roles from speaker to listener ('switching pause'), and by how often the two tend to interrupt each other by speaking at the same time ('simultaneous speech'). Finally, each person's rhythm of speech within his own floor (turn) is also described: the frequency and durations of the sounds ('speech') and silences ('pauses') within the individual's train of speech. The content or meaning conveyed in speech is entirely excluded as a criterion in determining these descriptive

classifications. For this reason, the classifications are said to be 'content-free', and the variables defined by the classifications are called the 'content-free' variables (see Feldstein and Welkowitz, in press).

According to Jaffe and Feldstein (1970) and Matarazzo and Wiens (1972), systematic research into temporal patterns of communication was initiated by two separate research groups. In 1938, Norwine and Murphy described typical patterns of dyadic telephone conversation utilizing oscillograph ink recordings of the participants' voices. A second group of researchers was lead by Eliot Chapple, who designed and manufactured an instrument called the 'Interaction Chronograph', to assist observers in recording both verbal and non-verbal communication between two individuals (Chapple, 1939). Whereas Norwine and Murphy's research was primarily descriptive, Chapple's was directed at relating rhythms of social exchange to man's biological rhythms (see Chapple, 1970) and to the personalities of the participants (see Chapple, 1940). Another of Chapple's interests was the use of the Interaction Chronograph to study the speech patterns of patients in psychiatric interviews and, beginning in the early 1950's, a number of research teams used versions of his instrument for this same purpose (see Matarazzo and Wiens, 1972).

Since this time, there has been a steady increase of interest shown in the measurement of temporal speech patterns. Efforts have been made to describe the individual subject's temporal patterns of speech and their relation to the subject's personality (reviewed in Matarazzo and Wiens, 1972; and Ramsey, 1968). Research has also been directed at measuring group (primarily dyadic) temporal patterns of communication, and the relations of these patterns to the development of interpersonal

relationships in the group (e.g., Bales, 1950; Feldstein and Welkowitz, in press; Willard and Strodbeck, 1972).

A fundamental issue regarding an individual's temporal patterns of speech in the dialogue and, concomitantly, the content-free measures of these patterns, is the degree to which this aspect of an individual's behavior may be said to be characteristic of the individual. Little relation has been found between these measures and traditional personality measures (see Ramsey, 1968; Matarazzo and Wiens, 1972; Martindale, 1971). Another way of assessing how characteristic of an individual are his or her speech patterns is to compare them, over time, with those of other individuals. This is called the 'stability', 'consistency', or 'reliability' of the temporal speech patterns over time. It is tested by correlating the content-free measures of the patterns taken from individuals on two or more occasions (Jaffe and Feldstein, 1970, Matarazzo and Wiens, 1972).

A related issue is the degree to which temporal patterns of speech are modified by different conversational conditions. This is assessed using mean comparison tests to compare differences in the content-free measures, averaged across a group (or groups) of subjects, between different conditions (Jaffe and Feldstein, 1970; Matarazzo and Wiens, 1972). The same subjects can be tested under the different conditions (repeated measures design) or different groups of subjects can be tested under the different conditions (independent groups).

Both the stability and means comparisons tests assess changes in speech patterns from one conversational occasion to the next. However, the stability (correlational) test assesses change in the individual's patterns in relation to change in the patterns of other speakers: is

the 'fast-talker' on one occasion (relative to other speakers) also the fast talker on another occasion? In other words, is talking fast a characteristic of that individual's speech style on both occasions? The comparison of means, on the other hand, assesses absolute changes in the content-free measures from one occasion to the next: do individuals as a rule--fast and slow talkers alike in the group studied--tend to change their patterns of speech in a systematic fashion?

The research evidence strongly indicates that an individual's rhythm of speech is stable across a number of conversational conditions. Early studies of dyadic communication in psychological interviews showed that, when the interviewer's patterns of speech remained constant (were experimentally standardized), the interviewee's speech patterns were stable from first to second halves of the interview (Tuason, Guze, McClure, and Bequelin, 1961), and across entire interviews separated by test-retest intervals as long as nine months (reviewed in Matarazzo and Wiens, 1972). Generally, variables measuring the interviewee's speech and silence durations are consistently significantly correlated ($r > .60$, $p < .001$), while those of simultaneous speech, although significantly correlated, prove to be less stable. These results have been corroborated, under less constrained interview situations (analogues), in a study reported by Jaffe and Feldstein (1970). In this study, the interviewer's speech patterns were not held constant. Interviewee's speech patterns were observed to be stable across interviews with the same interviewer and, in addition, across non-stressful and stressful (embarassing topics were introduced) interviews.

An individual's temporal patterns of speech have also been shown to be stable in situations other than the interview. Wiens, Manaugh,

and Matarazzo (1976) have shown that silence durations are stable within the same conversations between bilinguals (English-French or English-German) who switched languages during the conversation. Two studies reported by Jaffe and Feldstein (1970) investigated temporal speech patterns in dialogues between the same subjects who were given the task to discuss differences of opinion (first study) and, in the second study (also reported in Feldstein and Welkowitz, in press), to talk about anything that might better enable them to get to know one-another. All of the stability coefficients were significantly different from zero ($p < .05$; $df = 30$ or 22), indicating that speech patterns were stable for individuals across each of the following conditions: a) within the same conversation for each of the two tasks (first-half to second-half of the conversations); b) within the same conversation, in same-sex and different-sex dyads; c) within the same conversation, when visual and gestural communication was prevented by means of an opaque screen interposed between the subjects (first study); d) across entire conversations, in dyads composed of women (second study). However, in the second study, when the subjects changed speaking partners, temporal patterns of speech were found to be unstable. Only the coefficient for the durations of an individual's speaking time remained stable.

The results of the stability studies suggest that an individual's temporal patterns of speech in a dyad--the rhythm of the flow of an individual's speech in conversation with the same other person--show a remarkable degree of stability within the same conversation or from one conversation to the next. This suggests that these patterns are characteristic of an individual relative to other persons. That the notion of stability is relative, however, means that the stability or instability of speech patterns does not necessarily reflect absolute

changes in the content-free measures of these patterns. Only two of these studies (Jaffe and Feldstein, 1970) linked the notion of stability to the absolute values of the content-free measures, and whether these values are modified as a function of the situation.

The variation in absolute values of the content-free measures, averaged over the sample of subjects studied, is assessed using means comparisons tests. Jaffe and Feldstein (1970), for example, reported that the elimination of visual-gestural cues did not significantly affect the stability of the content-free variables within conversations (in the study described previously). However, means comparisons tests revealed that the loss of visual cues were associated with relatively shorter durations of pauses, switching pauses, and simultaneous speeches relative to when these cues could be used (Jaffe and Feldstein, 1970). These results indicated that, although patterns of speech remained stable for an individual relative to the group, the effect of the loss of visual-gestural cues was to cause the group, as a whole, to tend to use shorter durations of pauses, switching pauses, and simultaneous speech. Patterns of speech were shown to be stable, but sensitive to environmental manipulation.

Modifications in speech patterns occur as a result of a number of other factors. For example, it has been shown that these patterns are sensitive to variation in the medium of exchange (as in the loss of visual and gestural cues; reviewed in Williams, 1977), to the arousal level of the speaker (e.g., Kasl and Mahl, 1956; Siegman and Pope, 1972), to the influence of the partner's temporal speech patterns (reviewed in Natale, 1975), and to the interpersonal relationships developed by the participants (e.g., Craig, 1966; Matarazzo and Wiens, 1977; Pope and Siegman, 1972).

It is apparent from these studies that an individual's patterns of speech are sensitive to a number of factors. However, judging from the results of the stability studies, particularly those reported by Jaffe and Feldstein (1970), the modification is one of quantity, not of pattern. An individual that responds fast to the partner's speech, speaks for long intervals of time, and pauses for short intervals relative to other persons, will tend to do so--perhaps at a higher or lower speed--in conversations with the same partner at different times.

A comment by Jaffe and Feldstein (1970) suggests a cautionary note regarding the stability of an individual's patterns of speech in the dialogue. The authors, citing their own research, note that factors causing speech patterns to be stable in conversations with the same partner might not exist in more competitive dialogues than those studied. Should this be the case, it would constitute an important departure from the previous results. Systematic investigation of competitive and non-competitive dialogues might therefore add to our understanding of the dynamics underlying speech patterns. Except for the study reported by these authors, the stability of dyadic speech patterns has not been tested within conversations where individuals have been given a competitive task. Furthermore, no study has reported testing the stability of temporal speech patterns across a non-competitive and a competitive task.

Two studies report tangential evidence that non-competitive and competitive tasks are characterized by different patterns of speech. The first, a pilot study by Cardwell (cited in Mortenson, 1974) suggested that speech patterns in dyads given instructions to discuss

a difference of opinion cooperatively (low-conflict group) were characterized by few simultaneous speeches, longer speaking times, but overall less talking (because of longer silences) than were dyads given instructions to be competitive (high-conflict group). A study by Hargreaves (1960) obtained results that apparently were contradictory to those found in the Cardwell study. Hargreaves found that college roomates (males) produced a greater frequency of short-duration utterances (speeches less than 1.0-sec), when engaged in conversation while studying than in organized (by the experimenter) competitive discussions. No other results describing a subject's speech patterns were reported in this study. The apparent contradictions between the results from these two studies (longer speaking times in Cardwell's competitive discussion; shorter speaking times in Hargreaves' competitive discussion) might have been due to the differences between the second conversations used in each of the studies. Cardwell compared competitive and cooperative discussions; Hargreaves compared competitive discussions to casual, unorganized conversations. A second factor may have been that Cardwell studied the dialogue of persons who, presumably, had not met prior to the discussions, while Hargreaves examined the conversational behavior of dormitory roomates. Because of these factors, a conclusion regarding the temporal patterns of speech in non-competitive and competitive discussions cannot be reached from the two studies.

In summary, then, the research evidence indicates that temporal patterns of speech are relatively stable characteristics of an individual's speaking behavior in dyadic communication with the same partner. At the same time, it has been shown that these patterns are sensitive

to circumstances of conversation, and there is some evidence suggesting that the degree of competition in a task may be one such circumstance.

A major purpose of the present research, therefore, was to test the stability of an individual's temporal patterns of speech in dyadic conversation over successive non-competitive and competitive tasks. A second purpose was to examine how the nature of the task discussed might cause speech patterns to differ in the two conversations.

A third and chiefly exploratory purpose of the present research was to investigate how an individual's temporal patterns of speech, relative to that of the partner, might be related to the interpersonal relationship developed with the partner. A number of studies have indicated that an individual's speech patterns are sensitive to this relationship. In relation to a non-competitive task, most of these have been studies of the interview situation. It has been found, for example, that interviewees speak longer and respond faster to a warm interviewer as opposed to an interviewer who offers a cold presence (Pope and Siegman, 1972). Some half-dozen studies have found correlations between the interviewee's speech patterns and the level of empathy of the interviewer (reviewed in Matarazzo and Wiens, 1977). As was found in Siegman and Pope's study of interviewer warmth, one finding in this literature is that clients tend to speak longer to a more empathetic interviewer.

The literature concerning self-disclosure suggests what appears to be a similar relationship. These studies have revealed a positive correlation between the intimacy level of a disclosure and the length (in number of words or in time) of the disclosure (reviewed in Chaikin and Derlaga, 1974; Cozby, 1973; Altman and Taylor, 1973).

However, the disclosure studies have generally required subjects to respond to single statements, or a series of statements, of an experimenter (or another subject) rather than the investigation of relatively unstructured dialogue.

Concerning competitive discussions, the literature in group decision making has consistently found relations between content-free measures of an individual's participation in the group and process measures of the individual's leadership, influence, and the degree of influence attributed to the individual by other group members. It has been demonstrated that the person who talks the most is the most influential in determining decision outcomes in problem solving groups of two or more persons (Jaffee and Lucas, 1969; Riecken, 1958; Strodbeck, 1951) and is rated by other group members as the most influential person in the group (reviewed in Willard and Strodbeck, 1972). A study by Jaffee and Lucas (1969) suggested that the sheer quantity of talk was more important than either the quality of the talk or correctness of decision in determining the leadership status attributed to an individual by the other group members. This literature suggests that, rather than simply reflecting the interpersonal relationships developed by members of a group, the content-free patterns of an individual's speech might be a factor in determining the relationships.

Another content-free measure which has been implicated in interpersonal influence processes is simultaneous speech. According to Ferguson (1977), simultaneous speech (or 'interruptions') has traditionally been used as a measure of social dominance and conflict in family therapy research (e.g., Farina, 1960; Jacob, 1974). Ferguson, however, argued against this use. Her research has shown that simulta-

neous speech is used to facilitate turn-taking between speakers during a conversation, rather than to dominate the interactions.

In summary, it appears that an individual's temporal patterns of speech, in addition to possibly being modified by the competitive or non-competitive nature of the conversational task, can also be related to the nature of the interpersonal relationship developed between two speakers within a particular task conversation. In non-competitive conversations, it appears that warmth and empathy projected by one individual might cause the second to speak for longer durations, and that more intimate encounters might also be typified by longer intervals of speech. The temporal patterns of an individual's speech might also be a factor in determining the interpersonal relationship, and the individual's perceptions of that relationship, as indicated in the literature concerning influence. This literature suggests that the person who talks longest in a group tends to be the most influential member of the group.

Overview of the Study and Hypotheses

The present research was undertaken in order to investigate the individual's temporal patterns of speech in two successive dialogues, each concerning a different task. The two tasks chosen were similar to those described by Jaffe and Feldstein (1970) as having been investigated in separate experiments. In the present study, these were an acquaintance task, (subjects were asked to get to know one another) and a bargaining task (subjects were asked to discuss and resolve differences of opinion). The acquaintance task was considered non-competitive, while the bargaining task was designed to create a mild degree of competition between the subjects.

Three aspects of an individual's speech behavior were investigated in the present study. Based on previous research, it was possible to formulate hypotheses about each of these aspects.

First, the stability of an individual's speech patterns was tested within each of the conversations (acquaintance and bargaining) as well as across the two conversations. It was expected that speech patterns would be stable within each of the conversations. The results of the stability tests within the conversations also provided a baseline from which the stability across the conversations could be evaluated. It was anticipated that speech patterns would be relatively stable across the two conversations.

Second, the effect of the two conversation tasks on an individual's temporal patterns of speech was investigated. It was expected that an individual's speech patterns in the non-competitive acquaintance task would be characterized by a higher frequency of short-duration speeches (less than 1.0-sec) than the competitive bargaining task. Other content-free measures were also compared between the two tasks in order to further describe how the tasks affected temporal speech patterns, but no further hypotheses were advanced.

Third, the relation between an individual's patterns of speech and the interpersonal relationship established with the partner was investigated. It was expected that the more intimate individual in the acquaintance conversation would tend to hold the floor for longer durations of time (have longer speaking turns) than the less intimate individual. In the bargaining conversation, it was expected that the more influential individual, and the individual regarded as more influential by the participants, would hold the floor for longer

intervals than the less influential individual. Other aspects of an individual's speaking patterns were investigated in the study of these relationships, and this aspect of the investigation was regarded as exploratory.

Method

Overview

In a 2 x 2 counterbalanced design, independent variables were type of conversation (acquaintance or bargaining) and order of conversations. Female subjects were randomly paired, and two conversations from each of the pairs were recorded. The order of administration of conversations was counterbalanced by randomly assigning the pairs to one of two groups. One group completed the acquaintance conversation first, followed by the bargaining conversation (Acquaintance First group). The order of conversations was reversed for the second group (Bargaining First group). Dependent variables were content-free measures of dyadic speech, and measures of intimacy and influence in the acquaintance and bargaining conversations, respectively.

Subjects

Subjects were 60 females whose names were contained on the Registrar's list of students at the University of Ottawa. One-half were recruited by telephone, the other half were recruited through appeals for subjects made by the experimenter in Introductory Psychology classes. The latter group received a small amount of course credit for participation in the experiment and attendance at a follow-up debriefing-discussion meeting. In all cases, final arrangements and reminders of scheduled session times were completed over the telephone. Subjects were randomly assigned to pairs, and pairs were randomly assigned to the Acquaintance First or Bargaining First groups. Ages ranged from 17 to 39-years, with a mean of 24.2 (*SD* = 5.2). Each subject declared that her mother tongue and

principal language of discourse was English. Most of the subjects (75%) reported that the mother tongues of both of their parents were English. Subjects within a pair had not met each other prior to the experimental session.

Apparatus

Conversations were recorded using pressure-sensitive throat microphones connected to a Sony cassette tape-recorder. Temporal speech patterns were recorded via a second circuit which lead from the microphone to a DEC PDP-11 computer. The PDP-11, sampling the dialogues at fixed intervals, converted the analog voice signals to digital punched paper-tape recordings of the temporal sound-silence patterns of each subject in the dyad. An IBM-360/65 computer was programmed to analyze these paper-tape recordings. This analysis included modifying the original records by converting sound (or silence) states of specified durations to silence (or sound), and the output of the summary statistics of the content-free variables. A description of the speech recording and analysis system is given in Appendix A.

Materials

As part of a larger study, subjects were administered several questionnaires in the course of the experimental session. Only those items directly relevant to the present study will be described here. One questionnaire asked subjects for biographical information (Appendix C-1, Items 4, 5 and 6). A second questionnaire contained items which asked each subject to list the five most intimate topics discussed by her in the acquaintance conversation, and the five most intimate topics discussed by her partner. She was asked to rate each of these 10 topics on a scale from 1 to 8,

according to how intimately she perceived the topic to have been discussed by her or her partner (Appendix C-3, Items 6 and 7). In a third questionnaire, subjects were asked to rate, again on 8-point scales, their own and their partner's level of influence in reaching the decisions required by the bargaining conversation task (Appendix C-4, Items 4 and 6).

Finally, an opinion scale (Appendix C-5) was used to assess subjects' political opinions concerning the relative importance of 15 professions (or life-styles) in representing Canadian life and traditions. Subjects were required to rank the professions by order of importance. This scale was developed from a previous study. The 15 professions chosen for the scale were those that, in the previous study, displayed the greatest variability of ranking by the subjects. The responses to this scale, and the responses to the questions concerning perceived intimacy and influence, were used to develop the dependent measures of intimacy and influence resulting from the conversations.

Dependent Variables

Content-free variables: Analysis of the sound-silence records of the dyadic conversations produced the following content-free variables. The variables are defined for Person A relative to the speaking partner, Person B.

1. Speaker switch: A speaker switch occurs as the silence interval preceded by B talking alone and followed by A talking alone (a switching pause), or as A beginning to talk alone just as B becomes silent. The speaker switch is tallied as the frequency of floors.

2. Floor: The interval of time between speaker switches,

excluding the switching pause. A floor must begin as A begins speaking alone and end at a speaker switch (followed by B speaking alone).

3. Speech: Sound from A, B is silent.

4. Pause: Silence during A's floor time (necessarily preceded and followed by sound from A).

5. Non-interruptive simultaneous speech: During B's floor time, A speaks while B is speaking, and stops speaking as B continues to speak. B thus retains the floor.

6. Interruptive simultaneous speech: During B's floor time, A speaks while B is speaking and continues to speak as B becomes silent. The floor thus switches from Person B to Person A.

Measures of intimacy and influence: Both objective and subjective ratings of intimacy and influence were taken. To develop objective intimacy ratings, the experimenter and a second judge, a female who was not cognizant of the research manipulations, listened to tape-recordings of entire acquaintance conversations. Each subject was given an intimacy rating from 1 (not at all intimate) to 8 (very intimate) for each of the first and second halves of the conversation. Spearman rank order correlation coefficients were computed testing the interjudge reliability of each of these ratings. The coefficient for the ratings given for the first-half of the conversations was .71 ($df = 49$, $p < .001$), and for the second-half of the conversations was .75 ($df = 49$, $p < .001$). The procedure used to derive these ratings is described in Appendix B-1. Subjective ratings of intimacy were the means of the five topic ratings given by subjects for the two questionnaire items concerning subjects' perceptions of their own and their partners' intimacy.

Objective influence scores were developed by measuring the concordance between a subject's pre-conversation rank ordering of the 15 professions in the opinion scale, and the rank ordering of these same professions arrived at by the dyad during the bargaining discussion. The formula used to compute the influence scores from the two rank orders is explained in Appendix B-2. Subjective ratings of influence, one a self-rating and the second a rating of the partner, were taken from the two questionnaire items concerning perceived influence.

Procedure

After agreeing to participate in the research (over the telephone or in the classroom), subjects were re-contacted to finalize appointment times. Subjects were told only that the study concerned communication in dyads. All answers to subjects' questions were referred to a follow-up debriefing session held two weeks after the study was completed.

Each dyad was seen separately. The first subject to arrive was asked to await her partner in the experimental room or in an adjacent similar room. The second subject to arrive was conducted to a free room, and both subjects were then administered the biographical questionnaire (see Appendix C-1). If the dyad was a member of the Bargaining First group, an opinion scale (Appendix C-5) was given to each of them to complete after both had finished the first questionnaire.

After both subjects had completed these questionnaires, the subject in the second room was escorted into the experimental room by the experimenter and introduced to her partner. The subject was seated across from her partner at a square table measuring 1.5 meters along

the edge. Entrance first into the experimental room and seating arrangements (one chair faced the door of the room, the second faced away from the door toward a curtained window) were counterbalanced to control for possible territoriality effects. Subjects were asked to put on the throat microphones, which were attached by means of velcro collars passed around the neck.

Initial instructions were given concerning use of the microphones and adjustment of the equipment (see Appendix D-1). Each subject was asked to read a short paragraph so that the experimenter, who left the room, could ensure that the voices were being recorded properly. In the course of adjusting the equipment, subjects were told that the conversation was being tape-recorded for future analysis, and that the conversation was being monitored by the experimenter. All conversations, subjects were told, would be kept confidential within the confines of those working on the experiment. No mention was made of the PDP-11 recording or the content-free analysis of speech that was to be done. Because the microphones responded to vibration of the surface of the skin, initial instructions were concluded by the experimenter asking subjects not to smoke or move around in the chairs excessively, and not to adjust the microphones in the course of the conversation.

Instructions for the first conversation--acquaintance or bargaining--were then presented (see Appendices D-2 and D-3). For the acquaintance conversation, subjects were asked to "try and get to know each other as well as you can in 25 minutes." Instructions for the bargaining discussion were that subjects should repeat the same task as a group that had just been completed individually (the rank ordering

of professions). Subjects were instructed to "defend your initial decisions to each other; try to convince your partner of your point of view. But remember that you must reach final group decisions regarding the importance of each profession..." A stack of 15 index cards (each with one of the professions marked on it), was left in the middle of the table. Subjects were asked to order the cards according to the decisions reached. After the instructions were completed and the subjects' questions concerning the conversation were answered, the experimenter left the room (closing the door), and instructed the subjects to begin the conversation over the intercom as the recording devices were started.

The acquaintance conversation was limited to 25 minutes by the experimenter entering the room to terminate the conversation. The bargaining conversation was not limited, but a time limit of 30 to 45 minutes was suggested. Subjects signalled completion of this conversation to the experimenter over an intercom system. For dyads that had not completed the conversation in 40 minutes, the experimenter turned off the content-free recording of the conversation, entered the experimental room, told the subjects that 40 minutes had elapsed, and asked the subjects to "try and finish up in the next 5 to 10 minutes." The recording was immediately re-started after this break of less than 30 seconds. This process was repeated at 50 and 60 minutes for two dyads that extended beyond 45 minutes. The 25 minute time limit for the acquaintance conversation was used after it was found that six pilot groups, given the same instructions for the bargaining conversation, actually averaged approximately 25 minutes to complete the bargaining task. It was hoped that the average length of the

bargaining conversations would approximate the 25 minutes given the acquaintance conversation.

After the first conversation ended, subjects removed the microphones. The subject who had originally been in the second room was asked to return to that room, and both subjects were asked to fill out questionnaires regarding their perceptions of the levels of intimacy (acquaintance conversation) or influence (bargaining conversation) reached in the conversation (Appendices C-3 or C-4). If the dyad was a member of the Acquaintance First group, the subjects were given the opinion scale (Appendix C-5) to complete after finishing the first questionnaires.

The subject who had left the experimental room was escorted back after both subjects had completed all questionnaires. Reminders about use of the microphones were given by the experimenter as the subjects put the microphones on (Appendix D-1); speech and silence thresholds were established as in the first conversation; and the instructions for the second conversation were given by the experimenter (Appendix D-2 or D-3). After the conversation ended, the two subjects were separated into the two rooms as before. Each was given the questionnaire regarding her perceptions of the conversation (Appendix C-3 or C-4). General questions about the nature of the experiment were answered, and the session was ended.

Results

Overview

The present research was undertaken in order to investigate three sets of hypotheses, and, accordingly, three sets of analyses were completed. First, in order to test the stability of speech patterns, product-moment correlation coefficients were computed for each of the content-free variables within conversations and then between the acquaintance and bargaining conversations. After determining which of the variables were stable across the different conversational tasks, a second set of analyses was completed in order to determine which of the variables differed significantly across the two conversations. The purpose of this set of analyses, which utilized repeated measures analyses of variance to compare content-free measures across the tasks, was to determine how the different conversational tasks affected patterns of speech. Finally, a third set of hypotheses concerned the manner in which patterns of speech influenced the development of interpersonal relationships established in the acquaintance and bargaining conversations. Factor analytic investigations of the relationships between intimacy, influence, and the content-free measures were completed in this set of analyses.

It is possible to calculate frequency, duration and mean duration measures for each of the content-free variables within a particular conversation or segment of a conversation. All previous research concerning the stability of the content-free variables have studied only the frequency and/or mean duration measures (see Jaffe and Feldstein, 1970; Matarazzo and Wiens, 1972). For this reason, and

because the three measures are mathematically totally interdependent, only frequency and mean duration measures were studied in the first two sets of analyses of the present research (the correlation and variance analyses). In the third set of analyses (the factor analyses), only mean durations of the content-free variables were considered.

It was necessary to transform the frequency measures in order to compare values obtained for subjects who participated in conversations varying in length. The transformation consisted of dividing the raw frequency by the total length (in seconds) of the conversation in which it was measured. This adjusted for the different lengths of the conversations, giving the frequency of a variable per second. This value was then multiplied by a constant. The constant was the average length of all 52 conversations (1,673-sec), chosen because it best represented the total time of any given conversation (the raw frequency of a content-free variable is the frequency of the variable per total conversation time). Thus, the transformed measure expressed the frequency of a content-free variable in a particular conversation as a frequency per standard time unit, or the average length of all conversations (1,673-sec, or 27.9-minutes).

A total of 30 dyads participated in the research. However, data from four dyads were lost due to equipment failure, leaving 14 dyads in the Acquaintance First group and 12 dyads in the Bargaining First group. The cassette tape-recording from one subject in a remaining Acquaintance First dyad was incomprehensible. Data from this subject were used in all analyses except those involving the objective intimacy measures.

Stability of the Content-Free Variables

Previous research has indicated that an individual's speech patterns tend to be stable both within conversations and across conversations concerning the same task. A goal of the present research was to test the stability of these patterns across successive non-competitive and competitive task conversations. Stability was tested first within each of the conversations, and then across the two conversations. The former test provided a baseline from which the stability of the speech patterns across the conversations could be evaluated.

Content-free measures of speech from the two subjects within a dyad are not independent. Because of this, stability tests for each variable (within and between conversations) were conducted on a random sample of 26 subjects, one from each dyad, and then cross validated on a sample consisting of the 26 partners. In order to be judged stable, it was required that the variable be significantly positively correlated ($p < .01$) in both samples.

To test the stability within conversations, correlations of each of the content-free variables were computed between the first and second 12-minute segments of the acquaintance conversations and then the bargaining conversations. Four bargaining conversations were substantially shorter than 24-minutes (less than 18-minutes, with the second segment less than 6-minutes) and were dropped from these analyses to insure that the duration of time segments were comparable. The remaining conversations were all longer than 22-minutes.

The frequency of floors is, by definition, the same for both subjects (in a dialogue, floors alternate between the two individuals). Thus, this variable is a dyadic rather than individual variable, the measure for one subject representing the measure for the dyad. Therefore,

the frequency of floors was correlated in one sample only, and cross validation of a significant correlation was not required to conclude that the variable was stable in the test being conducted.

The correlation coefficients for the frequency and mean duration of each of the content-free variables, calculated for each of the two samples within each of the two conversations, are presented in Table 1. In the acquaintance conversation, most of the variables proved to be significantly correlated in both samples (and, thus, considered stable). Fewer were stable in the bargaining conversation, and discrepancies between the stability of the variables within the two different conversations will be noted. The frequency of switching pauses, stable in the bargaining conversation, is shown to be unstable in the acquaintance conversation. The reverse is true for the mean duration of switching pauses (stable in the acquaintance conversation, unstable in the bargaining). A second difference between the conversations concerns the simultaneous speech variables. Frequencies of non-interruptive and interruptive simultaneous speeches (NSS and ISS), and the mean duration of NSS were stable in the acquaintance conversation; only the frequency of NSS proved to be stable in the bargaining conversation. Finally, although the mean duration of floors is shown to have been stable in the acquaintance conversation and unstable in the bargaining conversation (Table 1), the correlation of .47 found for the second sample in the bargaining conversation is significant at a borderline level ($p < .04$). Thus, the stability of the mean duration of floors was not considered to differ between the two conversations.

The different stabilities found for the content-free variables in

Table 1

Correlations of the Content-Free Variables within Conversations (between First and Second 12-Minute Segments)

Variable	Acquaintance[a]		Bargaining[b]	
	Sample 1	Sample 2	Sample 1	Sample 2
Frequencies				
Floor	c	.48*	c	.55*
Speech	.36	.60**	.47	.41
Pause	.54*	.50*	.54*	.49*
Switching Pause	.31	.38	.71**	.50*
NSS[d]	.78**	.67**	.84**	.52*
ISS[e]	.54*	.61**	.30	.63**
Mean Durations				
Floor	.67**	.52*	.50*	.47
Speech	.60**	.55*	.77**	.73**
Pause	.78**	.68**	.78**	.64**
Switching Pause	.48*	.57*	.34	.45
NSS[d]	.54*	.64**	.27	.40
ISS[e]	.14	.20	.30	.12

[a] $\underline{n} = 26$.

[b] $\underline{n} = 22$.

[c] Floor frequencies are the same for both subjects within a dyad.

[d] Non-interruptive simultaneous speech.

[e] Interruptive simultaneous speech.

*$\underline{p} < .01$, $\underline{df} = 24$ (Acquaintance) or 20 (Bargaining) (One-tailed).

**$\underline{p} < .001$, $\underline{df} = 24$ (Acquaintance) or 20 (Bargaining) (One-tailed).

the two conversations were unexpected. A second analysis involving the first and second 12-minute segments was completed to attempt to explain these results. Speech patterns in dialogues between the same persons might follow a similar process of development within two different task conversations. Patterns observed in the initial segment of the acquaintance conversation would then tend to be similar to those measured in the initial segment of the bargaining conversation. If this were the case, the content-free variables would be positively correlated across initial segments of the two different conversations instead of (or as well as) being correlated within conversations. Similarly, speech patterns in the second 12-minute segments of the two conversations would tend to be related.

To investigate this hypothesis, the content-free measures from the first and second 12-minute segments of the acquaintance conversation were correlated with the measures from the corresponding segments of the bargaining conversation. Again, the correlations were calculated in the same sample of 26 dyad members, and cross-validated on their partners. The results are presented in Table 2. Only the frequency of floors across first segments is shown in this table to have been stable. Thus, the frequency with which floors alternated between individuals was found to be stable within conversations (Table 1) and across initial segments of both conversations. However, none of the other variables proved to be stable across either the first or second 12-minute segments of the conversations. The hypothesis that speech patterns might be similar in corresponding 12-minute segments of the different task conversations was not supported. The differential stability of the variables within the two conversations is not

Table 2

Correlations of the Content-Free Variables across Conversations (between First and Second 12-Minute Segments)

Variable	First Segment[a]		Second Segment[b]	
	Sample 1	Sample 2	Sample 1	Sample 2
Frequencies				
Floor	c	.52*	c	.17
Speech	.19	.31	-.11	.41
Pause	.22	.18	.22	.29
Switching Pause	.19	.20	.27	.36
NSS[d]	.70**	.34	.57*	-.11
ISS[e]	.28	.50*	.26	.03
Mean Durations				
Floor	.15	.46*	.31	.20
Speech	.55*	.35	.36	.34
Pause	.38	.21	.65**	.12
Switching Pause	.26	.22	.12	.33
NSS[d]	.28	.05	.07	.38
ISS[e]	.43	.15	.22	.24

[a] $n = 26$.

[b] $n = 22$.

[c] Floor frequencies are the same for both subjects within a dyad.

[d] Non-interruptive simultaneous speech.

[e] Interruptive simultaneous speech.

*$p < .01$, $df = 24$ (First Segment) or 20 (Second Segment) (One-tailed).

**$p < .001$, $df = 24$ (First Segment) or 20 (Second Segment) (One-tailed).

explained by this hypothesis.

The results of the within conversation stability investigations shown in Table 1 indicate that floor, speech (mean duration) and pause measures were stable in both conversations. The results for the switching pause and simultaneous speech measures varied between the conversations, with more of the measures found to be stable in the acquaintance conversation. In contrast to these results, Table 3 shows that none of the variables (measured across the entire length of conversations) proved to be stable across the acquaintance and bargaining conversations. Although some of the variables are seen to be significantly correlated in one of the samples (Table 3), none is significantly correlated in both samples.

Effects of Conversation Tasks on Speech Patterns

The correlation analyses indicated that an individual does not maintain the same patterns of speech across two successive conversations concerning different tasks. A second set of analyses was completed in order to describe in detail how speech patterns differ between the different task conversations. In this investigation, repeated measures analyses of variance were used to test the significance of the difference of each of the content-free variables between the acquaintance and bargaining conversation tasks.

The design used for the analyses varied according to the hypotheses or the content-free variable (the dependent measure) studied in a specific analysis. However, all of the analyses included as factors the order of conversation presentation (acquaintance first vs bargaining first) and the task discussed (acquaintance vs bargaining). In order to produce exact least square solutions to the analyses, two randomly selected dyads from the Acquaintance First group were excluded from all

Table 3

Correlations of the Content-Free Variables across Conversations

(Variable Calculated from Entire Conversation)

Variable	Sample 1	Sample 2
	Frequencies	
Floor	a	.31
Speech	.18	.59**
Pause	.38	.49*
Switching Pause	.26	.25
NSS[b]	.76**	.24
ISS[c]	.35	.40
	Mean Durations	
Floor	.30	.44
Speech	.53*	.38
Pause	.53*	.15
Switching Pause	.29	.35
NSS[b]	.35	.37
ISS[c]	.40	.65**

Note: $n = 26$.

[a]Floor frequencies are the same for both subjects within a dyad.

[b]Non-interruptive simultaneous speech.

[c]Interruptive simultaneous speech.

*$p < .01$, $df = 24$ (One-tailed).

**$p < .001$, $df = 24$ (One-tailed).

of the analyses, leaving an equal number of dyads in the Acquaintance First and Bargaining First groups (12 dyads in each). In all of the analyses except that of the frequency of floors, the individual subject was the unit of analysis. Because the frequency of floors is a dyadic variable (the same frequency for both subjects), one subject's score was used to represent the dyad, and the dyad thus became the unit of the analysis.

Frequency measures. The analysis of variance of the frequency of floors utilized a 2 x 2 repeated measures design with Order of Presentation (acquaintance first vs bargaining first) and Task (acquaintance vs bargaining) as factors. Measures were repeated across dyads. The results of this analysis are presented in Table 4. It will be noted in this table that only the Task effect is significant. Frequency of floors in the acquaintance conversation ($\overline{X}$ = 188.5 floors per conversation) was significantly higher than in the bargaining conversation ($\overline{X}$ = 171.4).

The remaining analyses of variance used individual subjects as the basic unit of analysis. To deal with the interdependence of the content-free variables between subjects within dyads, the subjects' membership in a dyad was included as a separate factor. Thus, in addition to the Order of Presentation and Task Factors, the remaining analyses included a third factor, Dyad (subjects' dyadic memberships) as a random factor nested within Order of Presentation.

A fourth factor was included in the analyses of variance of speech and pause frequencies. It was hypothesized that the frequency of short-duration speeches (less than 1-sec) would be higher in the acquaintance conversation than in the bargaining conversation. To test

Table 4

Analysis of Variance of Frequency of Floor

Source	df	Mean Square	F Ratio
Between Cells (Dyads)	23		
Order of Presentation (O)	1	938	.79
Dyad (D)	22	1,193	
Within Cells (Dyads)	24		
Task (T)	1	3,503	5.56*
T x O	1	398	.63
T x D	22	630	

*$p < .05$.

this, the significance of the differences in speech frequencies between conversations was assessed at three duration intervals: the frequency of speeches of duration less than 386-msec, of duration greater than or equal to 386-msec but less than 965-msec (approximately 1-sec), and of duration greater than or equal to 965-msec. Because of the interrelationship of the speech and pause variables as measures of sound and silence within an individual's floor time, the frequency of pauses was also tested at the same three duration intervals. Frequencies within duration intervals were derived using a speech analysis procedure called "filtering" (see Appendix A). The inclusion of this last factor resulted in a 2 x 12 x 2 x 3 repeated measures analysis of variance. The factors were Order of Presentation (acquaintance first vs bargaining first), Dyad (subjects' membership in a specific dyad), Task (acquaintance vs bargaining) and Duration Interval (less than 386-msec, greater than or equal to 386-msec but less than 965-msec, and greater than or equal to 965-msec).

The results of the analysis of variance of the frequency of speeches are presented in Table 5. In examining this table, significant main effects for the Task and Duration Interval factors will be noted, as well as a significant Duration Interval by Task interaction (DI x T). None of the other main effects or interactions is significant. The significant task effect signifies that individuals tended to speak more often in the acquaintance conversation ($\bar{X}$ = 210.4) than in the bargaining conversation ($\bar{X}$ = 189.5). The Duration Interval effect indicates that the frequency of speeches tended to be greater in the duration interval between 386-msec and 965-msec ($\bar{X}$ = 233.2) than in either the interval less than 386-msec ($\bar{X}$ = 180.8) or the interval greater than 965-msec ($\bar{X}$ = 195.8).

Table 5

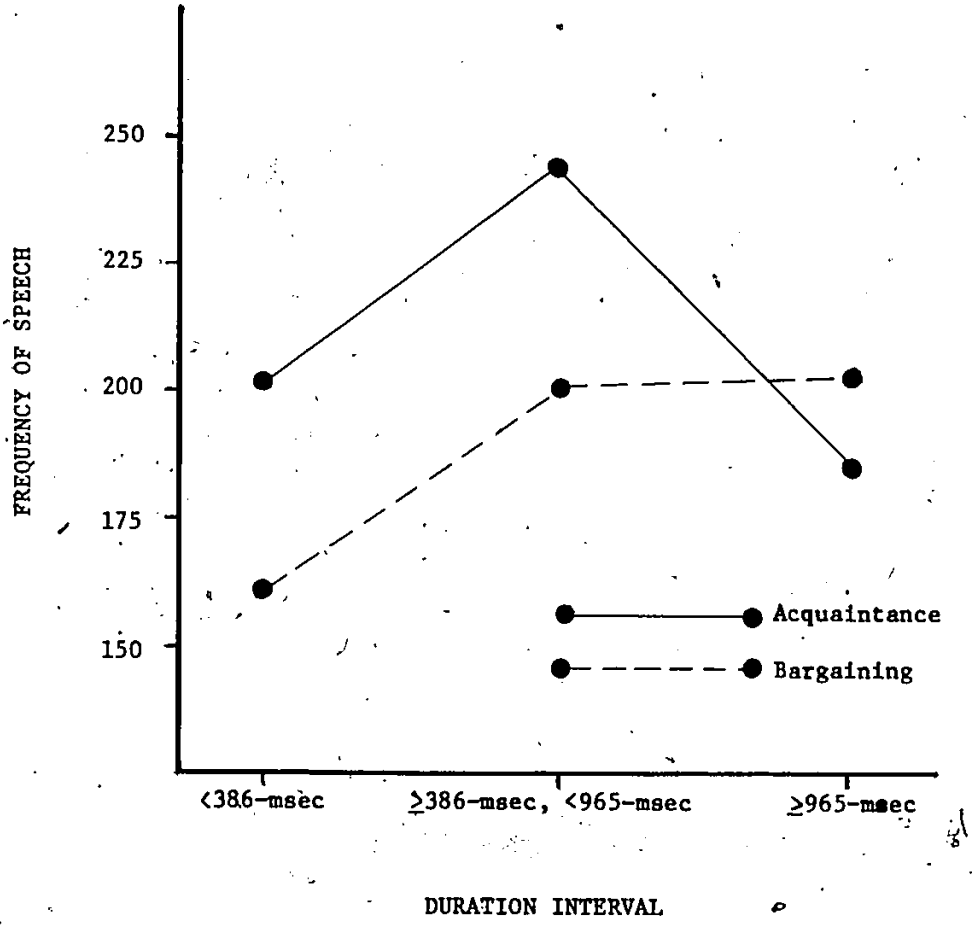
Analysis of Variance of Frequency of Speech

Source	df	Mean Square	Denominator of F Ratio	F Ratio
Between Subjects	47			
Order of Presentation (O)	1	1,117	(D)	.53
Dyad (D)	22	2,112	(S)	.15
Subjects (S)	24	13,723		
Within Subjects	240			
Task (T)	1	31,343	(T x D)	28.58*
T x O	1	4,592	(T x D)	4.19
T x D	22	1,097	(T x S)	.20
T x S	24	5,601		
Duration Interval (DI)	2	44,358	(DI x D)	20.42*
DI x O	2	1,535	(DI x D)	.71
DI x D	44	2,173	(DI x S)	1.20
DI x S	48	1,808		
DI x T	2	34,393	(DI x T x D)	41.21*
DI x T x O	2	1,534	(DI x T x D)	1.84
DI x T x D	44	835	(DI x T x S)	1.57
DI x T x S	48	531		

*$p < .001$.

Figure 1

Frequency of Speech as a Function of Duration Interval and Task



The main effects of Table 5 are qualified, however, by a significant Duration Interval by Task interaction (DI x T). The relev nt means are depicted in Figure 1. As can be seen, the significant interaction is caused by the frequ ency of speeches being greater in the acquaintance than in the bargaining conversation at the first two levels of the Duration Interval factor, with the relationship reversed at the third level. Significance tests of the simple main effects show that the frequency of short-duration speeches (both less than 386-msec and less than 965-msec in duration) was significantly greater (F = 11.3 and 12.4, respectively, df = 1,66, $p < .01$) in the acquaintance conversation relative to the bargaining conversation. The frequency of longer duration speeches (greater than or equal to 965-msec) did not differ significantly between the conversations (F = 3.49, df = 1,66).

As in the analysis of variance of speech frequencies, the analysis of variance of the frequency of pauses was a 2 x 12 x 2 x 3 repeated measures design using as factors Order of Presentation, Dyad, Task, and Duration Interval. The results of this analysis are shown in Table 6. The significant Task effect in Table 6 indicates that the number of pauses was significantly greater in the acquaintance conversation ($\bar{X}$ = 122.9) than in the bargaining conversation ($\bar{X}$ = 107.3). The frequency of pauses varied between duration intervals, as is evidenced by the significant Duration Interval main effect, tending to be higher in the duration interval from 386-msec to less than 965-msec ($\bar{X}$ = 138.5) than at durations greater than or equal to 965-msec ($\bar{X}$ = 121.1) or lower than 386-msec ($\bar{X}$ = 85.7).

This last main effect is qualified by the significant Duration Interval by Order of Presentation interaction (DI x O in Table 6).

Table 6

Analysis of Variance of Frequency of Pause

Source	df	Mean Square	Denominator of F Ratio	F Ratio
Between Subjects	47			
Order of Presentation (O)	1	961	(D)	.36
Dyad (D)	22	2,647	(S)	.22
Subjects (S)	24	11,940		
Within Subjects	240			
Task (T)	1	17,677	(T x D)	13.95**
T x O	1	4,527	(T x D)	3.57
T x D	22	1,267	(T x S)	.27
T x S	24	4,620		
Duration Interval (DI)	2	69,392	(DI x D)	67.82***
DI x O	2	4,373	(DI x D)	4.27*
DI x D	44	1,023	(DI x S)	.54
DI x S	48	1,910		
DI x T	2	1,397	(DI x T x D)	1.98
DI x T x O	2	360	(DI x T x D)	.51
DI x T x D	44	706	(DI x T x S)	.48
DI x T x S	48	1,474		

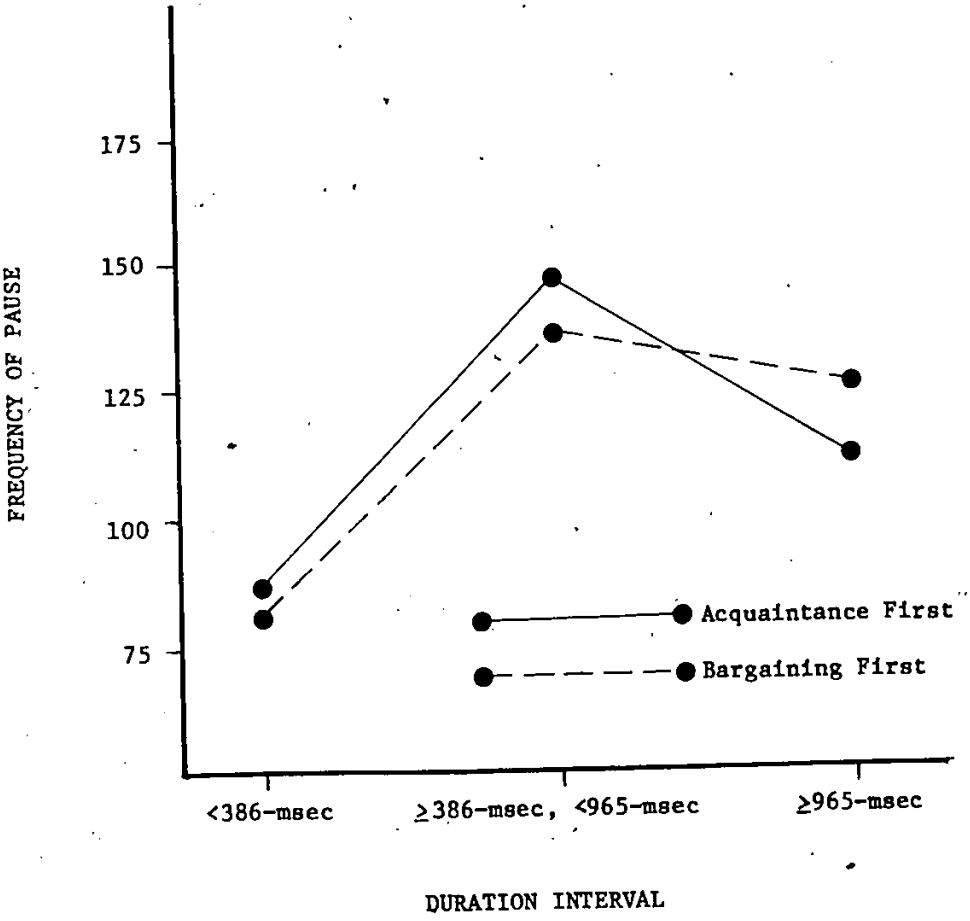
*$p < .05$.

**$p < .01$.

***$p < .001$.

Figure 2

Frequency of Pause as a Function
of Duration Interval and Order of Presentation



This interaction is plotted in Figure 2. Inspection of the figure suggests that the frequency of short-duration pauses in the lower two duration intervals was greater in the Acquaintance First group than in the Bargaining First group, but that the direction of the difference was reversed at the third duration interval. Tests of the simple main effects of Order of Presentation at each duration interval fail to confirm the visual analysis. None of the simple main effects is significant: F (1,66) = .55 at the first duration interval, F (1,66) = .45 at the second interval, and F (1,66) = .55 at the third interval. However, the data indicate a significant difference in the number of pauses between the first and third duration intervals for the Bargaining First group (F = 13.11, df = 1,44, $p < .01$). The difference in the number of pauses between the same duration intervals for the Acquaintance First group is not significant (F = 3.22, df = 1,44), causing the interaction shown in Table 6. The frequency of pauses is significantly higher in the second duration interval than in the first duration interval for both the Bargaining First and Acquaintance First groups (F = 16.65 and 16.02, respectively, df = 1,44, $p < .01$). Pause frequencies did not differ significantly between the second and third duration intervals in either group: F (1,44) = 4.88 and .46 (Bargaining First and Acquaintance First, respectively).

As no hypotheses were advanced concerning the relationships of the frequencies of the remaining content-free measures within specific duration intervals and between the tasks, the Duration Interval factor was not included in these analyses. Similarly, no hypotheses were advanced regarding this factor and the mean durations of the content-free variables. Thus, the design utilized in the remaining analyses

was 2 x 12 x 2, using as factors Order of Presentation (Acquaintance First vs Bargaining First), Dyad (subjects' dyadic memberships), and Task (acquaintance vs bargaining). Again, subjects were nested within dyads, and Dyad was nested as a random factor within the Order of Presentation factor; measures were repeated across the Task factor.

The results of the analysis of variance of the frequency of switching pauses is presented in Table 7. In this table, it will be seen that there are significant Dyad and Task effects, and a significant Task by Dyad interaction (T x D). The Dyad effect indicates a higher degree of variability of switching pause frequencies between the dyads than between the pairs of subjects within the dyads. The Task effect is due to the fact that the frequency of switching pauses was significantly higher in the acquaintance conversation ($\overline{X}$ = 111.4) than in the bargaining conversation ($\overline{X}$ = 100.8).

The Task by Dyad interaction (T x D in Table 7) qualifies the main effects. Table 8 presents task means for each of the 12 dyads in the Acquaintance First and Bargaining First groups as well as the differences between these means. It is seen in this table that the interaction is caused by the relationships between the differences shown for the dyads. One dyad shows a significantly higher frequency of switching pauses in the bargaining relative to the acquaintance conversation, while two dyads evidence significantly higher frequencies of switching pauses in the acquaintance conversation. Although the significant Task effect shown in Table 7 indicates that the frequency of switching pauses was higher in the acquaintance relative to the bargaining conversation, the data in Table 8 show that this effect is significant in an inconsequential number of the dyads (two of the 24).

The analyses of variance of the frequencies of non-interruptive and interruptive simultaneous speech are presented in Table 9. As can

Table 7

Analysis of Variance of Frequency of Switching Pause

Source	df	Mean Square	Denominator of F Ratio	F Ratio
Between Subjects	47			
Order of Presentation (O)	1	2,729	(D)	2.49
Dyad (D)	22	1,097	(S)	9.35**
Subjects (S)	24	117		
Within Subjects	48			
Task (T)	1	2,705	(T x D)	4.37*
T x O	1	745	(T x D)	1.20
T x D	22	619	(T x S)	4.38**
T x S	24	141		

*$p < .05$.

**$p < .01$.

Table 8

Frequency of Switching Pause as a Function of Task and Dyad

Dyads within Acquaintance First Group			Dyads within Bargaining First Group		
Acquaintance	Bargaining	Difference	Acquaintance	Bargaining	Difference
104	122	-18	93	65	28
124	91	33	124	103	21
118	114	4	111	59	52**
115	91	24	141	127	14
144	126	18	131	103	28
102	105	-3	146	95	51**
113	103	10	92	57	35
105	95	10	69	70	-1
134	98	36	96	81	15
106	122	-16	116	110	6
130	119	11	94	122	-28
72	120	-48*	93	121	-28
Mean					
114	109	5	109	93	16

*$p < .05$, $df = 1,46$.

**$p < .01$, $df = 1,46$.

Table 9

Analyses of Variance of Frequencies of Simultaneous Speech

Source	df	Mean Square	Denominator of F Ratio	F Ratio
Non-Interruptive Simultaneous Speech				
Between Subjects	47			
Order of Presentation (O)	1	1,735	(D)	.80
Dyad (D)	22	2,184	(S)	.51
Subjects (S)	24	4,273		
Within Subjects	48			
Task (T)	1	43	(T x D)	.03
T x O	1	784	(T x D)	.52
T x D	22	1,501	(T x S)	2.11*
T x S	24	711		
Interruptive Simultaneous Speech				
Between Subjects	47			
Order of Presentation (O)	1	309	(D)	.40
Dyad (D)	22	775	(S)	5.20**
Subjects (S)	24	149		
Within Subjects	48			
Task (T)	1	98	(T x D)	.27
T x O	1	32	(T x D)	.09
T x D	22	354	(T x S)	3.73**
T x S	24	95		

*$p < .05$.

**$p < .01$.

Table 10

Frequency of Non-Interruptive Simultaneous Speech as a Function of Task and Dyad

Dyads within Acquaintance First Group			Dyads within Bargaining First Group		
Acquaintance	Bargaining	Difference	Acquaintance	Bargaining	Difference
76	60	16	91	75	16
84	78	6	128	36	92*
112	107	5	67	80	-13
60	69	-9	87	110	-23
36	40	-4	52	111	-59
124	87	37	55	64	-9
51	42	9	109	133	-24
66	120	-54	83	158	-75*
67	119	-52	84	91	-7
132	60	72*	74	64	10
80	55	25	87	60	27
39	37	2	41	62	-21
		Mean			
77	73	4	80	87	-7

*$p < .05$, $df = 1,46$.

be seen in the top half of this table, only the Task by Dyad interaction is significant for the analysis of non-interruptive simultaneous speech. Table 10 presents the mean frequencies of this variable for the 12 dyads at the two levels of the Task factor. Three of the differences are significant: two dyads show higher frequencies in the acquaintance relative to the bargaining conversation, and one dyad a higher frequency of non-interruptive simultaneous speeches in the bargaining conversation. The Task by Dyad interaction shown in Table 9 is caused by this variability in differences across tasks among the dyads. Over all of the dyads, however, Table 9 indicates that the frequency of non-interruptive simultaneous speeches did not differ significantly across the acquaintance and bargaining tasks.

The analysis for the frequency of interruptive simultaneous speech is presented in the bottom half of Table 9. The significant Dyad effect in this table represents a high degree of variability between the dyads on this variable. The Task by Dyad interaction is also significant in this analysis, and is presented in Table 11. The table shows that the interaction is caused by the significantly higher frequency of interruptive simultaneous speeches in the acquaintance relative to the bargaining conversation for one dyad while, in the remaining dyads, no significant differences are noted across the two tasks. However, Table 9 indicates no significant Task effect for the frequency of interruptive simultaneous speeches.

The analyses of variance of the frequencies of the content-free variables presented in Tables 4 to 8 indicate that the acquaintance conversation was generally more active than the bargaining conversation. There were a greater number of floors, short-duration speeches, and pauses in the former conversation. Despite this greater activity in the

Table 11

Frequency of Interruptive Simultaneous Speech as a Function of Task and Dyad

Dyads within Acquaintance First Group			Dyads within Bargaining First Group		
Acquaintance	Bargaining	Difference	Acquaintance	Bargaining	Difference
32	38	-6	70	52	18
50	41	11	65	39	26
70	101	-31*	51	49	2
41	42	-1	58	73	-15
29	24	5	45	69	-24
83	57	26	55	41	14
45	28	17	64	45	19
49	71	-22	25	51	-26
47	64	-17	65	43	22
70	41	29	46	47	-1
49	45	4	70	52	18
22	28	-6	30	46	-16
			Mean		
49	48	1	54	51	3

*$p < .05$, $df = 1,46$.

acquaintance conversation, in most dyads the frequency of times that an individual spoke during the partner's floor time (simultaneous speech) did not differ significantly between the conversations.

Mean duration measures. The analyses of variance of each of the mean durations of the content-free variables used the same 2 x 12 x 2 repeated measures design as was used in the analyses of the switching pause and simultaneous speech frequencies. The same factors--Order of Presentation, Dyad and Task--were used, with the unit of analysis being the individual subject nested within the Dyad and Order of Presentation factors. Again, the Dyad factor was random and the Task factor was completely crossed over the two other factors.

The analyses of the mean durations of the floor and speech measures are presented first, in Table 12. Examining the results for the floor variable in the top half of Table 12, it will be seen that none of the main or interactive effects was significant. No significant difference was found between the mean floor durations in the acquaintance and bargaining conversation.

The analysis of the mean duration of speeches, on the other hand, (bottom half of Table 12), in addition to the significant Dyad and Task by Dyad (T x D) effects, evidenced a highly significant Task effect. The Dyad effect indicates a high degree of variability of mean speech durations between the 24 dyads in the analysis. The significant Task effect indicates that the mean duration of speeches in the acquaintance conversation ($\overline{X}$ = .67-sec) was significantly lower than the mean duration of speeches in the bargaining conversation ($\overline{X}$ = .87-sec). This main effect is qualified by the significant Task by Dyad interaction. Table 13 shows that, while 9 dyads exhibit significantly shorter durations of speech in the acquaintance relative to the bargaining

Table 12

Analyses of Variance of Mean Durations of Floor and Speech

Source	df	Mean Square	Denominator of F Ratio	F Ratio
		Floor		
Between Subjects	47			
Order of Presentation (O)	1	2.338	(D)	1.089
Dyad (D)	22	2.147	(S)	.488
Subjects (S)	24	4.400		
Within Subjects	48			
Task (T)	1	4.259	(T x D)	3.058
T x O	1	1.195	(T x D)	.858
T x D	22	1.393	(T x S)	.610
T x S	24	2.283		
		Speech		
Between Subjects	47			
Order of Presentation (O)	1	.168	(D)	3.245
Dyad (D)	22	.052	(S)	3.449*
Subjects (S)	24	.015		
Within Subjects	48			
Task (T)	1	1.090	(T x D)	34.733**
T x O	1	.127	(T x D)	4.053
T x D	22	.031	(T x S)	4.063**
T x S	24	.008		

*$p < .05$.

**$p < .001$.

Table 13

Mean Duration of Speech as a Function of Task and Dyad

Dyads within Acquaintance First Group			Dyads within Bargaining First Group		
Acquaintance	Bargaining	Difference	Acquaintance	Bargaining	Difference
.77	1.17	-.40**	.57	.70	-.13
.75	1.27	-.52***	.72	1.27	-.55***
.73	.77	-.04	.83	.70	.13
.66	.74	-.08	.68	.76	-.08
.66	1.05	-.39**	.66	.65	.01
.60	.75	-.15	.68	.92	-.24
.67	1.03	-.36**	.55	.63	-.08
.60	.75	-.15	.61	.54	.07
.63	.77	-.14	.69	.82	-.13
.61	.88	-.27*	.65	.89	-.24
.60	1.07	-.47**	.56	.91	-.35**
.69	1.13	-.44**	.63	.74	-.11
Mean					
.66	.95	.29	.65	.79	.14

*$p < .05$, $df = 1,46$.

**$p < .01$, $df = 1,46$.

***$p < .001$, $df = 1,46$.

conversation, differences in mean durations of speech across the tasks were not significant in the remaining dyads. The significant interaction shown in the bottom half of Table 12 is caused by this variability between dyads.

The analyses of variance of the mean durations of the silence variables, pause and switching pause, are presented in Table 14. No main or interactive effects are listed for the analysis of the pause variable in the top half of this table. Although subjects tended to pause more often in the acquaintance conversation (frequency analysis presented in Table 6), the average length of pauses did not differ between conversations.

A significant Order of Presentation effect is shown for the analysis of variance of the mean duration of switching pauses in the bottom half of Table 14. No other significant effects were obtained. The mean duration of switching pauses was significantly shorter in the Acquaintance First group ($\overline{X}$ = .67-sec) than in the Bargaining First group ($\overline{X}$ = .74-sec).

The analyses of variance of the mean durations of the two simultaneous speech variables, non-interruptive simultaneous speech and interruptive simultaneous speech are presented in Table 15. In this table, it will be noted that none of the main effects or interactions are significant. It can be concluded that the variables were not significantly different between tasks or orders of presentation.

In summary, the analysis of variance of the mean durations of the content-free variables show that only two of the variables differed significantly between tasks or orders of presentation. These were mean

Table 14

Analyses of Variance of Mean Durations of Pause and Switching Pause

Source	df	Mean Square	Denominator of F Ratio	F Ratio
		Pause		
Between Subjects	47			
Order of Presentation (O)	1	.185	(D)	3.080
Dyad (D)	22	.060	(S)	.672
Subjects (S)	24	.089		
Within Subjects	48			
Task (T)	1	.010	(T x D)	.502
T x O	1	.001	(T x D)	.065
T x D	22	.020	(T x S)	.313
T x S	24	.063		
		Switching Pause		
Between Subjects	47			
Order of Presentation (O)	1	.092	(D)	5.100*
Dyad (D)	22	.018	(S)	.435
Subjects (S)	24	.042		
Within Subjects	48			
Task (T)	1	.020	(T x D)	.709
T x O	1	.006	(T x D)	.213
T x D	22	.029	(T x S)	1.656
T x S	24	.017		

*$p < .05$.

Table 15

Analyses of Variance of Mean Durations of Simultaneous Speech

Source	df	Mean Square	Denominator of F Ratio	F Ratio
Non-Interruptive Simultaneous Speech				
Between Subjects	47			
Order of Presentation (O)	1	.061	(D)	1.084
Dyad (D)	22	.056	(S)	1.112
Subjects (S)	24	.050		
Within Subjects	48			
Task (T)	1	.036	(T x D)	1.597
T x O	1	.046	(T x D)	2.019
T x D	22	.023	(T x S)	.535
T x S	24	.043		
Interruptive Simultaneous Speech				
Between Subjects	47			
Order of Presentation (O)	1	.190	(D)	2.680
Dyad (D)	22	.071	(S)	1.435
Subjects (S)	24	.049		
Within Subjects	48			
Task (T)	1	.003	(T x D)	.148
T x O	1	.001	(T x D)	.498
T x D	22	.017	(T x S)	.741
T x S	24	.023		

durations of speech (shorter in the acquaintance than in the bargaining conversation) and switching pause (shorter in the Acquaintance First than in the Bargaining First group). These results stand in contrast to those obtained from the analyses of variance of frequencies presented earlier. In the frequency analyses, significant task differences were yielded for each of the floor, speech, and pause variables.

Relations of Intimacy and Influence to Temporal Patterns of Speech

The two previous sets of analyses demonstrated that speech patterns tend to be unstable across different task conversations, and that some aspects of these patterns differed significantly between the two tasks studied. The third and final set of analyses was intended to assess the importance of the temporal rhythms of speech in determining the outcome of each task. In other words, can the speech patterns of an individual within a dialogue be related to the resultant intimacy or influence of that individual relative to that of the partner? To answer this question, two separate factor analyses, one for each of the conversational tasks, were completed to examine the relationships underlying intimacy, influence, and content-free measures of dyadic interaction.

The first factor analysis considered the relationships between objective and subjective measures of intimacy and content-free measures derived from the acquaintance conversations. In the second analysis, influence (objectively and subjectively assessed) and content-free variables derived from the bargaining conversation were studied. In order to study the behavior of a subject relative to that of her partner, measures obtained from the subject (intimacy, influence, or

content-free) were subtracted from the corresponding measures obtained from her partner. These difference measures were used in the factor analysis. Thus, the dyad was the unit of analysis: discrepancies between subjects' levels of intimacy or influence within a dyad were correlated with discrepancies in the content-free measures.

Each factor analysis utilized principal factor extraction and varimax rotations in order to produce orthogonal factor solutions with variables maximally loaded on one factor. Factor extraction was stopped in each analysis when the eigen value for a factor was less than 1.0. The two correlation matrices from which the factor analyses were computed are presented in Appendix E.

Intimacy. The first factor analysis examined the relationships between objectively and subjectively judged ratings of intimacy and the content-free measures. Two objective measures of intimacy were obtained for each subject, one assessing the intimacy of the subject within the first-half of the acquaintance conversation, the second assessing the intimacy in the second-half of the conversation. The second-half rating, because it expressed the resulting intimacy of a conversation, was used as the objective measure of intimacy rather than the first-half measure (the product-moment correlation between the two measures is .79, $df = 49$, $p < .01$). The dyadic measure was the difference between the two subjects' second-half intimacy levels.

Two subjective intimacy ratings were obtained from each subject, a self-rating and a rating of the partner. Thus, four individual measures were collected from each dyad. The dyadic measure was computed by summing together the two ratings given for a subject (one by the subject, the second by the partner) and subtracting the sum of

the two measures given for the partner.

Because this analysis was chiefly exploratory, all six content-free mean duration measures were included.[1] Dyadic measures were computed for each variable by subtracting the mean duration value obtained from a subject from that obtained from her partner. Previous research has suggested only that more intimate disclosures tend to be longer than less intimate disclosures. Thus, the sole hypothesis in the present analysis was that more intimate subjects would tend to have longer average floor times than their less intimate partners.

The objective intimacy rating for one subject was missing in this analysis. In the correlation matrix used to compute factor loadings, the correlations between this rating and all other variables were based on 25 cases (dyads). The remainder of the correlations were based on 26 dyads.

The results of the factor analysis of the variables measured in the acquaintance conversation are presented in Table 16. Three factors with eigen values greater than 1.0 were extracted which accounted for 77.3% of the total variance. In Table 16, Factor I evidences appreciable loadings ($\pm$ .70) from three variables (see Gorsuch, 1974). The pattern of these loadings suggests that the individual who produced a relatively great amount of interruptive and non-interruptive simultaneous speech (variables 7 and 8, respectively) tended not to pause long relative to her partner (variable 5). Because of the preponderant loading of the corresponding variables, this factor seems best labelled as a Simultaneous Speech factor.

Factor II has substantial loadings on three variables: objectively rated intimacy (variable 1), speech (variable 4), and switching pause

Table 16

Factor Analysis of Acquaintance Conversation

Variable	Factor Loadings		
	I	II	III
1 Intimacy (Objective)	.23	-.76	.38
2 Intimacy (Subjective)	.09	.04	.86
3 Floor	-.60	-.19	.53
4 Speech	.37	.76	.21
5 Pause	-.84	-.26	.09
6 Switching Pause	.51	.75	.04
7 Non-Interruptive Simultaneous Speech	.89	-.06	.19
8 Interruptive Simultaneous Speech	.87	.24	.06
Eigen Value	3.6	1.5	1.1
% Variance	45.0	18.8	13.5

(variable 6). The pattern of these loadings suggests that the relatively quiet individual who responded quickly to her partner was the one who was more intimate. This factor, therefore, seems best labelled as a Responsiveness factor.

Factor III evidences a substantial loading on one variable, subjective intimacy (variable 2). For this reason it is best labelled the Perceived Intimacy factor.

The results of the factor analysis of the acquaintance conversation variables indicate that objectively rated intimacy tended to be associated with the mean durations of an individual's speeches and switching pauses. The individual rated the most intimate in the dyad tended to speak for shorter durations of time and to take less time to respond to the partner's speech (switching pause) than did the individual who received a lower intimacy rating from the judges. The hypothesized positive correlation between objectively measured intimacy and the mean duration of an individual's floor times was not borne out by the analysis.

Influence. The second factor analysis considered the relationships between objective and subjective measures of influence and the content-free variables from the bargaining conversation. Dyadic variables used in this analysis were computed as in the first factor analysis. The dyadic objective influence measure and each of the dyadic content-free mean duration measures were computed by subtracting the values obtained for one subject from those obtained from her partner. Subjective influence ratings were transformed by summing together the two ratings given for one subject (that subject's self-rating plus the rating given the subject by her partner) and subtracting the sum of the two ratings for her partner.

Again, this analysis was considered to be exploratory. It was expected from previous research, however, that a subject's participation in a dyad, measured by the mean duration of the subject's floor time relative to that of the partner, would be loaded on the same factor as both of the influence measures.

The results of this factor analysis are presented in Table 17. Three factors with eigen values greater than 1.0 were extracted which accounted for 75.3% of the total variance. Table 13 shows that Factor I receives substantial loadings ($\pm$.70) from 4 variables, three of which are the same as for Factor I in the last analysis (Table 12). These variables are pause (variable 5), interruptive simultaneous speech (variable 8), switching pause (variable 6), and non-interruptive simultaneous speech (variable 7). The direction of each of the variable loadings is also the same as in the factor analysis of the acquaintance conversation measures, and the factor is interpreted similarly. However, because in the present analysis Factor I is correlated most highly with both silence variables (pause and switching pause) as well as with non-interruptive simultaneous speech, it is called the Silence-Simultaneous Speech factor.

Factor II evidences a high loading from speech (variable 1), but only marginal loadings from floor (variable 3) and objective influence (variable 1). The patterns of the loadings suggest that more influential individuals tended to speak and to hold the floor for longer durations than did their partners. The borderline loadings suggest, however, that the relationships were weak. Due to the single substantial loading on this factor, it is appropriately labelled a Speech factor.

Table 17

Factor Analysis of Bargaining Conversation

Variable	Factor Loadings		
	I	II	III
1 Influence (Objective)	-.08	.48	.67
2 Influence (Subjective)	-.03	-.10	.92
3 Floor	-.69	.49	.15
4 Speech	.18	.92	.02
5 Pause	-.88	-.13	-.21
6 Switching Pause	.82	.09	-.13
7 Non-Interruptive Simultaneous Speech	.70	-.10	-.07
8 Interruptive Simultaneous Speech	.87	.26	-.07
Eigen Value	3.2	1.7	1.1
% Variance	40.2	21.8	13.3

Table 17 indicates that Factor III receives a substantial loading from subjective measure of influence (variable 2) and a marginal loading from the objective influence measure (variable 1). No other variables contribute substantially to this factor and, for this reason, it seens best labelled as an Influence factor. The composition of the factor suggests that the more influential subject within a dyad was also perceived as being more influential by the participants.

The results of the second factor analysis evinced little or no association between the relative influence exerted by an individual, or the relative degree of influence attributed to that individual, and the speech patterns of the participants in the bargaining conversation. At best, the analysis revealed only a weak association between influence and the mean durations of floors and speeches (Table 17, Factor II). The relationship between influence and floors was in the predicted direction as the more influential subjects tended to hold the floor for longer durations than did their less influential partners. However, Factor III (Table 17), the Influence factor, received no substantial loadings from the content-free variables.

Discussion

The present research was undertaken to first, extend the investigation of the stability of dyadic temporal patterns of speech to the situation where an individual, conversing with the same partner, engages in two successive conversations concerning non-competitive and competitive tasks. A second purpose was to compare content-free measures from the different task conversations in order to describe how patterns of speech might differ between the two tasks. Finally, a third and chiefly exploratory purpose of the present research was to describe the relationships between interpersonal and content-free measures of dyadic interaction.

Several authors have noted the wide variability between individuals' temporal patterning of the sounds and silences of verbal communication (e.g., Matarazzo and Wiens, 1972). At the level of the dyad, this was evidenced in the present study by the number of the content-free measures of these speech patterns which varied significantly between dyads, or between dyads in response to the two conversational tasks. Along with this variability, it has been shown that, if circumstances of conversation remain relatively constant, individuals within the dyads tend to display consistent patterns of speech over time (Feldstein and Welkowitz, in press; Jaffe and Feldstein, 1970; Matarazzo and Wiens, 1972). This phenomenon was demonstrated in the present study. The content-free measures of floor, speech (mean duration), and pause were stable across the first and second segments of two successive but different task conversations between the same two persons. However, the effect of changing conversational tasks on the consistency of speech

patterns was also demonstrated. Switching pause and simultaneous speech measures, found to be stable in the acquaintance conversation, were not stable in the bargaining conversation, and none of the content-free variables remained stable across the two conversations. These results indicate that, contrary to previous research, relative to the other subjects the individual did not maintain a consistent pattern of speech across the two tasks.

Changing discussion tasks did not, however, cause only random modification of speech patterns across the two groups of subjects. The analyses of variance revealed that an individual's conversation, when she was asked to get to know her partner (acquaintance task), was more active than when a mild degree of competition was introduced and she was asked to debate her political opinions with her partner (bargaining task). In contrast to her participation in the bargaining task, the individual in the acquaintance conversation tended to alternate floors more often, to speak more often and for shorter durations, and to pause more often.

No overall differences were noted in the average length of time an individual held the floor in each of the tasks, but it was found that the order in which tasks were discussed affected the speed with which she responded to her partner's speech. The group of subjects who were asked to get to know each other as their first task (Acquaintance First group) tended to respond faster to their partner's speech than did the group who completed the bargaining task first.

The pattern of results from the analyses of variance suggests that the greater activity in the acquaintance conversation was apparent at both the dyadic, or interactive level (frequency of floors, or turns),

and at the individual level (frequency of speeches and pauses and, in 9 dyads, duration of speeches). Individuals did not, however, tend to speak 'out of turn' in one conversation more than in the other (simultaneous speech). The rapidity with which individuals responded to the partner's speech (duration of switching pause) appeared to be a characteristic which, once established in the first conversation (faster in the Acquaintance First group), tended to be maintained in the second conversation.

Taken together, the stability and analyses of variance results indicate that discussing two different task in succession (a non-competitive acquaintance task and a competitive bargaining task) had a disruptive effect on subjects' speech patterns. Individuals tended to be more active in the acquaintance than in the bargaining conversation (analyses of variance), but the more active individuals in the acquaintance conversation were not necessarily more active than the others in the bargaining conversation (correlational stability analysis).

The analyses of variance provided a description of the different speech patterns characteristic of the acquaintance and bargaining tasks. Previous research has indicated that these patterns might reflect, in addition to the individual's response to different tasks, the individual's response to the interpersonal relationship established with his or her partner (e.g., Matarazzo and Wiens, 1977; Pope and Siegman, 1972).

Other research has suggested that content-free measures might play a role in determining this interpersonal relationship (see Willard and Strodbeck, 1972). The pattern of causality could, therefore, be bi-directional: speech characteristics could result from or determine the interpersonal relationship. In using intimacy and

influence measures which expressed the resultant relationships between individuals in the dyads, the factor analyses emphasized investigation of the latter hypothesis.

The factor analysis of the bargaining conversation demonstrated no substantial relationship between the content-free measures of speech and the interpersonal influence measures. However, for the acquaintance conversation, a relationship was demonstrated between an individual's speech patterns, relative to her partner's, and the level of intimacy of her speech relative to that of her partner. It was shown that the person who spoke for shorter durations of time and responded faster to her partner tended to be the more intimate person in the dyad. While the factor analysis of the bargaining conversation proved to be inconclusive, that of the acquaintance conversation appeared to support the hypothesized relationship between content-free patterns of speech and content measures of the outcome of a task.

The results of the stability tests of the content-free variables in the acquaintance conversation match closely those reported by Jaffe and Feldstein (1970) and Feldstein and Welkowitz (in press). These researchers tested the stability of the variables within conversations that were similar to the acquaintance conversation. In addition, the results from the acquaintance stability analysis are similar to those reported in a number of studies which tested stability across different psychotherapeutic and job interviews between the same two participants (see Matarazzo and Wiens, 1972).

The stability of speech patterns within more competitive discussions such as the bargaining conversation has not been as well studied. Jaffe and Feldstein (1970) are the only researchers who have reported

results from a competitive discussion (subjects in this study, as in the present study, were asked to discuss differences of opinion). Their results revealed that all four of the variables studied were stable from the first to second halves of the competitive discussion studied, including mean durations of switching pauses. The results obtained in the present study generally replicate Jaffe and Feldstein's findings that content-free variables are stable within conversations.

The major exception to this is the switching pause variable. In the present study, it could not be determined if the differential stability of that variable within each of the tasks was an effect of the tasks themselves or of discussing the two tasks in succession. Given the results of previous research indicating stability within each of the tasks when they are studied separately, it appears likely that the difference was caused by discussing the two tasks successively. This interpretation is further substantiated by the Order of Presentation effect obtained for this variable in the analysis of variance.

The results suggesting relatively little stability in speech patterns from one task to the next was not expected. Whether this instability was due to the demands of the tasks themselves, or to the effect of juxtaposing the two tasks, could not be determined from the correlational analysis. Whichever may be the case, however, the results suggest that temporal speech patterns may be less stable than has been demonstrated in previous research (see Feldstein and Welkowitz, in press; Jaffe and Feldstein, 1970; Matarazzo and Wiens, 1972). This implies that this aspect of an individual's speaking behavior may be more task or topic dependent than has been demonstrated. The

'fast-talker' in one conversation concerning one topic ('fast-talker' compared to other people) may not be as fast as the rest in a second conversation concerning a different task or topic.

While the correlational analyses documented the relative instability of the content-free variables across different tasks, they did not describe the specific patterns characterizing non-competitive and competitive discussions. This purpose was served by the subsequent analyses of variance. These indicated that, in absolute terms, individuals in the non-competitive acquaintance conversation tended to be more active than in the competitive conversation. This was not entirely expected. From a report by Hargreaves (1960), it was expected that an individual's speech in a non-competitive, less well organized conversation (i.e., the acquaintance conversation) would be characterized by a higher frequency of short-duration speeches (less than 1.0-sec) compared to that individual's speech in a more competitive and formally organized discussion (i.e., bargaining). This hypothesis was confirmed by the results from the analysis of variance of speech frequencies. However, the specific pattern of results found in the present study--the higher dyadic and individual level of activity of the acquaintance relative to the bargaining conversation, and the faster response time of an individual to her partner's speech characteristic of the group who participated in the acquaintance conversation first relative to the group who completed the bargaining conversation first--was not anticipated.

In addition to the non-competitive and competitive qualities of the tasks, the greater activity in the acquaintance conversation would appear to have been caused, in part, by a greater degree of anxiety

aroused by this task relative to the bargaining task. There is some research suggesting that anxiety is associated with a higher frequency of utterances (Cervin, 1957) and with shorter durations of response latencies (switching pauses; Craig, 1966; Jaffe and Feldstein, 1970; Siegman and Pope, 1972). Except for Cervin's study, this research has concerned affective arousal due to mild anxiety created in the psychotherapeutic interview situation. In the present study, heightened arousal could have been due to mild anxiety caused by the demand that subjects participate in a more personal conversation, or to a greater degree of emotional involvement in the acquaintance conversation (and in the Acquaintance First group) than in the bargaining conversation (and Bargaining First group).

The hypothesis that subjects were more emotionally aroused in the acquaintance relative to the bargaining discussion is interesting in light of Mortenson's (1974) proposal that verbal activity might be a measure of the emotional intensity of interpersonal relationships. Mortenson cited the results of a pilot study by Cardwell which suggested that competitive (high-conflict) discussions were characterized by a greater degree of activity than were cooperative (low-conflict) discussions. From this, Mortenson surmized that the intensity of conflict in a dyadic interaction might be related to the verbal activity of the antagonists. To the extent that the acquaintance and bargaining tasks may be characterized as involving lesser and greater degrees of conflict, respectively, the results of the present research do not support Mortenson's proposal. However, if the conversations of the present study were indeed characterized by higher emotional arousal in the acquaintance relative to the bargaining conversation, the results

would support Mortenson's basic notion that verbal activity might be related to the emotional intensity of a social interaction.

Although the investigation of the relationships between content-free and interpersonal measures of dyadic interaction was regarded as exploratory, tentative hypotheses were advanced for each of the two factor analyses. It was expected that the relatively more intimate and influential subjects in the acquaintance and bargaining discussions, respectively, would tend to hold the floor for longer intervals of time than would their less intimate or influential partners. No substantial relationships were evidenced between these measures.

Previous research has suggested that intimacy is related to longer durations of utterances (e.g., Altman and Taylor, 1973; Derlaga, Walmer and Furman, 1973; Jourard, 1971; Rubin, 1974). This research has, however, generally involved measuring the intimacy level and duration of a subject's response to a single statement (or series of statements) by another person. In the present study, the evidence from the analysis of the acquaintance conversations suggests that, in a relatively unrestrained dialogue, shorter durations of speeches and switching pauses are more indicative of a higher level of intimacy than are longer duration speeches. Compared to a monologue or a single response, expressions of intimacy in the course of a dialogue appear to be associated with non-verbal (para-verbal or content-free) responsiveness to the partner. An individual who speaks for short durations of time allows the partner greater opportunity to speak; faster responses to the partner's speech would seem to indicate involvement with what the partner is saying. The combination of short durations of speech and fast response times indicates that the more intimate individual might have used more

'back channel' speech (Yngve, cited in Duncan, 1972) signalling with sounds such as 'mm-hmm' agreement or disagreement with the partner.

In this context, previous studies of therapeutic interviews (Matarazzo, Wiens and Saslow, 1965) have shown that such short utterances by the interviewer were followed by an increase in the interviewee's vocalizations. The present results suggest that the interviewee's behavior might be cognitively mediated by his perception of greater intimacy on the part of the interviewer. Given the exploratory nature of the present study, the above conclusion is hypothetical, at best. It seems, however, to explain the results obtained here and in other relevant studies.

Footnotes

[1]Total duration rather than mean duration measures of the content-free variables could have been used in this factor analysis. The literature would appear to suggest that intimacy might be related to the total amount of time spent talking in a dialogue as well as to the average length of time spent talking. However, the correlation between dyadic differences in mean floor time (the variable predicted to be related to intimacy) and differences in total floor time is nearly unity (r = .97, df = 24, p < .001). This suggests that the two variables were essentially the same, and that either could have been used to investigate the hypothesis. Mean floor time was used because it was more easily interpretable as representing the flow of talk between the two persons, and in order to be consistant with the previous sets of analyses.

The same principle held for the factor analysis of the bargaining conversation, where the literature more specifically suggested the use of total floor time rather than mean floor time. Again, the dyadic difference of each of these measures was highly significantly correlated (r = .99, df = 24, p < .001).

Appendix A

Content-Free Speech

Recording and Analysis System

The speech analysis system used in the present study consisted of three interfaced systems: 1) the electronic hardware (microphones and amplifiers) used to transduce vocal sound wave energy into electrical energy; 2) a DEC PDP-11 computer programmed to convert the analog electrical signals to a digital punched paper-tape record of each subject's sound-silence patterns of vocal communication. These records were transferred onto magnetic tape files of an IBM 360-65 computer; 3) a software program, written for the IBM machine, which caused the computer to recreate the data as a memory-array, modify ("filter") the data as specified by the user, and compute the summary statistics of the content-free variables.

Subjects' voices were recorded using pressure sensitive throat microphones held in place with velcro collars passed around the subjects' necks. This insured separate-channel recordings of each subject's voice, and eliminated the need to suppress extraneous environmental noise such as paper shuffling or echos. Wires from each microphone lead to amplifiers, in the same room, with a dynamic range of ±5.0 volts. The amplified signal was conducted outside the room to a Deck PDP-11 computer for real-time recording of each subject's sound-silence patterns.

An Assembler program caused the Deck computer to sample the amplified signal at the rate of 1,000 times per second. The sampled signal, converted to digital, was an eight bit binary number expressing the intensity of the sound waves sensed by the throat microphones. This number was squared (to correct for negative numbers and to better represent the area under the sinusoidal curve) to produce a sixteen bit number, truncated to eight bits, and then added

to a running sum of samples. Every 193-msec (corrected, in later experimentation, to 200-msec), the accumulated sum for each subject was compared to a threshold value to determine if the subject was speaking. The sum was then reset, and the process was repeated. The result of the comparison, whether the subject was recorded as talking or silent, was output onto a visual display (light emitting diode).

The threshold value was the average of two variables called sound and silence. Initial variable values were pre-determined; they could, however, be modified by the experimenter. The depression of a momentary switch caused the respective value to be moved toward the value of the current accumulated sum according to this formula: New Value = (Present Accumulated Sum + Old Value) / 2. Subjects were each asked to read aloud a passage before beginning a conversation, and the sound and silence variables were manipulated by the experimenter until the audio signal over the earphones corresponded with the visual display.

The computer compacted data from each change of state (subjects becoming silent or beginning to vocalize) into two bytes. The first byte was coded to indicate which subjects had been vocalizing during the previous state. The second indicated how long, as a multiple of the 193-msec sampling time, the state existed. These bytes were output onto paper-tape which, with coded bytes indicating the beginning and end of the conversation, provided a record of the sound-silence patterns of speech in the conversation.

The paper tapes were assigned group numbers, transmitted to an IBM 360/65 computer, checked for errors, and stored as members of a

partitioned data set. User-prepared records were read which specified groups, time segments, and two filter parameters to be used for analysis. The specified member of the data set was opened, and the member read into core memory. After translating from EBCEDIC to modified ASCII (reversing an operation performed during tape transmission), the start byte was located, and data were read into a raw data array until the stop byte was encountered.

At this point, the data array could be modified according to the two specified filter values (described below). After the filtering was completed or, if no filtering was specified, the data were compressed by summing the duration bytes of contiguous identical states and analyzed according to an algorithm that tallied occurrances and durations of each of the content-free variables.

At least one event record identifying a speech variable and containing the sum of the corresponding duration bytes was written for each change of state. Speech variables composed of more than one state byte, such as floor time (possibly consisting of speech and silence or simultaneous speech bytes) were identified using event records. When each event record production was complete (for each subject), the event file was submitted to a program which summed the occurances of each speech variable, and output total durations, total frequencies, mean durations, and standard deviations of the durations for each of the variables. When more than one group was submitted for analysis, a new group was read from the data set, and the analysis was repeated.

Before a data array was analyzed for the content-free variables, an option written into the analysis program allowed the user to modify

the array by specifying a combination of two filter parameters. These have been named the verbal acceptance filter (VAF) and the silence acceptance filter (SAF).

The VAF algorithm worked such that each sound state in each subject's record was separately compared to the user specified VAF value. Any sound state less than that value was converted to a silence state, and the data analysis treated it as a silence state. The SAF worked in an inverse manner, converting any silence state that was shorter than the user-specified SAF value to a sound state.

Using one of the filters recursively (to modify and analyse the same conversation at successively greater values of the filter) allowed the user to derive frequencies of the speech and pause variables (using the VAF or SAF, respectively) as successively longer durations of sound (or silence) were required to be analyzed as sound (or silence). In the present thesis, for example, frequencies of speech were determined at an effective VAF equal to the sampling time of 193-msec, then at 386-msec, then at 965-msec (approximately 1-sec, or five sampling units). Arithmetical manipulations of this data then allowed the user to determine the frequencies of speech within the chosen filter durations: less than 386-msec, greater than or equal to 386-msec but less than 965-msec, and greater than 965-msec in the example. Thus, the frequency of speeches from three separate samples of the conversation were obtained. The first, for example, was the frequency of speeches when only sounds less than 386-msec were analyzed. Concantenation of these samples resulted in a frequency distribution for speeches within successive duration intervals. Recursive use of the SAF allowed similar frequency

distributions of pauses to be constructed.

Recursive filtering was used in the present thesis to compare the frequencies of speeches and pauses of various durations across different conversations. The remainder of the analyses in the present thesis utilized content-free data from conversations which were analyzed with the SAF set at 386-msec (2 sampling units). This decision was somewhat arbitrary in that it was not based on preliminary study of the effects of the filters. Most researchers have used data processing techniques which converted silences shorter than a value between 200-msec to 300-msec to sound (see, e.g., Brady, 1965; Cassotta, Feldstein and Jaffe, 1964; Goldman-Eisler, 1968). In addition, many researchers (notably Cassotta, Feldstein and Jaffe, 1964) have used a 300-msec sampling time. Both the silence bridging values and the sampling times used by most research groups are longer than the 196-msec sampling time which was used in the present research. It was thought that the use of the SAF, set at 386-msec, would mimic the data collection and analysis procedures of these research groups. However, no attempt was made to verify this.

Appendix B

Derivations of Objective Measures of Intimacy and Influence

Contents

Appendix B-1

Intimacy

Judges used the same scale and basic guidelines for evaluating the acquaintance conversations as were given the subjects. Listening to tape-recordings of entire conversations, judges gave intimacy ratings from 1 (not at all intimate) to 8 (very intimate) to each subject for each topic as it was listened to. Judging was done within the framework of the experimental situation: the level of intimacy of two persons, introduced by a third, and asked to get to know each other was judged (compare with the instructions given to subjects on the questionnaire given after the acquaintance conversation in Appendix C-3).

The list of 13 topics devised by Taylor and Altman (1966) for use in studies of interpersonal relationships, was used to train judges to differentiate discussion topics. Initial training of the judges also had them rate and discuss the intimacy-scaled stimuli given by Taylor and Altman (1966) until agreement was reached between both judges' ratings and the ratings given by Taylor and Altman. Finally, judges listened to, rated, and discussed recordings of six pilot conversations before beginning to rate the experimental conversations.

In an attempt to derive a global measure of intimacy for specific time intervals (rather than by topic discussed), the conversation was divided into eight segments: the first four minutes and the seven successive three-minute segments. The intimacy ratings for each of these segments were the highest of the per-topic ratings received by the subject during that segment. The mean of the first four segment ratings constituted the intimacy rating for the subject in the first

one-half of the conversation. Similarly, the mean of the second four segment ratings was the intimacy rating for the subject in the second half of the conversation. These measures were the ones used as dependent measures in the acquaintance conversations, and were checked for inter-judge reliability.

Intimacy ratings were defined across two general areas: personal (about the individual's personal family or social life) or public (school or general social issues and controversies). In general, higher ratings were given for the disclosure of important personal information expressed emotionally, or an expression of a personal stance on a public issue.

Judges referred to a written guideline developed by them on the course of their training, consisting of the scaled points 1, 2, 4, 6, and 8. The scale points 3, 5, and 7 were used when a judge thought that the intimacy level of a particular topic fell between those given on the guideline. The following is the list of scaled points, with guidelines used by the judges:

Rating	Label
1	A bare statement of a fact that was not difficult to express.
2	A statement of fact with minimal expressed evaluation.
4	A statement about self that was midly difficult to express. A personal opinion expressed in a strong manner, without much detail.
6	An important statement about self-fears, joys, sorrows--without much detail. Strong agreement or disagreement with the partner on a controversial public issue.

8 Description of a personal problem or triumph, including details. Very emotional and personalized expression of a stance taken on a controversial public issue.

The following is a list of examples, taken from the cassette tape-recordings, of statements by the subjects and the ratings given by the judges.

Rating		Example
1	a)	"I'm a second year student in psychology."
	b)	"Well, I come from a family of nine."
2	a)	"This is my third year in school, and I don't like it."
	b)	A long description of the subject's travels in Europe, detailing the sights visited.
4	a)	"I knew a girl who was a vegetarian. She ended up getting sick." (This was said after the partner had stated that she was a vegetarian, and had described at length its importance to her.)
	b)	A discussion of the government's Native Peoples Policy and how, in the subject's opinion, the policy was a poor one. The subject related her personal observations on this problem which were evolved while living in the Northern Territories.
6	a)	"I don't know how I'm going to tell him (my boyfriend) that I don't have any teeth...." (The subject was 18-years old.)
	b)	A detailed description of social activities enjoyed by the subject with her boyfriend.
8	a)	A subject's discussion of her earlier fear of becoming "crazy" and her later resolution of this.

Rating	Example
8	b) A detailed description of a subject's relationship with her former husband, her divorce, and subsequent difficulties raising her children.

Appendix B-2

Influence

Influence scores for each subject were computed from the following formula: score = 100 x $(p_2 - p_1) / (1 - p_1)$, where p_1 was the Spearman rank order correlation between the subject's and partner's initial (individual) rank orderings of the list of professions, and p_2 was the rank order correlation between a subject's initial ranking and the ranking decided upon by the dyad. p_1 was thus a measure of the initial disagreement within a dyad; p_2 was a measure of the degree of concordance between a subject's initial opinions and the dyad's final choices. p_1 was subtracted from p_2 (in the numerator of the equation) to provide a measure of this concordance relative to the degree of initial disagreement. The numerator thus expressed the degree of influence exerted by a subject in moving the group decisions toward her initial opinions and away from the baseline, defined as the degree of initial disagreement.

This influence measure was weighted by $(1 / (1 - p_1))$ in order to make inter-dyadic comparisons. Theoretically, the maximum influence a subject could have exerted would have been represented by $(1 - p_1)$, a perfect correlation between initial and final choices minus the degree of initial disagreement. Thus, the within dyad influence score (the numerator) was weighted by the theoretical maximum score for the dyad (the denominator). The score was multiplied by 100 and rounded to the nearest integer to produce a scale with possible range of -100 to +100. The final influence score, expressing the degree of concordance between pre and post-communication opinions, is consistant with the method of determining the influence of a communication in opinion change as described by Lin (1973).

Appendix C

Questionnaires Administered During the Experimental Sessions

Contents

Appendix C-1

Biographical Questionnaire

NAME _____

Before beginning this study on communication in groups, it is necessary to obtain some information from you individually. The following questionnaire and short personality test will facilitate this. All information will be kept confidential. The purpose of this information will be explained after the study has been completed, in the meeting that was discussed with you previously. Should you wish an explanation of the personality test, and your score on it, arrangements will be made at this meeting to have this made available to you.

Please answer all of the following questions as carefully as possible. You should be able to complete them within about 10 minutes time.

1. Date of birth: Day Month Year

2. Place of birth: City Province Country

3. Where does your family live now?
   City Province Country

4. Your mother tongue English French Other_____

5. Mother tongue of your father: English French Other_____

6. Mother tongue of your mother: English French Other_____

7. Do you ever use a second language in conversation? No Yes(specify)_____

8. If yes, please rate your degree of proficiency:

   1)Excellent 2)Very Good 3)Good 4)Not good 5)Poor

9. Faculty:_____

10. Year in University: 1 2 3 4 5 6 7 8

11. (Planned) College Major:_____

12. How many brothers and/or sisters do you have?_____

13. How many are older than you?_____

Appendix C-2

Personality Scale

The Dominance Scale from the

California Personality Inventory (Gough, 1969)

Adapted by Martindale (1971)

COLLEGIATE PERSONALITY INVENTORY

Directions: This page and the pages which follow contain a series of statements. Read each one and decide how you feel about it. If you agree with it or feel that it is true of you, place a heavy pencil mark through the letter "T" in the right margin. If you disagree with a statement or feel that it is untrue of you, place your mark through the letter "F".

1. I doubt whether I would make a good leader..... T F

2. I think I would enjoy having authority over other people..... T F

3. I find it hard to keep my mind on a task or job..... T F

4. I have sometimes stayed away from another person because I feared doing or saying something that I might regret afterwards..... T F

5. When in a group of people I have trouble thinking of the right things to talk about..... T F

6. School teachers complain alot about their pay, but it seems to me that they get as much as they deserve..... T F

7. I don't blame anyone for trying to grab all he can get in this world..... T F

8. Every citizen should take the time to find out about national affairs, even if it means giving up some personal pleasures..... T F

GO ON TO THE NEXT PAGE

2/

9.	I would like to belong to several organizations.....	T	F
10.	I am certainly lacking in self-confidence.....	T	F
11.	When I work on a committee I like to take charge of things.....	T	F
12.	If given the chance, I would make a good leader.....	T	F
13.	Sometimes at elections I vote for a man about whom I know very little.....	T	F
14.	I like hunting very much.....	T	F
15.	A person does not need to worry about other people if only he looks after himself.....	T	F
16.	I can honestly say that I do not really mind paying all taxes, because I feel that's one of the things I can do for what I get from the community.....	T	F
17.	When prices are high you can't blame a person for getting all he can while the getting is good.....	T	F
18.	In school, I find it very hard to talk before the class.....	T	F
19.	I am a better talker than a listener.....	T	F
20.	I would be willing to give money to help right a wrong, even though I was not mixed up in it in the first place.....	T	F
21.	We should cut down on our use of oil, if necessary, so that there will be plenty left for people fifty or a hundred years from now.....	T	F
22.	When the community makes a decision, it is up to each person to help carry it out, even if he had been against it.....	T	F
23.	I would rather have people dislike me than look down on me.....	T	F

GO ON TO THE NEXT PAGE

3/

24. I try to see what others think before I take a stand..... T F

25. People should not have to pay school taxes if they do not have any children..... T F

26. In a group, I usually take the responsibility for getting people introduced..... T F

27. I would be willing to describe myself as a pretty "strong" personality..... T F

28. There are times when I act like a coward..... T F

29. I must admit I am a pretty fair talker..... T F

30. I have strong political opinions..... T F

31. I am usually a leader in my group..... T F

32. I seem to do things that I regret more often than other people do..... T F

33. Disobedience to any government is never justified..... T F

34. I enjoy planning things and deciding what each person should do..... T F

35. I would rather not have very much responsibility for other people..... T F

36. I usually have to stop and think before I act, even in trifling matters..... T F

37. It is pretty easy for people to win arguements with me..... T F

38. I have not lived the right kind of life..... T F

39. I have a natural talent for influencing people..... T F

40. I like to give orders and get things moving..... T F

41. I am embarrassed with people I do not know well..... T F

GO ON TO THE NEXT PAGE

4/

42. The one to whom I was most attached and whom I most admired as a child was a woman (mother, sister, etc.)..... T F

43. I'm not the type to be a political leader..... T F

44. People seem naturally to turn to me when decisions have to be made..... T F

45. I dislike having to talk in front of a group..... T F

46. I have more trouble concentrating than others seem to have..... T F

Appendix C-3

Post-Acquaintance Conversation Questionnaires

Contents

NAME _____

Below are several questions regarding the conversation you just participated in, where you were asked to get to know each other as well as possible. For each question, circle the number which best represents your thoughts and/or feelings about this "getting to know you" conversation. Please answer all questions.

1. Did you enjoy the conversation?

1 2 3 4 5 6 7 8
Not at all Very much

2. How openly did you express yourself during the conversation?

8 7 6 5 4 3 2 1
Very open Not open

3. How openly did your partner express herself, in your opinion?

1 2 3 4 5 6 7 8
Not open Very open

4. To what extent do you feel you directed the conversation?

8 7 6 5 4 3 2 1
Very much Not at all

5. To what extent do you feel your partner directed the conversation?

1 2 3 4 5 6 7 8
Not at all Very much

The following questions are designed to ascertain how well you feel you and your partner got to know each other in the "getting to know you" conversation. In order to do this, we would like to know how intimate was the information you disclosed about yourself to your partner (question 6), within the context of the situation--i.e., within the context of the two of you being introduced by a third party and asked to get to know each other. Question 7 asks the same, but focuses on your ideas about how intimate was the information disclosed to you by your partner.

6. In the spaces on the next page, please list at least 5 of the subjects that you talked about. Please try to list those items which you feel were the most intimate for you. Rate each of these items on a scale from 1 (Not at all intimate) to 8 (Very intimate). Write the number which best expresses how intimate it was for you next to the item.

6. (continued)

Rate each item from 1 to 8. 1 means Not at all intimate, 8 means Very intimate.

ITEMS	RATINGS
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____
5. _____	_____

Others (include ratings):

7. In the spaces below, please list at least 5 of the subjects discussed in which your partner disclosed information about herself. Again, attempt to include those that you regard as the most intimate. Please rate them on the same intimacy scale as in the previous question. Remember that 1 means Not at all intimate, and 8 means Very intimate.

ITEMS	RATINGS
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____
5. _____	_____

Others (include ratings):

Please circle the number which best expresses your thoughts and/or feelings for each of the following questions.

8. The most intimate of the questions you asked your partner was:

1	2	3	4	5	6	7	8
Not at all intimate							Very intimate

9. The most intimate of the questions asked of you was:

8	7	6	5	4	3	2	1
Very intimate							Not at all intimate

10. In your opinion, who disclosed the most information about herself?

1	2	3	4	5	6	7	8
Your partner							You

11. How much about yourself--experiences, thoughts, feelings--would you now be willing to disclose to your partner?

8	7	6	5	4	3	2	1
A great amount							Very little

NAME: _____

Please rate your partner on the following scales by checking one of the six spaces on each line. ANSWER EVERY ONE:

FALSE	____	____	____	____	____	____	TRUE
REPUTABLE	____	____	____	____	____	____	DISREPUTABLE
SOCIABLE	____	____	____	____	____	____	UNSOCIABLE
WISE	____	____	____	____	____	____	FOOLISH
UNSUCCESSFUL	____	____	____	____	____	____	SUCCESSFUL
NEGATIVE	____	____	____	____	____	____	POSITIVE
KIND	____	____	____	____	____	____	CRUEL
BAD	____	____	____	____	____	____	GOOD
GRATEFUL	____	____	____	____	____	____	UNGRATEFUL
COOPERATIVE	____	____	____	____	____	____	UNCOOPERATIVE
DISHONEST	____	____	____	____	____	____	HONEST
REALISTIC	____	____	____	____	____	____	UNREALISTIC
SELFISH	____	____	____	____	____	____	GENEROUS
PRACTICAL	____	____	____	____	____	____	IMPRACTICAL
TRUSTING	____	____	____	____	____	____	DISTRUSTING
COLD	____	____	____	____	____	____	WARM
FRIENDLY	____	____	____	____	____	____	UNFRIENDLY
AGGRESSIVE	____	____	____	____	____	____	UNAGGRESSIVE
STRONG	____	____	____	____	____	____	WEAK
UNFAIR	____	____	____	____	____	____	FAIR
UNSTABLE	____	____	____	____	____	____	STABLE
TRUSTWORTHY	____	____	____	____	____	____	UNTRUSTWORTHY
PEACEFUL	____	____	____	____	____	____	VIOLENT

Appendix C-4

Post-Bargaining Conversation Questionnaires

Contents

NAME_____

Below are several questions concerning your reactions to the film project discussion you just participated in. For each question, please circle the number which best represents your thoughts and/or feelings about the film discussion. Answer all questions.

1. Did you enjoy the discussion?

1 2 3 4 5 6 7 8
Not at all Very much

2. Were you satisfied with the final dicisions?

8 7 6 5 4 3 2 1
Very much Not at all

3. Do you think you presented your arguments convincingly?

1 2 3 4 5 6 7 8
Not at all Very much

4. To what extent do you feel you influenced the decisions?

8 7 6 5 4 3 2 1
Very much Not at all

5. Do you think that your partner presented her arguments convincingly?

1 2 3 4 5 6 7 8
Not at all Very much

6. To what extent do you feel your partner influenced the decisions?

8 7 6 5 4 3 2 1
Very much Not at all

NAME: _____

Please rate your partner on the following scales by checking one of the six spaces on each line. ANSWER EVERY ONE:

FALSE	____	____	____	____	____	____	TRUE
REPUTABLE	____	____	____	____	____	____	DISREPUTABLE
SOCIABLE	____	____	____	____	____	____	UNSOCIABLE
WISE	____	____	____	____	____	____	FOOLISH
UNSUCCESSFUL	____	____	____	____	____	____	SUCCESSFUL
NEGATIVE	____	____	____	____	____	____	POSITIVE
KIND	____	____	____	____	____	____	CRUEL
BAD	____	____	____	____	____	____	GOOD
GRATEFUL	____	____	____	____	____	____	UNGRATEFUL
COOPERATIVE	____	____	____	____	____	____	UNCOOPERATIVE
DISHONEST	____	____	____	____	____	____	HONEST
REALISTIC	____	____	____	____	____	____	UNREALISTIC
SELFISH	____	____	____	____	____	____	GENEROUS
PRACTICAL	____	____	____	____	____	____	IMPRACTICAL
TRUSTING	____	____	____	____	____	____	DISTRUSTING
COLD	____	____	____	____	____	____	WARM
FRIENDLY	____	____	____	____	____	____	UNFRIENDLY
AGGRESSIVE	____	____	____	____	____	____	UNAGGRESSIVE
STRONG	____	____	____	____	____	____	WEAK
UNFAIR	____	____	____	____	____	____	FAIR
UNSTABLE	____	____	____	____	____	____	STABLE
TRUSTWORTHY	____	____	____	____	____	____	UNTRUSTWORTHY
PEACEFUL	____	____	____	____	____	____	VIOLENT

It has often been noticed that, after discussing a topic, the discussants have difficulty remembering their original opinions. This is one reason why, for example, notes are kept at meetings. To investigate this, we would like you to indicate below (middle column) your initial listing, by order of importance, of the professions for the film--what you remember to be your initial decisions, before the discussion.

For the same reason, would you also indicate below (right column) the final listing of the 15 professions by order of importance that you and your partner decided upon--the final group decisions agreed upon.

In both cases, please include all 15 professions, even if you are not absolutely certain of the ordering.

PROFESSION	INITIAL DECISIONS	GROUP DECISIONS
A-TEACHER		
B-PENSIONER		
C-INDIAN		
D-IMMIGRANT		
E-ESKIMO		
F-ROYAL CANADIAN MOUNTED POLICEMAN		
G-FACTORY WORKER		
H-SOCIAL WORKER		
I-HOUSEWIFE		
J-SEPARATIST		
K-A CHILD		
L-POLITICIAN		
M-LAWYER		
N-STUDENT		
O-BUSINESSMAN		

Appendix C-5

Opinion Scale

NAME _____

A documentary film, based on interviews, will be made depicting life in Canada. The film will be shown to secondary school students. The primary goal of this film is to make it as realistic as possible, presenting various aspects of Canadian life and traditions.

Below is a list of 15 possible professions (or life-styles) that may be portrayed in this film. You are requested to help decide which of these will be included in the film. Decide the order of importance of these professions for the film--the order in which, in your opinion, they are important in representing Canadian life--and indicate your decisions by writing the numbers 1 to 15 in the spaces provided. Please note: 1 indicates the most important, 2 the second most important, and so on to 15, the least important.

PROFESSION	ORDER OF IMPORTANCE
A-TEACHER.....	_____
B-PENSIONER.....	_____
C-INDIAN.....	_____
D-IMMIGRANT.....	_____
E-ESKIMO.....	_____
F-ROYAL CANADIAN MOUNTED POLICEMAN...	_____
G-FACTORY WORKER.....	_____
H-SOCIAL WORKER.....	_____
I-HOUSEWIFE.....	_____
J-SEPARATIST.....	_____
K-A CHILD.....	_____
L-POLITICIAN.....	_____
M-LAWYER.....	_____
N-STUDENT.....	_____
O-BUSINESSMAN.....	_____

Appendix D

Instructions for the Conversational Tasks

Contents

Appendix D-1

General Instructions

After the subjects had been seated in the experimental room and introduced to each other, the following was read (verbation but in a conversational manner):

As you know, this is a study of two-person communication. I mentioned to you on the phone that I would ask you to converse with each other, and that I would record your conversation. It is necessary to record your voices on separate channels. That's the reason for these throat microphones (pointing) you see here. This was followed by the sentence, "Now, before we start, I would like you to put the microphones on, and we'll test the equipment (again) to be sure that your voices are coming through clearly." If the conversation was the second of the session, this was the first sentence of the instructions for the second conversation, and the word "again" (shown in parentheses) was added.

The following points were expressed to the subjects in the next step, while they were putting on the microphones. The exact timing and wording varied according to the difficulties encountered with the microphones.

1. The microphone goes just to the side of your Adam's apple with the hole facing your neck.
2. The collar should be tight--so that it is just noticeably uncomfortable.
3. Movement of the microphone creates static. For this reason, please avoid adjusting the mike after you get it on properly. Also, try to avoid pulling on the cord or a lot of moving around in your chairs.

4. For the same reason--the static--I ask that you not smoke or chew gum.
5. We'll take a break in 30 to 45-minutes when you can remove the equipment and smoke if you want to.

Appendix D-2

Instructions for the Acquaintance Task

The following instructions were read before the acquaintance conversation, after the equipment had been tested. The phrase in parentheses was added if the conversation was the second for the dyad.

OK, we're ready to begin. (The instructions for this conversation are a bit different from those for the last. Now...) The two of you have just met each other this morning--afternoon--evening; and I assume that you don't know each other well. During the next 25-minutes, I'd like you to try and get to know each other as well as possible. Talk about anything you wish. I do ask that you converse with each other for 25-minutes. I'll leave the room and return in 25-minutes to tell you when the time has elapsed. Any questions?

Remember to be careful not to adjust or pull on the microphones during the conversation. When I tell you over the intercom to begin, try to get to know each other as much as you want and is possible in 25-minutes. Please do not talk with each other until I give the start signal.

Appendix D-3

Instructions for the Bargaining Conversation

The following instructions were read before the bargaining conversation, after the equipment had been tested. The phrase in parentheses was added if the conversation was the second for the dyad.

OK, we're ready to begin. (The instructions for this part are a bit different from those for the last. Now...) The two of you have just determined separately what professions, or life styles, you think are the most representative of Canadian life and traditions. Now I would like you to do the same thing together, as a group.

Here are 15 index cards, each with one of the 15 professions written on it. Discuss with each other your original choices, and come to an agreement about how you, as a group, want the professions ordered--from most to least important. Stack the cards by order of importance, that is, the most important at the top, the least important at the bottom. I'll collect them from you when you've finished.

Each of you should defend your initial choices. Really explain to the other person your reasons for choosing them, and try to convince her of your point of view. It is also important, however, that you reach final group decisions about the importance of these professions in the film.

Remember that the film will be done in an interview format; that it is to be as realistic a portrayal as possible of Canadian life and traditions; and that it will be shown to secondary-school students.

Do you have any questions?

This should take about 30 to 45-minutes. When you're finished, one of you can notify me by saying, "We're finished," over the intercom.

Please don't get up or take off the microphones until I have returned to the room. Also, remember to be careful not to adjust or pull on the microphones during the conversation.

OK? Please do not talk with each other until I give the signal to begin.

Appendix E

Correlation Matrices for the Factor Analyses of the Bargaining and Acquaintance Conversations

Table

Correlation Matrix for the

Factor Analysis of the Acquaintance Conversation

Variable	Correlations						
	2	3	4	5	6	7	8
1 Intimacy[a] (Objective)	.17	.29	-.26	-.08	-.34	.22	-.06
2 Intimacy (Subjective)		.14	.08	.10	.06	.23	.18
3 Floor			-.17	.47	-.37	-.39	-.53
4 Speech				-.55	.69	.31	.44
5 Pause					-.66	-.61	-.70
6 Switching Pause						.37	.56
7 NSS[b]							.76
8 ISS[c]							

Note: $n = 26$, except where noted. $r = \pm .39$ required for significance at $p < .05$ ($df = 23$).

[a] $n = 25$; $r = \pm .40$ required for significance at $p < .05$ ($df = 24$) (two-tailed).

[b] Non-interruptive simultaneous speech.

[c] Interruptive simultaneous speech.

Table

Correlation Matrix for the

Factor Analysis of the Bargaining Conversation

Variable	Correlations						
	2	3	4	5	6	7	8
1 Influence (Objective)	.39	.29	.32	-.07	-.07	-.13	.04
2 Influence (Subjective)		.15	.00	-.14	-.08	-.10	-.10
3 Floor			.27	.43	-.43	-.57	-.39
4 Speech				-.27	.15	.05	.38
5 Pause					-.67	-.56	-.68
6 Switching Pause						.42	.71
7 NSS[a]							.48
8 ISS[b]							

Note: $n = 26$; $r = \pm .39$ required for significance at $p < .05$ (two-tailed).

[a]Non-interruptive simultaneous speech.

[b]Interruptive simultaneous speech.

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