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PATTERNS OF COHERENCE IN THE CONVERSATION OF HIGH AND LOW INVOLVED SPEAKERS

The Ohio State University Ph.D. 1984

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PATTERNS OF COHERENCE IN THE CONVERSATION
OF HIGH AND LOW INVOLVED SPEAKERS

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

By
William Allen Villaume, B.A., M.Div., M.A.

* * * * *

The Ohio State University
1984

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To Susie and Margaret
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tivated me to finish the dissertation before the wedding.
I give her this dissertation as my wedding present so that
we might be fully free on our honeymoon to share our love
for each other and our joy at being husband and wife.
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CHAPTER ONE

INTERACTION INVOLVEMENT AND COHERENCE

The rise of empirical methodology in human communication research saw the application of social psychological methods to the source-message-receiver model of communication. Many of the earliest studies were done by social psychologists (e.g., the Yale studies of the 1950s) or by communication researchers trained in social psychology. These studies assumed that each stage in the communication model was best conceived of as a variable or as a set of variables to be controlled and manipulated in order to ascertain the effect on the total process. Typically, source and message variables were operationalized and the effects upon receivers were measured. Many of these source and message variables were lifted from rhetorical theory; not surprisingly rhetorical theory was confirmed to a great extent.

Subsequent research in this variable-analytic tradition manifested the following developments:

1. The strictly linear process was initially augmented by the inclusion of feedback; eventually the process
was conceptualized as a two-way transaction such that all participants are simultaneously senders and receivers.

2. The introduction of multivariate research designs allowed for increasingly sophisticated investigation of the interaction among variables.

3. Systems theory was utilized to provide a more wholistic approach to the proliferation of finely grained communication variables operative in the communication process. Particularly important was the emphasis on the synergistic nature of systems whereby a system was no longer the simple sum of its parts. Systems theory focused on how the constituent elements meshed together and affected each other reciprocally. Thus the operation of the total system became the better explanation of communicative events than any single system component in isolation.

Starting in the early 1970s many scholars rejected the easy assumption of human communication as a naturally non-problematic occurrence and centered their research on how communication is possible at all. As Ellis (1982) states, "The nature and structure of the communication system becomes the phenomenon of interest, not the effects of the system" (p. 45).
In concert with similarly dissenting movements within sociology (ethnomethodology as represented by Garfinkel, Sacks, Schegloff, and Jefferson), linguistics and anthropology (the ethnography of communication as developed by Hymes), these researchers have increasingly focused on the fragile and complex phenomenon of everyday talk.

The common assumption made by these researchers is that talk is a pragmatic accomplishment of considerable magnitude. Thus their research endeavored to answer the questions of how talk is possible and what contributes to successful talk.

This study stands at the point of juncture between two lines of communicative research responding to the theoretical concerns just cited. The first track, namely research in communicative competence, has studied everyday talk by trying to isolate the competencies required of individuals so that they may participate fluently and purposely in everyday social interactions which are grounded in talk.

Discourse analysis, on the other hand, has focused more on the characteristics of the talk itself in order to analyse the structural and functional patterns which lend talk its overwhelming sense of everyday reality. Within the last three years discourse analysts have devoted considerable attention to how conversants achieve and demonstrate the coherence of their conversation.
Ultimately these two lines of research should converge inasmuch as the structural and functional patterns of talk represent the range of discourse resources which individuals master to greater or lesser degrees as skills. As a first step in fostering the convergence of these two research traditions, the following section will present a discourse perspective on the issues currently being debated by researchers in communicative competence.

**Communicative Competence from a Discourse Perspective**

Recent reviews of the research in communicative competence have demonstrated a lack of agreement on how it is to be defined and explicated. There are considerable differences as to what constitutes both communication and competence. Specifically these differences surface in four issues of debate, namely:

1. Whether competence is to be defined as a cognitive phenomenon or as a broader behavioral phenomenon. This issue is often phrased as whether competence is knowledge or performance.

2. Whether communicative competence entails any consideration of communicative effectiveness.

3. Whether competence is a trait-like characteristic of the individual or a characteristic of joint interaction among individuals.
4. What are the dimensions which constitute communicative competence. The following review considers each of these issues from the perspective of discourse analysis.

**Competence as Knowledge or Performance.** In normal English usage competence entails satisfactory performance. It would be contradictory to say "John is a competent communicator but he does not communicate satisfactorily". This normal tie between competence and performance, however, was set aside by Chomsky (1965) in his radical restructuring of linguistic methodology. In effect Chomsky reduced competence to the rather restricted cognitive domain of being able to judge the well-formedness of sentences. Citing the initial progress in syntactic theory, various communication scholars (Larsen, Backlund, Redmond, & Barbour, 1978; McCroskey, 1982) have argued for a similar cognitive definition of communicative competence. Discourse analysts, on the other hand, would argue against such a cognitive redefining of communicative competence, citing the following problems which resulted from Chomsky's reductionist definition of competence:

1. The initial unified progress in syntactic theory has given way to a bewildering morass of competing syntactic systems.
2. Syntactic and semantic problems are increasingly being solved on the pragmatic level where conditions of performance are integral elements of the analysis.

3. Knowledge of grammar on a cognitive level has been unable to explain how people communicate in natural conversation.

4. Judgments of well-formedness beyond the sentence level rapidly lose validity and reliability even if some rudimentary performance conditions are stipulated.

These reasons have led discourse analysts and ethnographically oriented linguists such as Hymes (1971) to call for a broader methodology in the study of language and communication. Indeed it was Hymes who first utilized the concept of communicative competence in contrast to Chomsky's cognitive conceptualization of competence. Thus there is a strong consensus that the communicative use of language on a discourse level cannot be validly studied apart from its performance.

Given that almost all researchers in communicative competence agree on the existence of cognitive, affective and behavioral components of communicative competence, it is difficult to see what Larson et al. (1978) and McCroskey (1982) gain by redefining communicative competence as "the
ability of an individual to demonstrate knowledge of the appropriate communicative behavior in a given situation" (McCroskey, 1982, p. 2). All their research concerns can be stated in terms of the interaction among these three relatively independent components. Perhaps the only unstated methodological advantage of a cognitive redefinition of communicative competence would be the justification of a heavy reliance on paper and pencil instruments over against the more time consuming analysis of actual communicative behavior.

In conclusion, a discourse perspective seriously questions the validity of any cognitive redefinition of communicative competence but is quite receptive to the investigation of how cognitive and affective factors influence the production of coherent competent discourse.

**Competence and Effectiveness.** The second issue under debate concerns whether a competent communicator must be an effective communicator. Wiemann (1977) defines communicative competence as

> the ability of an interactant to choose among available communicative behaviors in order that he may successfully accomplish his own interpersonal goals during an encounter while maintaining the face and line of his fellow interactants within the constraints of the situation.

In contrast, McCroskey (1982) argues that effectiveness is neither necessary nor sufficient to communicative competence. In fact, McCroskey's argument against effectiveness
is the key premise mandating his cognitive redefinition of communicative competence.

From a discourse perspective, both sides debating the relation of competence and effectiveness have conflated two different types of effectiveness, namely illocutionary effectiveness and perlocutionary effectiveness. Any speaker must make clear to his/her interlocutor what illocutionary acts he/she has performed. The interlocutor must be clear about what statements, questions, commands etc. the speaker has made. Of course, illocutionary effectiveness is no guarantee of perlocutionary effectiveness, i.e., that the interlocutor will be persuaded or convinced by these statements, questions, and commands. However, illocutionary effectiveness is a necessary condition for perlocutionary effectiveness and thus a criterial attribute of the competent communicator. Or to express this point somewhat differently, a competent communicator is able to engage another person in coherent conversation in order to accomplish his/her ultimate interpersonal goals. Indeed, a coherent conversation demands illocutionary effectiveness of both communicators even if neither communicator achieves perlocutionary effectiveness.

**Competence as Trait or Interaction.** Initially communicative competence was formulated as a trait-like characteristic of individuals which held constant across situations.
Recently, however, numerous scholars have questioned this noninteractive conceptualization of communicative competence. Wiemann and Kelly (1979, 1981), Spitzberg (1983), Wiemann and Bradac (1983), Cupach and Spitzberg (1983), and Spitzberg and Hecht (1984) argue that competence is a dyadic concept and hence most properly predicated of interactions and not interactants. They wish to highlight the manner in which the interactants mesh to form competent interaction which is coherent at a minimum and hopefully fulfilling on a relational level. Diez (1983) specifically calls for consideration of how speakers weave their utterances together to create the ongoing coherence of discourse. Coherent discourse is dependent upon the interactants' skill in making links to previous utterances. Daly (1983) advocates research which would differentiate the competence of conversations as a result of the particular context and the particular mix of interactants. Citing research in small group leadership and marital communication, he argues that the conversation should be viewed as the basic unit of analysis which reflects both the trait-like qualities which the interactants bring to the conversation and the characteristics of the situation.

Research in the coherence of conversation demonstrates that coherence is a collaborative accomplishment whereby each interactant must respond to the contribution of other
interactants in light of the social demands of the situation. Thus coherence bears a strong relationship to communicative competence not only because coherence subsumes illocutionary effectiveness but also because coherence is a collaborative accomplishment reflecting the influence of specific discourse contributions by individual speakers in a specific situation.

Dimensions of Communicative Competence. Much of the research on communicative competence has been motivated by the desire to isolate various component dimensions of competence. For example, Wiemann (1977) presents a model with five dimensions, namely, affiliation/support, social relaxation, empathy, behavioral flexibility, and interaction management. For a survey of other models delineating dimensions of communicative competence see Wiemann and Backlund (1980) or Brunner (1984).

From a discourse perspective most of these dimensions which have been proposed are higher order behaviors which presuppose the ability to converse coherently with another. For example, in Wiemann's model, lexical choices reflecting the relative status and affiliation of the interactants bear on the dimensions of affiliation/support and behavioral flexibility. Statements acknowledging one's perceptions of the other are included in affiliation/support. Empathy is carried by statements of understanding and feeling for
the other (Wiemann, 1977, pp. 198-199). Clearly none of these verbal behaviors represent the structural core of coherence in conversation.

Interaction management is probably the most frequently included dimension of communicative competence. In fact, Wiemann (1977) stressed interaction management as "the sine qua non of competence" (p. 199). The following are the specific behavioral characteristics listed by Wiemann (1977) under this dimension:

1. Interruptions of the speaker are not permitted.
2. One person talks at a time.
3. Speaker turns must interchange.
4. Frequent and lengthy pauses should be avoided.
5. An interactant must be perceived as devoting full attention to the encounter (p. 199).

Aside from the last item, these behaviors basically constitute the ability to partake fluidly and smoothly in the allocation of conversational turns.

In some additional comments Wiemann (1977) develops the notion of "topic control" as a key element in interaction management although he does not list any specific behaviors associated with topic control. Initially Wiemann contends that topic control must be both effective, insofar as a speaker gets to talk about his/her topics, and inoffensive, insofar as the interlocutor is not alienated by the speak-
er's moves to control topic. Later, in reporting an experimental test of his model of communicative competence, Wiemann seems to expand topic control to allow the other interactant access to the control of topic. Thus "topic control is the extent to which each individual contributes to deciding what is to be talked about at any given time during the interaction" (Wiemann, 1977, p. 201). Bilateral topic control is considered competent; unilateral topic change is an "interaction management error" (Wiemann, 1977, p. 202). However, there is no explicit definition offered of what constitutes the laterality of topic change. It would seem reasonable that Wiemann is referring to the difference between abrupt explicit topic changes accomplished by one speaker in the span of one utterance and topic shifts evolving during the span of several utterances by both speakers. Essentially then Wiemann has reduced topic control to the manner of topic change. In summary, the verbal characteristics of communicative competence seem to be smooth turn taking and fluid topic changes.

Communicative competence should be able to account for the common observation, noted by Grimes (1975, pp. 33-34), that some people produce better formed texts that are easier for others to understand. Smooth turn taking and fluid topic changes, however, are only two of a number of important structural characteristics of competent coherent con-
versational text. There are many additional verbal characteristics which contribute to communicative competence. For example, in terms of topics there should be some assessment of the extent of topic development and the degree to which topic elements from both speakers are included in the joint text. Similarly the degree of a speaker's attention to the interaction needs to be explicated in terms of how the speaker ties back to the utterances of the interlocutor. Such discourse expansions will increase the validity and scope of communicative competence.

There is one dimension of communicative competence which appears to bear a fundamental relationship to the ability of a speaker to engage another in coherent conversation. Cegala (1981) has proposed interaction involvement as the extent to which an individual focuses his/her consciousness on the joint communicative interaction with another person. On a prima facie level, mutual collaboration in the production of coherent conversation would seem to require all speakers to focus on what is occurring among them. The following section will discuss the theoretical nature of the interaction involvement, its operationalization by the interaction involvement scale, and the results of research with the interaction involvement scale. Finally a rationale will be developed for studying the relationship between interaction involvement and the coherence of conversation among high and low involved communicators.
Interaction Involvement

In a conversation the consciousness of the participants is intersubjective insofar as each speaker is conscious of self, the listener, and the listener's consciousness of the speaker. As the conversation unfolds each participant's consciousness ideally merges into a flow that unites both participants. At its height conversation fits Goffman's (1957) description of "a unio mystico, a socialized trance" (p. 47). The conversants may be so thoroughly focused on each other and the topic of talk that they are not easily distracted by the immediate environment.

Discourse analysts have generally acknowledged the necessity for involvement on the part of all participants in a conversation. Gumperz (1982) states that "once involved in a conversation, both speaker and hearer must actively respond to what transpires by signalling involvement either directly through words or indirectly through gestures" (p. 1). This obligation to signal involvement seems to be at the base of one of Wiemann's behavioral cues to interaction management, namely, "an interactant must be perceived as devoting full attention to the encounter" (Wiemann, 1977, p. 199). Goffman notes that when spontaneous involvement fails, a participant may put forth a contrived act of "affected involvement", but must be careful not to affect involvement too well lest he/she be held accountable for un-
derstandings he/she does not possess (Goffman, 1957, pp. 54-55).

On the semantic and pragmatic level of discourse, speech act theorists have emphasized the apprehension of the communicative intentions of the speaker. Grice (1957) analyzes "non-natural meaning" such that

\[ 'A meant (nn) something by x' \text{ is (roughly) equivalent to 'A intended the utterance of } x \text{ to produce some effect in an audience by means of the recognition of this intention' (p. 385).} \]

Consequently, communication is based on the recognition of the speaker's intention to communicate. This recognition of intention is the key premise in the logic of conversational implicature which allows for a multitude of indirect forms of communication (Grice, 1975). Such a recognition of intention presupposes sufficient involvement in interaction so that we are aware of the other's assignment of meaning not only to his/her own actions but also to our actions. Thus conversational implicature would fail without a sufficient degree of involvement in the interaction. Similarly a number of other discourse structures and functions presuppose the speaker's awareness of how the interlocutor is interpreting the speaker's messages.

On the relational level of discourse each conversant claims an identity for him/herself which Goffman (1967, p.9) terms their "face". Through the choice of specific message elements each conversant formulates a communicative
strategy (a "line") which presents not only his/her own face but also preserves the face claimed by his/her interlocutor. Conversation may falter seriously if the speaker should fail to protect the face of the other. Much of Goffman's work describes the system of tacit rules which spell out the obligation a speaker has to be aware of and protective of the other. In order to do competent relational face-work in conversation a speaker must be attentive to the comments of his/her interlocutors and aware of how they interpret the conversation.

In summary then, the major levels of conversation presuppose a focused involvement in the flow of conversation. Without such involvement it is highly likely that conversation will experience lapses of coherence. At such points the conversants may choose to reinvolve themselves sufficiently to repair the conversation in some fashion. Otherwise the conversation will continue in a relatively incoherent fashion or even terminate.

Intuitively we know that interaction involvement is not a binary on-off phenomenon but rather is a matter of degree. At various times speakers and listeners become more or less involved in conversation. A normally high involved person may become momentarily distracted, disturbed, self-conscious, or preoccupied (Goffman, 1957, p. 49). Some people, however, report low interaction involvement as
their normal characteristic mode of participation in conversation. Goffman (1957) describes such people as "chronically misinvolved" (p. 59). Talking with such people may be a distant and uneasy affair.

Following Goffman's work, Cegala has defined interaction involvement as the "extent to which an individual participates with another in conversation" (Cegala, Savage, Brunner, & Conrad, 1982, p. 229). In order to operationalize this construct Cegala (1981) developed the Interaction Involvement Scale (i.e., IIS) as a self-reported measure of a person's characteristic level of interaction involvement. Thus interaction involvement is an interactively conceived construct that bears trait-like characteristics in its operationalization. This study proposes to use this particular combination of features to determine whether the IIS scores of two conversants can predict the degree to which these conversants will collaborate to create coherence in conversation. Two high involved conversants should create more coherent conversation than two low involved conversants.

In a series of studies (Cegala, 1981, 1983, 1984; Cegala et al., 1982) Cegala developed and validated the IIS. The current version of the instrument(1) has eighteen items which describe the person's reactions, feelings and behav-

(1) Cf. Appendix A for the complete IIS.
iors during social interaction. The subjects respond to each item on a seven point Likert-type scale which ranges from "very much like me" to "not at all like me" (Cegala, 1981, p. 113).

Based on a sample of 1,802 respondents Cegala et al. (1982) reported that the eighteen items of the IIS cluster to form three related factors. (2) The first factor, which accounts for approximately 30% of the total variance of the IIS scores, is labelled responsiveness and indexes a person's ability to produce utterances appropriate to the social situation. The items loading on this factor typically exhibit relative certainty about how to act or respond (e.g., "Often in conversations I'm not sure what to say; I can't seem to find the appropriate lines"). The second factor is perceptiveness and typically accounts for about 15% of the total variance of the IIS. This factor reflects a person's ability to assign appropriate meanings to the actions of others and to discern their assignment of meanings in return (e.g., "During conversation I am sensitive to others' subtle or hidden meanings"). The third factor is labelled attentiveness and usually accounts for about 10% of the total variance in IIS scores. This factor assesses how much an individual typically attends to conversation or conversely how much an individual is preoccupied

(2) Cf. Appendix A for the eighteen items and their major factor loading.
during conversation (e.g., "My mind wanders during conversations and I often miss parts of what is going on").

**Summary of Research on Interaction Involvement**

Research on the construct validity of the IIS first investigated the relation of the IIS to other measures of psychological traits and personality characteristics. Research has consistently shown that interaction involvement bears a significant inverse correlation to neuroticism, communication apprehension, and social anxiety, and a significant positive correlation to self-esteem, sociability, assertiveness and Wiemann's self report measure of communicative competence (Cegala, 1982a, 1982c; Cegala et al., 1982). These results would seem to suggest that

1. low involved persons experience more negative emotions (i.e., fear and anxiety) during social interaction than high involved persons

2. high involved persons feel more positively about social interaction than low involved persons.

Overall then, interaction involvement seems to have a significant affective component.

Experimental data in Cegala (1984) supports the relationship of interaction involvement and affective state beyond the trait level. Subjects were paired, given six minutes to converse freely with each other and then given
twenty minutes to engage in competitive negotiation with each other. After each communication episode subjects reported their feelings and moods during the interaction. These self-reported mood states were significantly predicted by the subjects' scores on the IIS. Specifically, interaction involvement directly correlated with positive affect (i.e., proud/strong, positive/friendly) and inversely correlated with negative affect (i.e., fear, anger, anxiety).

In summary, low involved communicators seem to have a distinctly different affective experience of social interaction than high involved communicators. Apparently this negative emotionality causes the low involved communicator either to be internally preoccupied during interaction or to withdraw from interaction. In either case the interaction becomes relatively more distanced, uneasy, and incoherent.

The experimental data in Cegala (1984) also reveal cognitive manifestations of interaction involvement. After each communication episode the subjects were also asked to recall details of their own talk and their partner's talk. Low involved persons recalled less information about the conversation and the negotiation session than the high involved persons. There was also indication that the composition of the dyad had some effect on the recall of de-
tails. The dyads combining a low and a high involved speaker recalled more single facts about self and other than either the high-high or low-low dyads.

Research on the behavioral manifestations of interaction involvement in actual communication has found significant relations between involvement and nonverbal behavior generally believed to indicate emotionality and anxiety. Cegala, Alexander and Sokuvitz (1979) and Cegala et al. (1982) found low interaction involvement to be associated with less eye gaze while speaking, especially for males. Cegala (1978) found that low involved subjects demonstrated significantly more body focused gestures than high involved subjects. Cegala et al. (1982) spelled out specific sex differences in how interaction involvement relates to body movement, gesturing and eye gaze. They hypothesized that these differences may be due to differences in how males and females express emotionality. In this sense the nonverbal behavioral manifestations of interaction involvement also confirm the affective component of interaction involvement.

The initial investigation of the verbal characteristics of interaction involvement has centered on higher order relational behaviors. Cegala (1981) reported that low involved subjects utilized different "facework" techniques than high involved subjects when asked to elicit sensitive
personal information from a conversational partner. Analysis of the transcripts indicated that low involved subjects were more likely to request the desired information explicitly without attempting to make the request seem coherent in light of the prior conversation. High involved subjects managed to develop the conversation so that the desired information was germane and salient at the point of request. Thus the high involved subjects were better able to manage the coherence of their conversation than low involved subjects.

Other behavioral investigations of interaction involvement focused on observers' and participants' ratings of the communicative behavior of high and low involved persons. Brunner (1984) showed videotapes of six minute unstructured conversations to neutral observers who then rated the communicative behavior of the conversants. There were no significant differences in the ratings given to the high and low involved communicators. In contrast, Cegala and Rippey (1984) reported significant results when members of ongoing small groups rated each other for task-oriented and socio-emotional leadership behavior. They found that the IIS scores accounted for 16% of the variance in the ratings of leadership style by self and others. The discrepancy between these results would seem to lie in two possible factors:
1. The raters in the Brunner (1984) study were asked to judge only six minutes of conversation whereas the raters in Cegala and Rippey (1984) were judging ongoing communicative behavior of considerable duration.

2. The conversations rated in the Brunner (1984) study were unstructured and had few pragmatic goals aside from the conversants becoming acquainted while maintaining the talk for a duration of six minutes. Cegala and Rippey (1984) tapped small groups working on class projects with specific goals to be achieved.

It would seem reasonable that low involved subjects have a conversational style that allows them to appear competent and coherent in unstructured situations but which does not provide the strategic control necessary to achieve specific pragmatic goals as smoothly and coherently as high involved conversants. This would also accord with the previously mentioned results of Cegala (1981) where low involved communicators exhibited less coherent management of facework in the strategic socicitation of sensitive information during conversation.

Beyond these studies there has been no direct investigation of the verbal behavior of high and low involved communicators in conversation. The conceptual significance of
interaction involvement would seem to bear directly on the ability of high and low involved communicators to participate in the mutual collaboration necessary to create and maintain the coherence of conversation. This study will examine the coherence achieved in conversation by high and low involved communicators. The following section will review the literature on coherence in conversation and develop a rationale for the use of Hasan's (1984) Cohesive Harmony Index as a measure of textually based coherence in conversation.

Coherence: A Review of the Literature

Over the last decade the cohesion and coherence of discourse has received a great deal of attention. Halliday and Hasan (1976) surveyed the various cohesive devices available to speakers and writers of English. Their work stimulated much research not only because scholars now had a taxonomy of cohesive devices, but also because scholars interpreted Halliday and Hasan (1976) as having proposed an elementary theory of coherence. Within the field of communication, scholars investigating discourse and conversation became interested in coherence (Benoit, 1979; Haslett, 1983; Nofsinger and Boyd, 1980; Planalp and Tracy, 1980; Tracy, 1982; Villame, 1982). Most recently McLaughlin (1984) provided an extensive and substantive review of the
research on coherence in conversation. Craig and Tracy (1983) edited a collection of essays demonstrating the wide variety of sophisticated theoretical approaches to conversational coherence within the field of communication.

Much of this literature relies on an intuitive sense that discourse "hangs together" (Hasan, 1984; Levy, 1979; McLaughlin, 1984; Markels, 1981; Villaume 1982). Together with an observation of the closely entwined etymology of cohesion and coherence (Hawes, 1983; Hopper, 1983), this intuitive sense is taken as a naturalistic rationale for whatever theory of coherence is subsequently presented. There appears in retrospect to have been little actual analysis of what dimensions the judgment of coherence takes when made by actual communicants. Generally it was assumed that the intuitive sense of coherence was based on a unidimensional judgment. Consequently most early theories of discourse coherence were markedly unidimensional in identifying the source of coherence as one process or structure.

Sometimes the intuitive sense of coherence was taken as a discourse parallel to the judgment of sentence grammaticality prominent in Chomsky's appeal to competence. The study of discourse could then be based on judgments about the coherence of selected segments of discourse. Such an approach was most easily embraced by those who defined well-formed discourse as a distinct subset of all the pos-
sible combinations of well-formed sentences. Ruhl (1973) discusses how a theory of discourse based on the semantics of Katz and Fodor (1963) conceives of coherent discourse as a set of conjoined well-formed sentences that do not lead to any contradictions. Judging coherence is equivalent then to certifying lack of contradiction within a string of well-formed sentences. This approach, whereby coherence is a judgment manifesting linguistic competence, has not become particularly widespread although it was initially adopted by some linguists (cf. judgments of "sequituity and nonsequitivy" in Fillmore, 1981, p. 147).

More often though, recognition of the intuitive sense of discourse coherence entailed a multifaceted approach emphasizing the investigation of discourse in its natural context. The typical methodology used transcripts of conversations in a search for patterns of structure and/or strategy in the production and interpretation of coherent discourse and in the repair of incoherent discourse. Within this approach a consensus seems to have emerged that

1. discourse may be judged to be coherent on a number of different levels,
2. coherent discourse is multifunctional, and
3. coherence may be differentially based in linguistic structure and interpretive strategy in various contexts and situations (Craig and Tracy, 1983; McLaughlin, 1984).
The greatest difficulty facing researchers in cohesion and coherence has been the widely varying definitions given these terms. Despite the common etymological roots of the two terms, there is almost a universal tendency to differentiate the terms in some manner instead of equating them. However, the manner of differentiation has been quite varied.

In one line of research (Gumperz, 1982; Markels, 1981; Villaume, 1982; Vuchinich, 1977) cohesion has been defined as the superordinate term denoting the fullest sense in which discourse hangs together. Coherence is defined then in some subordinate sense. Markels (1981) explicates cohesion in terms of unity plus coherence. Under this analysis, unity is achieved through the paradigmatic processes involved in chains of referents running through a text, and coherence is achieved through orderly arrangement of the unified material by various syntagmatic processes. Similarly, Villaume (1982) accounted for Vuchinich's (1977) experimental findings for cohesive, partially cohesive, and noncohesive utterances in terms of the interaction of the paradigmatic relations of Nofsinger and Boyd's (1980) topicality procedures (i.e., cohesive ties) and the syntagmatic relations of Vuchinich's (1977) logical operations procedures (which were a form of coherence procedure). Cohesive
utterances were explicated as topical and coherent, partially cohesive utterances as topical but not coherent, and noncohesive utterances as nontopical and not coherent.

Another line of research attempts to assign cohesion and coherence to different levels of discourse. De Beaugrande (1981), for example, depicts cohesion as grammatical dependencies in the surface text and coherence as semantic relations underlying the surface text. Marcus (1980) argues that if a dependency relation between textual elements is syntactic, then it is cohesion whereas if it is semantic, then it is coherence. Widdowson (1979) associates cohesion procedures with the propositional development of discourse, and coherence procedures with the illocutionary development of discourse.

The final line of research represents the emergent consensus whereby coherence is posited as the superordinate term and cohesion is defined as one means of building coherence. Levy (1979) argues that the ordinary usage of coherence suggests a broad concern with the comprehensibility of discourse in contrast to cohesion which suggests structural binding. McLaughlin (1984) is quite representative in defining cohesion as:

the property of a conversation that its successive utterances can be seen to be about the same set of elements, usually evidenced through such devices as anaphora that are visible in the conversational text

and coherence as:
the sense in which a discourse may be said to 'hang together'; the relevance of its successive utterances both to those that precede them and to the global concerns of the discourse as a whole. (p. 270)

The conclusion shared by many researchers (Benoit, 1979; Brown & Yule, 1983; Ellis, 1983; Hobbs, 1978; McLaughlin, 1984) is that cohesion is not sufficient to establish coherence. It should be noted that Halliday and Hasan (1976) also share this conclusion even though they are sometimes mistakenly criticized for arguing that cohesion is sufficient for coherence (cf. Brown & Yule, 1983). In fact, Hasan (1984) argues quite specifically that coherence requires a "calibrated" usage of cohesive devices in discourse. A sequence of utterances may be chained together by cohesive devices and still be relatively incoherent (McLaughlin, 1984).

This consensus (which posits coherence as the superordinate term) breaks down in the face of the question of how necessary cohesion is to coherence. Ellis (1983), Hasan (1984), Haslett (1983), and Hobbs (1978) argue that coherence is realized in the use of cohesive devices. Thus as a first step in the analysis of coherence they would focus on how cohesive devices are used in text. Gumperz, Aulakh, and Kaltman (1982) demonstrate how analysis of the use of cohesive devices is crucial to understanding coherence patterns in cross-cultural communication between native Brit-
ish speakers and Indians and Pakistanis speaking English as a second language. Other researchers (McLaughlin, 1984; Sabsay & Foster, 1982; Tracy, 1982) tend to minimize the influence of cohesive devices and look to more macroscopic sources of coherence in conversation. Typically researchers looking at coherence in terms of social alignment (Ragan, 1983) and goal oriented strategies (Jacobs and Jackson, 1983b) seldom mention cohesion at all.

In summary, coherence is defined as the degree to which discourse hangs together in a sensible and unified fashion. Cohesive devices are a grammatical means which may be utilized to a greater or lesser extent in the realization of coherence. Cohesion by itself is not considered sufficient for coherence.

Another point of consensus needs to be mentioned briefly. The relationship between text and coherence was quite unclear for awhile. For example, de Beaugrande (1981) argued that text had to meet seven constitutive conditions including cohesion and coherence. Thus by definition text had to be coherent. How then could a researcher deal with incoherent discourse? Most researchers though have defined text as the objective record of words spoken or written in the course of communication. The coherence of the given text is then open to investigation. Analysis may cite specific cohesive devices in the text or interpretive proce-
dures utilized on the part of the listener/reader in response to the text. Indeed such a conception of text is flexible enough to allow for a combination of cohesive structure and interpretive strategy in accounting for coherence.

**Major Issues in Coherence**

Having achieved consensus on the nature of coherence, cohesion, and text, research into the nature of coherence advanced quickly. The unidimensional conceptualization of coherence quickly grew into a multidimensional conceptualization acknowledging that coherence exists on many levels in discourse (e.g., syntactic, semantic, and pragmatic). Multidimensional research of coherence, however, is still in its infancy inasmuch as scholars still situate their analyses on a single level. There has been little success in building a comprehensive account of how coherence is achieved across various levels simultaneously. Similarly, aside from Hasan's (1984) Cohesive Harmony Index, there has been little success in measuring coherence on any level of discourse.

Before explaining the nature of the Cohesive Harmony Index, it is necessary to survey the current issues of debate concerning coherence. On the basis of this survey a model of coherence will be proposed in order to situate precisely
that portion of discourse coherence which is measured by the Cohesive Harmony Index. Only then will it be possible to assess the appropriateness of using the Cohesive Harmony Index to measure the conversational coherence of high and low involved conversants.

Local vs. global coherence. The first subject of debate is the effective range of coherence procedures. If an utterance is coherent with respect to immediately prior utterances, then the utterance is said to be locally coherent. Semantic cohesive ties such as anaphora and ellipsis, and lexical ties such as repetition and hyponymy, and semantic coding of given/new information are major means for constructing local coherence. In its most stringent formulation, local coherence demands ties to the immediately preceding utterance (Foster, 1982). More often though local coherence is explicated as displaying ties to one or more utterances in the preceding segment of discourse (Benoit, 1979; Nofsinger & Boyd, 1980; Halliday & Hasan, 1976). Analysis of the use of cohesive devices highlights the dependency of one constituent in the current utterance on a constituent in some prior utterance (Halliday & Hasan, 1976). Such cohesive devices generally can span no more than several utterances (Vuchinich, 1977); otherwise interpretation becomes difficult (Ellis, 1983).
Local coherence can also be explicated as the relation of the whole current utterance to prior utterances. Included herein are structural relations such as adjacency pairs (Benoit, 1979), propositional coherence relations (Agar & Hobbs, 1982; Hobbs, 1979; Milic, 1973 & Winterowd, 1970 cited in Markels, 1981) and illocutionary sequences (Jacobs & Jackson, 1983a). In all these cases though, the relation is of the current utterance to immediately prior utterances. Thus local coherence procedures, no matter whether operating on constituents or whole utterances, create a connectedness only to the immediately prior discourse environment. Coherence over a large span of discourse is derived through a chaining effect (if only local coherence procedures are considered).

Global coherence procedures span and unify much larger segments of discourse. Tracy (1982) cites two major approaches to global coherence; namely, story grammars and other schema, and various hierarchical macrostructures such as primary presuppositions (Keenan & Schieffelin, 1976), and macropropositions serving as topic (van Dijk, 1980, 1981). Rumelhart (in Markels, 1981, p. 52) emphasizes finding a schema which will account for the whole passage as a unity. Other global coherence procedures seek to relate larger segments of discourse to a speaker's goals (Jacobs & Jackson, 1983a, 1983b), the conversational situation (Ragan, 1983), or both (Nofsinger, 1983).
Reichman (1978) and Tracy (1982) developed relatively global coherence procedures associated with issue and event context spaces. These spans or segments of discourse are generally shorter than the spans accounted for by the above global procedures. In essence then coherence procedures associated with context spaces are midway between local procedures and the most expansive global procedures. This is clearly evident inasmuch as a context space may consist of only one utterance or as many as ten to twenty utterances. The sequencing of context spaces relates to the coherence of the larger discourse (Tracy, 1982); at the same time, Reichman (1978) argues that differential usage of cohesive devices is related to the progressive sequencing of context spaces in conversation.

In summary, four levels of coherence procedures ranging from the most local to the most global were identified as follows:

1. cohesive devices operating on constituents of utterances
2. coherence procedures operating on whole utterances
3. coherence procedures operating on context spaces (spans of utterances)
4. coherence procedures operating on larger segments of discourse or discourse as a whole.
Although Tracy (1982) proposed a strict dichotomy of local versus global coherence, Agar & Hobbs (1982), McLaughlin (1984), van Dijk (1973), and van Dijk and Kintsch (1983) argue that any well-formed discourse must meet both local and global conditions on coherence. However, in any given discourse the relative contributions to coherence by local and global procedures may vary. Agar and Hobbs (1982) suggest coherence procedures are complementary as bottom-up and top-down discourse processing.

**Levels of Coherence.** Implicit in the above discussion of local and global coherence is a wide variation in the linguistic and social levels on which coherence is constructed and manifested. Various scholars have offered typologies of these levels. Benoit (1979) distinguishes structural, formal, and topical coherence, but does not relate these types of coherence in any fashion. Crow (1983) observes that coherence "may be analyzed as act, sequence, or episode"(p. 136) and implies that there is an ascending hierarchy among these levels. McLaughlin (1984) differentiates propositional and topical coherence from functional coherence. Pearce and Conklin (1979) spell out four levels of rules which produce coherence in conversation. Their rules operate in ascending order on propositions, illocutions, episodes, and social archetypes. Ellis (1983) discusses the depictive, speech act, and discourse levels of
language in relation to coherence. Finally Fillmore (1981) and van Dijk and Kintsch (1983) utilize the traditional linguistic distinction of syntactic, semantic, and pragmatic coherence.

While there is considerable agreement that coherence exists and functions on a number of levels, there is considerable debate over which levels are more important for which type of analysis and how the various levels are functionally related.

For the purposes of this study the following levels of coherence will be stipulated:

1. semantic
2. pragmatic
3. relational/episodic

Rather than conceiving of these levels as independent self-sufficient modules, an interplay among the levels will be assumed such that facts noticed on one level may be accounted for on another level. Although these levels will be presented in a roughly ascending order, it should not be concluded that the coherence of a text will become manifest in the same order. Additionally phonological, morphological, and syntactic coherence (wellformedness) will be assumed within utterances.

Semantic coherence, sometimes called "texture" (Halliday & Hasan, 1976), is concerned with the consistency, related-
ness, and order of propositional content within discourse. On a local level, a constancy of discourse objects, events, and actions is maintained and coordinated through the use of cohesive devices such as anaphora and ellipsis (Halliday & Hasan, 1976), conjunctions (Ruhl, 1973; Halliday & Hasan, 1976), theme/rheme distinctions (Grimes, 1975; Halliday, 1967a, 1967b, 1968; Carlson, 1983), and the distribution of given/new information (Prince, 1981). On a more global level, the semantic relations between successive utterances may be characterized in terms of coherence relations (Hobbs, 1979; Milic, 1973; Winterowd, 1970) such that the content of the one utterance is serving to elaborate, explain, or illustrate the content of the prior utterance. Finally on the most global level, the coherence of propositional content would focus on macrostructures such as context spaces, topical macropropositions, and discourse representations encompassing the content of the discourse to the present moment.

Pragmatic coherence goes beyond the directly or literally represented meaning to assess the various inference processes used to flesh out the propositional meaning. At this level various constraints associated with language and conversation (i.e., the conditional relevance of adjacency pairs, the constitutive conditions of speech acts, Grice's cooperative principle and its four associated maxims, mean-
ing postulates binding lexical items, etc.) are utilized to infer either directly or indirectly meaning not literally expressed in the text. For example, conversational implicature might establish an indirect speech act such that the specific propositional content is disregarded, extended or modified. Pragmatic coherence on a local level would thus focus on adjacency pairs and speech act sequences (Jacobs & Jackson, 1983a), types of conversational moves performed by utterances (Edmondson, 1981; Goldberg, 1983; Kreckel, 1981), and pragmatic connectives (McLaughlin, 1984). A global approach to pragmatic coherence might explicate a whole segment of discourse as serving to perform a macro-speech act or as bound together by a pragmatic topic or intent (McLaughlin, 1984). In essence, pragmatic coherence derives from inferential processes applied to the semantic content of the text.

Relational/episodic coherence is concerned with various relations of the social world as either directly evidenced in the text or indirectly inferred from the text. Knowledge of social identities, roles, situations, and goals becomes relevant to understanding the connection between utterances on both the local and global levels. For example, understanding the rules of politeness and tact would be necessary for explicating the coherent collaboration of conversants attempting to achieve conversational goals.
Thus Jacobs and Jackson (1983a) contend that "coherent conversation requires a cooperative pursuit of goals as opposed to simple individual pursuit of goals" (p. 54). Sigman (1983) argues that the coherence of discourse entails the social appropriateness, significance, and permissability of discourse. He shows how context may trigger specific rules which impact on the coherence procedures available to conversants. Hawes (1983) explicates coherence as the dialectical management of truthfulness and appropriateness in a given social situation. Nofsinger (1983) emphasizes the strategic or tactical element inherent in the coherence of courtroom conversation between witnesses and lawyers. Hopper (1983), Mura (1983), and Ragan (1983) stress the production of coherence in conversation through aligning actions used to manage social identities and roles. These aligning actions include such conversational features as licensing violations, accounts, formulations, metatalk, qualifiers and so forth. All these approaches conceive of coherence as the collaborative management of social relations in an episodic context. Thus although the text might be perfectly coherent and understandable on a linguistic level, the conversation as a larger social production may be incoherently enacted.
The final issue of debate concerning coherence recognizes that interpretive procedures are integral to the production and maintenance of coherence in conversation. The radical position, exemplified by Hopper (1983), argues that speech is the manufacture of noises; interpretation is the manufacture of coherence (p. 81).

Such a position entails that coherence is not a feature or characteristic of text but rather the outcome of cognitive processes (Brown & Yule, 1983; de Beaugrande, 1981; Gumperz, 1982). Thus Brown and Yule (1983), for example, criticize Halliday and Hasan (1976) for a "text-as-product view" of coherence whereby cohesive devices reside within the text. Advocating "discourse-as-process", Brown and Yule (1983) present an extensive argument against treating text as product.

Nevertheless text is a product present for at least a moment in space and time. It is the point of contact between communicants. In written communication the produced text can be extensively examined, critiqued, and evaluated by the writers and readers. It exists in objective form for long periods of time. Society expends considerable educational resources to improve the quality of written text. For conversants, however, spoken text exists for only the briefest of moments before the precise words die in short term memory. Researchers can access the text through the
relatively objective format of recording. Thus conversational text-as-product assumes significance for the researcher as output of the encoding processes of the speaker and as input to the interpretive processes of the receiver. The analysis of text-as-product necessarily points beyond itself to the analysis of discourse-as-process. For the researcher, text-as-product provides cues for the analysis of discourse-as-process.

The fleeting existence of conversational text does not preclude text-as-product from providing cues to be utilized by conversants in the course of collaborating in conversation. Without text (either verbal and/or nonverbal) there is no communication. However, explicit textual cues such as cohesive devices cannot force coherence. The major question then becomes whether the presence of certain explicit textual features (such as cohesive devices) is required for coherence or whether inferential processes and interpretive strategies beyond the text can impart coherence to the text.

Scholars who argue for the primacy of interpretive process often cite discourse fragments two or three utterances in length which are straightforwardly coherent without any cohesive devices in the text. For example, Brown and Yule (1983) cite the following discourse segment:

1. A: There's the doorbell.
2. B: I'm in the bath. (p. 196)
Obviously the coherence results from interpretive strategies operating on social schema governing doorbell episodes. However extended segments of discourse are extremely difficult without the use of cohesive devices because cohesive devices are one important way in which the speaker can ease the interpretive burden of the receiver.

This debate becomes quite specious if it is recognized that even explicit cohesive devices require considerable interpretation. The determination of antecedents for anaphoric pronouns is not a mechanistic matter as suggested by Ellis (1982). As will be explicated in detail later in this chapter, certain features of text-as-product become input to inferential processes much as the social schema of a doorbell episode served as input to the inferential process which rendered coherent the above cited text. Thus discourse analysis needs to distinguish the different types of inference processes used to impart coherence to conversation. Then these inference processes need to be characterized in terms of their relative reliance on input from within the text or from outside the text. Finally the general principles governing these inferential processes need to be determined.

As a first step in this direction Wilson and Sperber (1981) have presented a four category taxonomy of inference processes in discourse. These categories are presented in
the order of increasing indirectness of inference. Wilson and Sperber (1981) also contend that increasing indirectness is correlated with the amount of work required of the receiver. The categories they present are as follows:

1. directly interpreted expression of a proposition (involving interpretation of cohesive devices such as anaphora)
2. logical implication of a proposition by the direct expression of another proposition (includes meaning postulates, presuppositions, and conventional implicatures)
3. direct pragmatic implication (based on directly interpreted expression plus an additional premise from shared knowledge)
4. indirect pragmatic implication (based on directly interpreted expression plus an additional premise added to shared knowledge).

In this analysis the directly interpreted expression serves as premise to the subsequent three types of inference. If the direct interpretation of utterances should become problematic, the whole structure of inference would also become problematic.

The importance of inference to discourse resides in the delicate balance between the said and the unsaid (Ellis, 1982; Beach, 1983). If too much is said, conversation be-
comes overly redundant and hence boring; if too little is said the hearer may have to infer too much and hence be left bewildered and lost. Several discourse principles directly bear on this balance between the said and the unsaid:

1. Brown and Yule (1983, p. 67) propose the "principle of analogy" (i.e., things will tend to be as they were before) and the "principle of local interpretation" (i.e., if there is a change, assume it is minimal). Operating in tandem, these principles allow for greater leniency in leaving unsaid that which is relatively constant in conversation.

2. Similarly a second principle derives from combining Kreckel's (1981) hypothesis of cognitive relativity with Grimes' (1975) principle of informational cohesiveness. Kreckel (1981) argues that the degree of understanding potentially achieved in verbal exchange is a direct function of the degree of convergence of the interactionally relevant concepts held by the interactors and their shared conventions for expressing them (p. 4).

Grimes (1975) proposes the principle of "informational cohesiveness" whereby the speaker may cease elaboration when he/she has reason to believe the hearer understands what the speaker is talking about. Thus the greater the constancy shared between conversants in the expression of key concepts,
the more easily understanding may be assumed and things left unsaid.

Basically these two sets of principles assume that the text has some form of constancy in its underlying conceptual relations and also in the conversational expression of these underlying relations.

Finally, the most widely accepted principle is that receivers almost invariably assume that conversational text will be coherent and hence attempt to interpret the text on the basis of that assumption (de Beaugrande, 1981; Brown & Yule, 1983; Wilson & Sperber, 1981; Sanders, 1983; Hopper, 1983). The problematic issues are how the receivers will cohere the text (Sanders, 1983), what premises and relations they may supply (de Beaugrande, 1981) and what textual cues they will utilize. Finally Hobbs (1979) argues that

a text will strike one as coherent to a degree that varies inversely with the degree of 'difficulty' the inferencing operations have in recognizing some coherence relation (p. 69).

For longer segments of text then it can be argued as a corollary that the more the speaker leaves to be inferred by the receiver in increasingly indirect fashion, the more likely the receiver is to experience difficulty in supplying coherence to the text. Further, the more the speaker fails to provide some constancy in propositional content directly expressed in the text, the more difficulty the re-
ceiver may experience in utilizing the more indirect levels of inferencing to supply coherence.

A Model of Coherence in Conversation

At this point it is wise to combine the above considerations (i.e., local and global coherence procedures, levels of coherence, and types of inferential processes) to form a general model of conversational coherence. The purpose of this model is quite modest; namely, to provide the means to precisely situate and evaluate Hasan's (1984) Cohesive Harmony Index.

The model recognizes the text as the immediate point of communicative contact between two interactants. Without text the interactants are restricted to speculative inferencing about each other based on their shared and individual bodies of social knowledge. Such speculation, often vividly experienced as "cognitive rehearsals" and "imagined encounters", is freewheeling and relatively unanchored. However, when the other interactant supplies communicative text in the form of utterances, inferencing about self and other becomes anchored between the twin foci of the infor-
Figure 1. Model of Coherence in Conversation
mation expressed in the text and the social knowledge brought to the situation by the interactants (either in common or individually). The coherence of the conversation basically resides in each interactant's ability to relate the text systematically and consistently to the social world as understood by that interactant. Note that the judgment of coherence is relative insofar as the conversation may be coherent to the one interactant but not to the other. From the point of view of the discourse analyst such a conversation would not be as coherent as the conversation which is coherent for both interactants in relatively the same fashion.

There are five basic structural components to the model as follows:

1. The conversational text available in the fleeting form of current utterances occurring successively and sequentially. (The text becomes objectively available to the analyst in the form of a recording.)

2. The discourse representation consisting of the direct propositional content of the text which is incrementally constructed by supplying interpretations for cohesive devices in the current utterance and deducing the direct logical implications of the current utterance in conjunction with prior utterances (McLaughlin, 1984).
3. The situation model consisting of pragmatic extensions of the discourse representation in the form of computing the illocutionary force of indirect speech acts, illocutionary sequences, and various relational and episodic significances for the current utterance.

4. The encompassing social world.

5. The shared language code.

Thus four derivative senses of coherence can be stipulated within the model as:

1. the correspondence among individual elements within the text (such as in the analysis of the patterned usage of cohesion by both speakers).

2. the correspondence between the discourse representations of both interactants (Reichman, 1978; van Dijk & Kintsch, 1983)

3. the correspondence between the situation models of both conversants (van Dijk & Kintsch, 1983).

4. the correspondence between the situation model of either conversant and the world at large.

The model has three representational conventions for the expression of variables.

1. The horizontal dimension stretching in each direction from the middle axis represents the continuum of the local vs. global character of a structure.
Note that the discourse representation is usually more local in character than the situation model.

2. The relative size of each component represents the relative load assumed by that component in the process of inferring coherence.

3. The dotted arrows between components represent inference processes. The more dotted the arrows, the greater the inferential effort expended. (3) Absence of an arrow indicates failure to compute coherence.

Thus the model can be used to represent different styles of speaking and interpretation by the interactants. For example, Figure 2 represents two different speakers. Speaker A offers a relatively straightforward and extensive text which is easily interpreted as an extensive discourse representation by speaker B who does not have to supply much additional background information to situate A's comments. Speaker B, on the other hand, offers a relatively begrudging text that shares little of the communicative

(3) The degree of inferential effort could be conceptualized in a number of different ways. Wilson and Sperber's (1981) model of inferencing could be used to assess the number of additional premises which the receiver must supply. Or the formal modes of logical thought (Gibbs, Schnell, Berkowitz, & Goldstein, 1984) could be coded to indicate the rational effort expended by the receiver. Finally, the degree and type of neurophysiological effort could be measured as a response to varying levels of redundancy in the message structure (Pribram & McGuiness, 1975). The diagrammatic convention of the dotted arrows conflates these different approaches in a rather broad fashion.
burden. A's discourse representation may be hard to construct and meager in size. A is forced to shoulder much of the interpretive load in the form of additional pragmatic inferences and thus in Figure 2 there is a notable difference in relative size between A's discourse representation and A's situation model. In this sense the model may be said to be "interactive" and "compensatory" (Stanovich, 1980) insofar as coherence may be achieved by alternative processes which are able to handle variable loads and thus to compensate for each other.

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Insert Figure 2 here

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Thus the most microscopic analysis of coherence focuses on how textual features influence the receiver's interpretive processes in the course of inferring coherence. Prince (1981) regards text as "a set of instructions from a speaker to a hearer on how to construct a particular discourse-model" complete with "discourse entities, attributes, and links between entities" (p. 235). Sanders (1983) argues that a speaker's choice of textual cues can affect the likelihood of the desired interpretation on the part of the receiver. Lack of attention to supplying the necessary textual cues can lead to surprising and/or difficult interpretations by the receiver.
Figure 2. Differences in Interpretive Loads in the Establishment of Coherence in Conversation
This study will utilize such a microscopic analysis of textual cues as evidence of a speaker's sensitivity to his/her interlocutor. Provision of minimal textual cues directing and enabling the hearer's formation of the discourse representation will be considered as evidence of the speaker's inability to share the collaborative burden normal to conversation. Thus high involved speakers, cognizant of and sensitive to their interlocutors, would be expected to provide more textual cues to coherence than low involved speakers.

Textual cues to coherence can span any of the levels of coherence. Goldberg (1983) discusses how discourse particles such as "ya'know" can mark conversational moves. Reichman (1978) lists various textual characteristics marking the shifting of context spaces. Ragan (1983) explicates textual cues serving to align the social identities of interviewer and interviewee. This study, however, will focus on textual cues significant to the determination and coordination of those discourse entities, attributes, and actions which allow for semantic coherence. The more conversants enable each other to identify and develop a joint text-world of shared objects, attributes and actions, the more they are creating and maintaining a joint topic of conversation. Highly involved speakers are expected to show more textual cues to semantic coherence than low in-
The ideational component of semantic coherence is the most referential or content-centered insofar as it represents experience of the world in terms of objects, persons, events, processes, and their various interrelations. The interpersonal component provides the attitudinal coloring distinctive to each speaker's evaluation of the speech situation. Included herein are the roles, statuses and values assigned by each speaker to self and other. (5) The textual component is responsible for the cumulative coordination.

(4) Strong arguments could also be made for high involved speakers providing more textual cues on the pragmatic and relational/episodic levels of coherence as well. Cf. Cegala (1981) for the relation of interaction involvement and facework in conversation.

(5) According to the analysis of levels of coherence presented above, the interpersonal component of semantic coherence would be closely related to local forms of relational/episodic coherence.
Figure 3. Halliday's Conceptualization of Semantic Coherence in Discourse
nation of information across utterances through the systems of theme/rheme and given/new information. (6) Although a strong case can be made for investigating the relation between interaction involvement and each of these components of semantic coherence, it is the ideational component which most directly corresponds to the "content of talk" foregrounded by the concept of topic.

According to Halliday (1980) there are two subcomponents of the ideational component of semantic coherence. The experiential subcomponent divides the world into atomic elements of experience such as objects, persons, events and actions. In addition the experiential subcomponent provides the basic semantic roles for combining these atomic elements to form relations. Thus predicates, arguments and their combinations as propositions are part of the experiential component. The logical component is concerned with the basic logical relations used in natural language to allow for the formation of more complex representations of the world. This component would explore then the use of connectives to signal relations between successive utterances (Halliday & Hasan, 1976; Grimes, 1975). Thus it is the ideational component of semantic coherence which is directly responsible for the local management of content in

(6) Various other scholars have discussed the contribution to coherence by theme/rheme (Brown & Yule, 1983; Danes in Markels, 1981) and given/new information (Goldberg, 1983; Prince, 1981).
talk.

The most basic task to be handled by the experiential component is the direct interpretation of propositional content. In a typical text, reference must be determined for pronouns and demonstratives, the coreference of various nouns must be assessed, and missing arguments must be supplied. Such interpretation then provides referential continuity to the text. Not only must a text enable the hearer to identify the discourse entities, actions and properties being discussed, but the text must also maintain those entities, actions and properties so that the hearer does not become confused (Grimes, 1975). Research by Garnham, Oakhill, and Johnson-Laird (1982) indicates that referential continuity serves as a necessary base for higher order inferential processes in the interpretation of discourse. In their research Garnham et al. used short stories in three different versions:

1. the original versions
2. a version in which the sentence order was randomized
3. a randomized version in which the referential continuity was restored by supplying full noun phrases to replace anaphoric pronouns

Their results showed that the third version with restored referential continuity was more comprehensible than the second version but only for readers who possessed greater
inferential abilities. The totally randomized version was equally incomprehensible to readers with greater or lesser inferential abilities. Garnham et al. concluded that referential continuity seemed to be basic to higher order bridging inferences that deal with other sources of incoherence in the text.

Our results imply that referential coherence is a preeminent factor in the interpretation of discourse; only when it is present can a reader or listener begin to construct a unitary model of the discourse (Garnham et al., 1982, p. 44).

This research finding is quite consonant with Wilson and Sperber's (1981) analysis of inferencing (cited above) wherein the direct propositional interpretation serves as premise to various higher order inferences. Thus the more problematic it becomes to establish the referential continuity of a text, the less coherent the text should seem.

Initially much linguistic research into pronominalization assumed that the interpretation of pronouns and other cohesive devices in discourse was a relatively straightforward affair governed by a set of syntactic rules. Thus when cohesive devices had been interpreted, the resulting chains of reference constituted the coherence of the text.

Recently scholars have started to question whether communicants treat texts as coherent because they recognize the referential continuity of the text. For example, Hobbs (1979) argues:
Successive utterances in coherent discourse refer to the same entities. The common explanation for this is that the discourse is coherent because successive utterances are 'about' the same entities. But this does not seem to stand up (p. 67).

Communicators typically assume the coherence of text and interpret the text in light of that assumption (Hobbs, 1979; Wilson & Sperber, 1981; Morgan, 1979; Brown & Yule, 1983). Rarely do communicators treat an utterance as incoherent until referential continuity has been ascertained. Both Hobbs (1979) and Wilson & Sperber (1981) consider this assumption of coherence to be crucial counterevidence to the straightforward conception of coherence as a product of the computation of referential continuity.

Bolinger (1979) argues that pronominalization is more of a pragmatic inference operating on semantic content than a syntactic operation. In fact he concludes that syntactic systems have not made sense of pronouns in discourse because the open coreference system of English has no structurally stateable restrictions (p. 289). Bily (1977, quoted in Bolinger, 1979, p. 289) found syntactic systems for the interpretation of pronouns in discourse to be "mere ad hoc patchworks". Similarly, Garnham et al. (1982) argue with respect to the interpretation of nouns that mere repetition of a noun does not guarantee that the same entity is being talked about. Thus the establishment of referential continuity is not as straightforward a process as originally conceived. Much inferencing would seem to be required.
Wilson & Sperber (1981) and Hobbs (1979) contend that the direct interpretation of propositional content is heavily dependent on conversational implicature. It is the assumption of coherence which becomes the key premise allowing for the interpretation of pronouns. Not only does the hearer treat it as axiomatic that the speaker has attempted to be coherent, but the speaker knows the hearer will interpret the utterances produced as if they were coherent. Thus the speaker "can leave many entities unmentioned or minimally described" knowing that "the listener can use the coherence assumption to recover entities" (Hobbs, 1979, p. 78). Thus the speaker's responsibility is to provide enough textual cues to allow the listener having assumed coherence to infer a consistent and comprehensive interpretation of the propositional content of the text. As Hobbs (1979) states:

The speaker seeks to have the listener understand him - that is, draw the right inferences and arrive at the correct interpretation of what he says. He seeks to ease the processing load on the listener by structuring his message in a way that will enable finding the right inferences quickly (p. 69).

Hobbs (1979) explicates how conversational implicature would operate in interpreting the ideational component of semantic coherence. He argues that the assumption of coherence allows for the simultaneous specification of both referential continuity and coherence relations between ut-
terances. (7) In Halliday's terms, the listener searches for that interpretation which simultaneously satisfies both the experiential and logical components of semantic coherence. Hobbs (1979) bases this search on a constancy of syntagmatic relations within the text. In effect he is invoking the discourse principles discussed above whereby a constancy of underlying conceptual relations is assumed, and also a constancy of expression is assumed for these relations.

For example, consider the following instructions given by A and B to C:

1. A: "Go down Washington Street."
2. B: "Just follow it three blocks to Adams Street."

Hobbs argues that it is important to recognize that 2) is an elaboration of 1) and not a separate instruction. A pattern evolves from two considerations. First, "go down" in 1) and "follow" in 2) are both directional verbs of motion. Both share the paradigmatic element of "going". Additionally, if "Washington Street" in 1) is read as the antecedent of "it" in 2), then the path of the "going" matches in 1) and 2). Finally, after interpolating "you" as the subject of both imperative verbs, a stable semantic structure emerges from 1) and 2), namely: "you" and "going" bear the syntagmatic relation of actor-action, and

(7) Hobbs' coherence relations characterize the propositional relations between successive utterances as elaboration, parallel, contrast, etc. (Hobbs, 1979).
"going" and "Washington St/it" bear the syntagmatic relation of action-location. Hobbs (1979) spells out in detail how this constancy of relations allows the identification of 2) as an elaboration of 1). A similar analysis of parallel and contrast relations between utterances also relies on constancy of syntagmatic relations across utterances. (8) It would seem reasonable to temper Hobb's conclusion somewhat by allowing that constancy of syntagmatic relations along with the assumption of coherence provides for the recognition of patterns in the experiential component (i.e., assignment of reference), or in the logical component (i.e., coherence relations between utterances), or in both components simultaneously.

In summary then, it has been argued that the coherence of a conversation can be based in varying proportion on text-based or mind-based inferential processes. Nevertheless, both approaches to coherence depend upon establishing the direct propositional content of the conversational text. Such propositional interpretation is accomplished through an indirect inferential process which is dependent upon textual cues provided by the speaker. Specifically, the sort of conversational implicatures which are used to assign direct propositional content to utterances are dependent on a constancy of paradigmatic and syntagmatic re-

(8) For a more detailed technical analysis cf. Hobbs (1979, pp. 73-78).
lations within the text. The more constant a speaker keeps these key relations within the text produced, the more easily the listener can compute the necessary conversational implicatures to assign direct propositional content and the more coherent the text will seem. The less constant the speaker holds the key syntagmatic relations in the text, the more the listener must depend on higher order relational/episodic inferences to validate the assumption of coherence. Thus the speaker has increased the interpretive burden of the listener; ultimately the listener may buckle under too great an interpretive burden and the text will seem quite incoherent. Highly involved speakers, who should be sensitive to the interpretive demands they are placing on their interlocutors, should provide for a greater constancy of syntagmatic relations in their talk than low involved speakers.

The Cohesive Harmony Index

This study utilized Hasan's (1984) Cohesive Harmony Index as a measure of the semantic coherence attributable to a stable paradigmatic and syntagmatic role structure within the conversational text produced by high involved and low involved speakers. In a complex multi-stage coding procedure, all grammatical cohesive devices (reference, substitution, and ellipsis) were interpreted so that paradigmatic
chains of identity and similarity could be isolated across discourse entities, actions and properties in the text. All tokens within these chains were designated as relevant tokens and were then coded for their syntagmatic role relations with other relevant tokens in the chains. If two chains bore two or more occurrences of the same syntagmatic role relations, the chains were said to interact; i.e., there was a stable recurring syntagmatic role relation between the chains in the text. All relevant tokens which occurred in chain interactions were designated as central tokens. The Cohesive Harmony Index was then computed as the ratio of central tokens to relevant tokens. The greater the stability and constancy of the syntagmatic role relations within the text, the higher the Cohesive Harmony Index.

In terms of the model of coherence presented in Figure 1, the Cohesive Harmony Index measures the correspondence among individual elements in the text. If a text has a low CHI, the listener will have a difficult time constructing an adequate discourse representation and may have to compensate by invoking higher order inferences to figure out what the speaker must be saying. With too low a CHI the listener may not be able to compensate enough and the text will seem incoherent. On the other hand, a high CHI will indicate a text that is easily interpreted on the proposi-
tional level and that serves as a stable base for a wide range of inference processes which give conversation its semantic and pragmatic richness. A text with too high a CHI, however, probably exhibits too much explicit redundancy and may be avoiding the higher order inference processes which create a sense of movement within the text. In this sense the delicate balance of what is said vs. what is left unsaid has been tipped in favor of saying too much. Too much reliance on text-based coherence may indicate an inability to deal with mind-based coherence strategies.

In recent research the Cohesive Harmony Index has differentiated coherence and incoherence in both written and spoken text. Pappas (1981), and Rentel and King (1983) used the Cohesive Harmony Index to investigate the development of coherence in texts produced by children in grades one to four. Hasan (1984) reports the results of an informal validation study of the CHI. Texts that were consistently judged incoherent all had a CHI below the .50 level. However, there has been little investigation of the significance of differences between higher values of the CHI, although information theory would tend to predict that high values of the CHI represent excessive redundancy that adversely affects the sense of movement within the text.

Thus it was hypothesized that the Cohesive Harmony Index for high involved speakers should be significantly higher
than the Cohesive Harmony Index for low involved speakers. It was felt that low involved speakers would have problems creating coherent text because they might not even be sensitive to the processing requirements of their conversational partner. In addition, they might not be sufficiently attentive to the ongoing conversation to be able to sustain a stable paradigmatic and syntagmatic structure.

In Chapter Two, the coding procedures for the Cohesive Harmony Index are explained in detail, followed by detailed working hypotheses. Chapter Three then explains the methods and procedures for the experimental study.
CHAPTER TWO

THE COHESIVE HARMONY INDEX

In Chapter One it was argued that a constancy of paradigmatic and syntagmatic relations within a text is essentially related to the coherence of the text. The purpose of this chapter is to show in detail how the constancy of paradigmatic and syntagmatic relations within a text is measured by the coding procedures of Hasan's (1984) Cohesive Harmony Index. Additional related discourse measures produced by these coding procedures will also be explained. Finally the explicit working hypotheses will be stated for the experimental study of the coherence of conversation produced by high involved and low involved communicators.

Prior to the detailed consideration of the actual coding procedures it might be helpful to present an analogy to the underlying conceptualization of the CHI. Hasan (1984) discusses how discourse has semantic threads of continuing reference and association running through the discourse. But instead of arguing that coherence resides in one semantic thread alone, Hasan argues that coherence results from a weave of both paradigmatic and syntagmatic threads. Thus
the coherence of discourse increases as the semantic fabric is more tightly woven 1) by increasing the paradigmatic warp (number of threads of continuing reference running in a linear fashion through the discourse) and 2) by increasing the syntagmatic woof or crossweave (the number of regular semantic relations tying together the paradigmatic threads). The general objective of the coding procedures is to represent the tightness of the semantic fabric as a ratio running from 0 to 1. Following the analogy of woven fabric, 1 might represent a densely woven fabric such as linen whereas 0 would represent a few randomly crossed threads that one would hesitate to even call a fabric. The basic hypothesis of this study is that the semantic fabric of conversation by high involved speakers should be more densely woven than the semantic fabric of conversation by low involved speakers.

Coding Procedures for the Cohesive Harmony Index

1. Coding T-units. The first step in computing the Cohesive Harmony Index (henceforth designated CHI) for conversational text produced by two speakers is to segment the transcript of the conversation into "minimal terminable units" or "T-units" (Hunt, 1964, 1965; O'Donnell, Griffin & Norris, 1967). The intent of this step is to isolate the shortest portions of utterances which can stand alone as a
well-formed expression of a complete thought. In practice the T-unit is equivalent to an independent clause plus three types of accompanying linguistic strings:

1. subordinate dependent clauses and rankshift clauses,
2. speaker identifying clauses,
3. certain linguistic strings associated with adjacency pairs (for example: uh huh and nn nn as the positive and negative expression of polarity respectively in second pair parts).

Whereas the coding procedures for T-units in written discourse are one page in length, the coding procedures developed for T-units in conversation were fifteen pages in length. The added complexity of the conversational procedures stems from the following two sources:

1. procedures were needed to weed out semantically extraneous material such as verbal fillers, unnecessary qualifiers, passes of turns, unmotivated repetitions and false starts.
2. procedures were needed to segment utterances which were started by one speaker and completed by the other speaker or both speakers simultaneously.

2. Coding Grammatical Cohesive Devices. In this stage of coding all the grammatical cohesive devices in the text are identified and interpreted. Halliday and Hasan (1976) served as the basis for analysis of such cohesive devices
with an added provision that cohesive devices within T-units were coded as well (Pappas, 1981). In *Cohesion in English*, Halliday and Hasan (1976) analyze the different types of cohesive devices in English which may be used to tie together portions of a text. When a speaker uses an endophoric cohesive device the interpretation of that device is dependent upon some other portion of the text. In conversation most of the cohesive devices are anaphoric (i.e., referring back in the text to some antecedent source); occasionally cataphoric devices (pointing forward to a presupposed source yet to come in the text) are encountered. In English there are three categories of grammatical cohesive devices:

1. Reference devices include pronoun forms, the definite article, demonstratives, and comparative forms (cf. Halliday and Hasan, 1976, pp. 31-87). These devices operate on a semantic level and preserve continuity of reference. Generally they serve to link noun structures within the text. In extended reference the device may refer to a whole T-unit or utterance.

2. Substitution operates to relate wordings rather than meaning (cf. Halliday and Hasan, 1976, pp. 88-141). In substitution a counter or marker word is used instead of repeating a word, phrase or clause. Nomi-
nal substitution often involves the forms one, ones, or same as in the following example.

A: I have a foreign TA.

B: I have one too.

Verbal substitution, which occurs infrequently in American conversation, uses the generic verb do in place of a more specific verb. Clausal substitution uses the form do so to substitute for a whole clause.

A: I have to register soon.

B: You mean you haven't done so yet?

3. Ellipsis can be treated as a subcase of substitution wherein the marker is omitted (cf. Halliday and Hasan, 1976, pp. 142-225). In other words ellipsis allows something to remain unsaid because it was stated previously and is to be understood again. As in substitution, it is possible to elide nominal, verbal, and clausal groups. In conversation adjacency pairs make extensive use of ellipsis in the second pair part. Often in answer to a Yes-No question, the polarity element is the only explicitly expressed element of the answer. The remainder of the answer is elided. Thus in
A: Do you like your Communication 105 section?

B: Yeah a lot.

B's answer is interpreted as

B: Yeah I like my Communication 105 section a lot.

After each grammatical cohesive device in the transcript is identified and coded as either reference, substitution, or ellipsis, the presupposed source of interpretation is located. If the presupposed source is within the same speaker's current T-unit, the cohesive tie is coded NW (i.e., noninteractive, within the same T-unit). If the presupposed source is within a prior T-unit of the same speaker, the cohesive tie is coded NB (i.e., noninteractive, between T-units). If the presupposed source is an utterance of the other speaker, the cohesive tie is coded I (i.e., interactive). Finally the specific interpretation of the cohesive device is inserted into the text in place of the device. If the interpretation is ambiguous, the alternative interpretations are recorded together as follows:

?Jill

John really likes ?Mary.

In the event that subsequent discourse disambiguated the interpretation, the rejected alternative is crossed out.

A number of grammatical cohesive devices such as pronouns and demonstratives can be used to refer endophorical-
ly (within the text) or exophorically (to the speech situation or other situations). At this stage of coding, exophoric references are interpreted when possible. The predominant portion of such exophoric references were the first and second person pronouns which were interpreted using the person's subject ID number in the experiment.

The following text presents examples of the major grammatical cohesive devices of reference, extended reference, substitution, and ellipsis plus exophoric reference to speaker and hearer. The code on the left identifies speaker number and the T-unit number.

**Example Text #1**

S11: 041 I had a lousy Communication 105 midterm last week.
S11: 042 How did you do on it?
S12: 043 Okay
S12: 044 In fact I had a pretty good one.
S12: 045 That doesn't happen too often.

The interpreted text would then appear as follows with each interpretation underlined and the codes for each cohesive tie listed in parentheses after the interpreted tie.

S11: 041 S11 had a lousy Communication-105 midterm last week.
S11: 042 How did S12 do on Communication-105 midterm (Reference/NB) ?
S12: 043 S12 did okay on Communication-105 midterm (Ellipsis/I)
S12: 044 In fact S12 had a pretty good Communication-105 midterm (Substitution/NB)
S12: 045 S12 have a pretty good midterm (Reference-extended/NB) does not happen too often

3. **Forming Identity Chains and Similarity Chains.** The next step is to trace all the paradigmatic chains of recurring reference and association which run through the conversational text. These chains are of two types: identity chains and similarity chains (Hasan, 1984). Identity chains are based on the semantic bond of co-referentiality whereby all tokens in the chain refer to the same specific referent. Normally, co-referentiality is achieved through the use of pronouns, the definite article, demonstratives and comparatives. Similarity chains are based on the semantic bonds of co-classification and co-extension. In co-classification there are two or more different ultimate referents which are nevertheless members of the same class. For example, S11's midterm and S12's midterm are tied together by the bond of co-classification. Co-extension reflects language-wide lexical ties achieved through reitera-
tion, synonymy, antonymy, hyponymy and meronymy. Thus the tokens lousy, okay, and good form a similarity chain expressing judgments of value.

Halliday and Hasan (1976) also discuss the lexically cohesive device of collocation which is roughly the same as Sacks' (1972) membership categorization device. Hasan (1984) deleted collocation from the coding procedures for the CHI because it was too vague to obtain adequate coding reliability and because most cases of collocation can be subsumed under the remaining five lexically cohesive devices of reiteration, synonymy, antonymy, hyponymy and meronymy.

In the lexically cohesive device of reiteration the same lexical item (or a morphologically related form) is repeated in the text. Thus there is a stability in the usage of the same lexical meaning. In the following example,

A: What do you propose we do?
B: My proposal is that we analyze the problem first. propose and proposal would constitute a reiterative lexical tie.

Synonymy occurs when lexical items have roughly the same meaning, although it is not the precise equality of meaning as found in reiteration. Instructor-professor and college-university are examples of synonymy. Sometimes one lexical item may be synonymous with one particular meaning of a po-
lysemous lexical item. For example, course and class are synonymous unless class is used to mean the actual teaching episode as in "I've got to go to class".

The third lexically cohesive device is antonymy wherein the lexical items exhibit an opposition or contrast in meaning. The pairs of like-hate and good-bad demonstrate antonymy. Notice that antonymy functions as a lexical linkage only because the opposition presupposes a common semantic feature which serves as the basic dimension on which the opposition is played out. In the case of like-hate and good-bad the shared semantic feature is that of evaluation.

Hyponymy reflects a relationship in which one lexical item is a member of the other lexical item. Thus section-course and parent-relative are hyponyms. Co-hyponyms are two lexical items which are related insofar as both are members of the same overarching lexical set. Father-mother and motorcycle-car illustrate this relation. Sometimes, a lexical tie can be classified as either weak antonymy or co-hyponymy as in the case of father-mother. The crucial point is not whether the tie is coded as antonymy or co-hyponymy but that the tie of lexical cohesion is recognized and the tokens are included in the same similarity chain.

The final lexically cohesive device is meronymy which expresses part-whole relations such as door-house and face-mouth.
At this point in the coding procedures the verb be is coded into its three forms: attributive, existential, and equative (Halliday, 1967a) and the sense of other general verbs is more precisely indicated. Thus have/possess would be differentiated from have/must. All inflected endings are also deleted leaving only the stem of the word. Also, all function words (or closed word classes) such as conjunctions, articles, prepositions, and negative particles are deleted from the text. Only the remaining content words (open word classes) may be incorporated into chains.

Identity chains are then formed from those nouns which are bound together by the semantic bond of co-referentiality. Nouns can also enter into identity chains through the following text-bound instantial lexical relations:

1. equivalence: "My TA is Sharon's brother."
2. naming: "My TA is called Chuck."
3. semblance: "My TA is like a big shaggy dog."

(Hasan, 1984, p. 202)

Two identity chains can merge to form a new identity chain, or conversely, an identity chain can split to form two separate identity chains. Hasan (1984) discusses this phenomenon in detail as chain conjunction and disjunction.

Similarity chains may consist of any or all of the four open word classes remaining in the text, namely, nouns, verbs, adjectives, and adverbs. These tokens enter a simi-
larity chain through the bonds of co-classification or co-extension. Normally the shared semantic feature which characterizes the similarity chain is fairly obvious. However, if hyponymy and meronymy are applied too liberally, similarity chains may become too inclusive and thus no longer discerning. For example, one lexical item may be a part of another lexical item which, in turn, is a part of a third item and so forth. The resultant chain blurs essential distinctions within the text. Thus, for this study, two rules of thumb were developed for the formation of similarity chains.

1. Hyponymy and meronymy were applied in the most direct fashion possible. Removed or distant relations of these two types were ignored. For example, a professor was not considered part of a university.

2. Similarity chains were restricted to no more than three levels of association with two levels being definitely preferred. If more than three levels of association were encountered, the coder split the chain in a manner reflecting the relative emphasis of the text. For example, a similarity chain of TA-professor-teacher-personnel-employee might be split into two similarity chains of TA-professor-teacher and personnel-employee.
One additional feature was added to Hasan's (1984) procedures for forming identity and similarity chains. Since a noun that identifies a particular ultimate referent does not lose its general lexical associations, it was decided that nouns might belong simultaneously to an identity chain and a similarity chain. This feature allowed for greater validity in coding the conversational episode whereby one conversant's talk about his/her father occasions talk by the other conversant about their father. Thus the following example

A: My father is a butcher.
B: Well my father is an insurance salesman but my neighbor is a butcher.

would be coded as having four identity chains and two similarity chains:

1. IC1: father-butcher
2. IC2: my(B)-my(B)
3. IC3: father-salesman
4. IC4: neighbor-butcher
5. SC1: father-father
6. SC2: butcher-salesman-butcher

Notice that there is a distinctive intertwining of the chains insofar as the nouns are concerned. This becomes apparent if the coding of the chains for the nouns is mapped out for each utterance:
A: father(IC1/SC1)   butcher(IC1/SC2)
B: B(IC2) father(IC3/SC1)   salesman(IC3/SC2)
   B(IC2) neighbor(IC4)   butcher(IC4/SC2)

The text at the end of this stage of coding is now called the lexically rendered text. The tokens belonging to chains are termed relevant tokens and are printed in bold type. The remaining tokens, which do not belong to chains, are termed peripheral tokens.

Example Text #2: Lexically Rendered Version
S11: 041 S11 have/possess lousy Communication-105 midterm
     last week
S11: 042 how S12 do/general Communication-105 midterm
S12: 043 S12 do/general okay Communication-105 midterm
S12: 044 fact S12 have/possess pretty good Communication-105 midterm
S12: 045 S12 have/possess pretty good midterm happen too often

Rearranged in a different format to foreground the different identity and similarity chains, the text appears as follows:
Insert Figure 4 here
<table>
<thead>
<tr>
<th>I1</th>
<th>I2</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>S5</th>
</tr>
</thead>
<tbody>
<tr>
<td>S11:</td>
<td>041</td>
<td>Communication-105</td>
<td>have/possess</td>
<td>lousy</td>
<td>midterm</td>
<td></td>
</tr>
<tr>
<td>S11:</td>
<td>042</td>
<td>S12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S12:</td>
<td>043</td>
<td>S12</td>
<td>Communication-105</td>
<td>do/gen</td>
<td>how</td>
<td>midterm</td>
</tr>
<tr>
<td>S12:</td>
<td>044</td>
<td>S12</td>
<td>Communication-105</td>
<td>do/gen</td>
<td>okay</td>
<td>midterm</td>
</tr>
<tr>
<td>S12:</td>
<td>045</td>
<td>S12</td>
<td>have/possess</td>
<td></td>
<td>good</td>
<td>midterm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>have/possess</td>
<td></td>
<td>good</td>
<td>midterm</td>
</tr>
</tbody>
</table>

Figure 4. Identity and Similarity Chains in Example Text 2
4. **Chain Interaction.** As can be seen quite clearly in the preceding figure, identity chains and similarity chains form the paradigmatic warp or lengthwise linear threads strung on the loom of discourse. The last stage of coding is designed to isolate the syntagmatic crossweave binding these threads together to form a fabric. Hasan (1984) identifies this syntagmatic crossweave as occurring when "two or more members of a chain stand in an identical functional relation to two or more members of another chain" (p. 212). The specific functional relations to be coded are derived mostly from Halliday's (1967a, 1967b, 1968) analysis of transitivity relations with a few supplementary relations derived from other systemic grammars and case grammars (Cook, 1979; Hudson, 1971; Muir, 1972). Examples of such functional relations are actor-action, action-goal, action-location, attribuand-attribute, intensifier-intensified, etc. The coding system employed in this study utilized 39 such functional categories.

Considering similarity chains S1 and S4 in the text above, it can be seen that have/possess and midterm stand in the identical relation of action-goal in utterances 041, 044, and 045. Similarly, pretty and good stand in the same relation of intensifier-intensified in utterances 044 and 045. Once the condition of chain interaction is met, as in these cases, the tokens that interact in the two chains are
designated as central tokens. Nouns which belong to both an identity chain and a similarity chain have a double opportunity to become a central token. There is no added differentiation if a noun should become a central token twice by participating in two separate chain interactions. Such a noun would still be counted as one central token.

5. Calculating the Cohesive Harmony Index.

As a result of the coding procedures described above, each token in the lexically rendered text has been coded either as a peripheral token or a relevant token (i.e., belonging to a chain). A subset of the relevant tokens have been additionally designated as central tokens (i.e., participating in a chain interaction). Thus central tokens are those tokens which reflect the constancy of both paradigmatic and syntagmatic relations within a text.

In accord with the rationale developed in Chapter One, it is believed that incoherent texts manifesting low cohesive harmony, i.e., unstable paradigmatic and syntagmatic relations, should contain a low number of central tokens; coherent texts with high cohesive harmony, i.e., stable paradigmatic and syntagmatic relations, should contain a high number of central tokens. Hasan (1984) divided the number of central tokens in a lexically rendered text by the total number of tokens in the lexically rendered text in order to create the CHI as a measure ranging from 0 to
1. In her analysis of approximately 80 texts she found that every text considered to be coherent had at least a value of .50 for its CHI. Rentel and King (1983) and Pappas (1981), however, computed the CHI as the number of central tokens divided by the number of relevant tokens. Rentel (personal communication) indicated that Hasan had originally defined the CHI as central tokens/relevant tokens but then had changed the formula prior to publication of Hasan (1984). The difference between the denominators of the two versions of the CHI resides in the inclusion of peripheral tokens by Hasan (1984) who argues that the ratio of peripheral tokens to central tokens also discriminates between coherent and incoherent texts. In the case of the exemplar text, the CHI (Rentel's formula) is a rather unusual 1.00, indicating an extremely coherent text. According to Hasan's formula though, the CHI is only 0.79.

A supplementary textual measure, the Cohesive Density Index (CDI), was computed by Pappas (1981) as the ratio of relevant tokens to total tokens in the lexically rendered text. The CDI provides a measure of how much additional information there is in the text beyond the semantic gist represented as the relevant tokens. In the exemplar text the CDI is .79 which is not exceptionally high. In effect then the exemplar text is a very coherent and tightly delimited information unit with some additional peripheral
information. Pappas (1981) found that in general the CHI and CDI varied in tandem, although there were some points at which the divergence of the measures seemed to be of significance.

At present it seems most accurate to conclude that the exact significance of the several ratios which can be computed among peripheral, relevant, central, and total tokens of a lexically rendered text is not precisely known. The statistical procedures utilized in this study to cope with this problem will be discussed later in Chapter Four.

In discourse there is always the possibility of ambiguity, usually as a result of difficulty in determining the precise antecedent of an anaphoric pronoun or demonstrative. In most cases the ambiguity is resolved rather quickly by added syntactic, semantic and pragmatic constraints in the following utterances. When such disambiguation occurs, the tokens are coded as if they had never been ambiguous in the first place. In cases of unresolved ambiguity, each of the tokens of the shortest alternative interpretation is replaced by the symbol *ambig* which is counted as a relevant token. *Ambig*, however, cannot become a central token. Nor can it be used as the basis for a chain interaction. Thus other relevant tokens in the utterance may fail to become central tokens as well. Such an approach to unresolved ambiguity allows the discourse to
stipulate a variable penalty for the lack of resolution depending upon the centrality of the ambiguity in the utterance. (9)

6. Coding Interactive, Noninteractive and Initial Tokens. The CHI developed thus far is a measure of coherence for the whole conversational text. In other words, it does not distinguish whether the text was produced by one speaker alone or by two speakers. But for the purposes of investigating the verbal manifestations of interaction involvement in conversation it would be helpful to partial out the contribution made to the total coherence of the conversation by each conversant. The easiest way to do this would be to break down the total CHI(10) into two parts; namely, the ratio of speaker A's central tokens to the total number of relevant tokens in the lexically rendered text of the conversation, and the corresponding ratio for speaker B. Thus these two individual ratios would sum to form the CHI for the whole conversation.

(9) Rentel and King (1983) adopted an alternative strategy for coding unresolved ambiguity by deducting a fixed penalty of one central token for each case of unresolved ambiguity. Hasan (1984) computed two separate CHI scores for the whole text thereby reflecting one possible reading of the ambiguity in each score. Such a strategy was rejected as unfeasible in extended conversational texts where multiple cases of unresolved ambiguity are possible.

(10) In this section the CHI will be computed using Rentel's formula rather than Hasan's. However the logic behind the development of an interactive component of the CHI applies equally well to both versions of the CHI.
\[ \text{CHI(Conversation)} = \text{CHI(Speaker A)} + \text{CHI(Speaker B)} \]

However there is a fundamental defect in such an approach. It would be possible for speaker A to form a quite coherent text by tying his/her utterances back to only his/her own prior utterances. Sacks (1971; cited in Coulthard, 1977) calls such a conversational strategy "skip-connecting". It is a prime example of an individual either unable or unwilling to become involved in the other's comments and thus to develop a joint topic of conversation. If the other conversant also engages in skip-connecting, the conversation might be described as two different topics passing in the night.

The remedy for this defect involves breaking down the CHI into more finely discriminated constituents. Basically this means differentiating each speaker's CHI into the noninteractive coherence achieved by relating back to that speaker's own prior utterances and the interactive coherence achieved by relating back to the other's prior utterances.

The basis for such a differentiation becomes apparent when an interactive conversation and a skip-connected conversation are compared with respect to identity and similarity chains. In the following figure the tokens used by speaker A and speaker B are designated A and B respectively. When the identity and similarity chains in the two
types of conversation are listed in terms of A and B tokens, the difference between the skip-connected conversation and the interactive conversation becomes quite apparent.

---

Insert Figure 5 here

---
Skip-connected Conversation

<table>
<thead>
<tr>
<th>I1</th>
<th>I2</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
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</tbody>
</table>

Interactive Conversation

<table>
<thead>
<tr>
<th>I1</th>
<th>I2</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
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</thead>
<tbody>
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<td>A</td>
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<td>A</td>
<td>A</td>
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<td>A</td>
<td>B</td>
<td>B</td>
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</tr>
</tbody>
</table>

Figure 5: Chain Composition in Skip-connected and Interactive Conversation
In the skip-connected conversation the chains generally belong to one speaker, whereas in the interactive conversation there is an alternating pattern of usage by both speakers.

The following simple algorithm is designed to reflect the distinctive difference between skip-connected and interactive conversations.

If the immediately preceding token in a chain is used by the other speaker, the current token is designated as interactive; otherwise the current token is designated as noninteractive (i.e., if the immediately preceding token in the chain was used by the same speaker). The initial token in each chain is neither interactive nor noninteractive and hence is coded as initial.

The CHI for Speaker A now equals the sum of three ratios:

\[
\frac{\text{interactive central tokens for } A}{\text{relevant tokens for conversation}}
\]

\[
\frac{\text{noninteractive central tokens for } A}{\text{relevant tokens for conversation}}
\]

\[
\frac{\text{initial central tokens for } A}{\text{relevant tokens for conversation}}
\]

The first ratio will be designated as the Interactive CHI for a speaker and the second ratio will be designated as the Noninteractive CHI for a speaker. The CHI for the total conversation is now equal to the sum of six ratios, i.e., three ratios for each speaker. Thus these ratios are said to be additive. Similarly, the Interactive CHI for the whole conversation equals the sum of the additive In-
teractive CHIs for both speakers. The Noninteractive CHI for the conversation equals the sum of the additive Noninteractive CHIs for both speakers. The Interactive and Noninteractive CHIs for the conversation reflect how much the conversation is devoted to shared topics or to topics individual to each speaker. Nonadditive versions of the same ratios could be computed by using relevant tokens for each speaker as the denominator, instead of relevant tokens for the conversation. Then the ratios for both speakers in a conversation would not add up to form the ratio for the total conversation.

--------------------
Insert Table 1 here
--------------------

Such ratios are said to be nonadditive.

Table 1 illustrates the differences between additive and nonadditive CHI measures for a hypothetical conversation which has been coded for all the necessary token counts (listed in the initial portion of the table). Notice that for the additive measures the values for both speakers sum to equal the value for the conversation. This feature does not hold for the nonadditive measures which reflect the cohesive harmony within each speaker's text with no regard to the proportional contribution made by that speaker to the whole conversation. The additive meas-
Table 1
Additive and Nonadditive Cohesive Harmony Measures for Hypothetical Cohesion Data

<table>
<thead>
<tr>
<th>Unit of Measurement</th>
<th>Frequency Counts of Coded Token Categories</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IC</td>
<td>NC</td>
</tr>
<tr>
<td>Speaker A</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>Speaker B</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>Total Conversation</td>
<td>40</td>
<td>40</td>
</tr>
</tbody>
</table>

*IC = Interactive Central; NC = Noninteractive Central; C = Central; R = Relevant; P = Peripheral

<table>
<thead>
<tr>
<th>Unit of Measurement</th>
<th>Additive Versions of CHI Measures</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CHIb</td>
<td>CDI</td>
</tr>
<tr>
<td>Speaker A</td>
<td>.500</td>
<td>.429</td>
</tr>
<tr>
<td>Speaker B</td>
<td>.300</td>
<td>.285</td>
</tr>
<tr>
<td>Total Conversation</td>
<td>.800</td>
<td>.714</td>
</tr>
</tbody>
</table>

*CHI = Cohesive Harmony Index (C/Total R)
CDI = Cohesive Density Index (R/Total Tokens for Conv)
ICH = Interactive CHI (IC/Total R)
NCHI = Noninteractive CHI (NC/Total R)

<table>
<thead>
<tr>
<th>Unit of Measurement</th>
<th>Nonadditive Versions of CHI Measures</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CHIC</td>
<td>CDI</td>
</tr>
<tr>
<td>Speaker A</td>
<td>.833</td>
<td>.750</td>
</tr>
<tr>
<td>Speaker B</td>
<td>.750</td>
<td>.667</td>
</tr>
<tr>
<td>Total Conversation</td>
<td>.800</td>
<td>.714</td>
</tr>
</tbody>
</table>

Same formulas as above except denominator is Total Tokens for speaker or R for speaker
ures, on the other hand, reflect how the speaker's cohesive harmony relates to the conversation at large.

7. **Summary of textual variables.** Given the completion of the coding procedures specified above, there are a number of textual variables which can be computed for a dyadic conversation. The first set of such variables are those that pertain to the conversation as a whole.

1. **Cohesive Harmony Index for the whole conversation**
   (There are two computational variants: Hasan's version computed as number of central tokens/total number of tokens; Rentel's version computed as number of central tokens/number of relevant tokens)

2. **Cohesive Density Index for the whole conversation**
   (computed as number of relevant tokens/total number of tokens)

3. **Interactive Cohesive Harmony Index for the whole conversation**
   (computed as number of interactive central tokens/number of relevant tokens)

4. **Noninteractive Cohesive Harmony Index for the whole conversation**
   (computed as number of noninteractive central tokens/number of relevant tokens)

5. **Total number of tokens in the lexically rendered text of the whole conversation**

6. **Total number of T-units for the whole conversation**
7. Number of tokens per T-unit for the whole conversation (computed as the total number of tokens/total number of T-units)

A second subsidiary set of textual variables are those pertaining to the conversational text of each individual speaker.

8. Cohesive Harmony Index for each speaker (There are four computational variants: the additive and nonadditive versions of Hasan's CHI, and the additive and nonadditive versions of Rentel's CHI.)

9. Cohesive Density Index for each speaker (both additive and nonadditive versions)

10. Interactive Cohesive Harmony Index (both additive and nonadditive versions)

11. Noninteractive Cohesive Harmony Index (both additive and nonadditive versions)

12. Total number of tokens in lexically rendered text of each speaker

13. Total number of T-units for each speaker

14. Number of tokens per T-unit for each speaker.
Hypotheses

The basic experimental design creates 30 same sex dyads such that there are ten dyads in each of three conversational combinations of high and low involved subjects: 1) high-high, 2) high-low, and 3) low-low. The following hypotheses concern the whole conversational text produced by each dyad, rather than the individual textual contributions of each speaker. The emphasis is on differentiating the coherence of the three types of dyads rather than on differentiating the coherence of individual speakers. This emphasis is in accord with the recent theoretical developments which posit communicative competence and coherence as attributes of interactions rather than individuals. Thus the textual characteristics of individual speakers will be examined only in order to support the primary analysis of differences among the types of dyads.

The hypotheses are as follows:

1. The Cohesive Harmony Index should show a significant main effect for type of dyad such that CI(high-high) > CI(high-low) > CI(low-low).

2. The Cohesive Density Index should show a significant main effect for type of dyad such that CDI(high-high) > CDI(high-low) > CDI(low-low). This would be in accord with Pappas (1981) who found that generally CHI and CDI varied in tandem.
3. The Interactive Cohesive Harmony Index should show a significant main effect for type of dyad such that $\text{ICHI}($high-high$) > \text{ICHI}($high-low$) > \text{ICHI}($low-low$)$.

4. The Noninteractive Cohesive Harmony Index should show a significant main effect for type of dyad such that $\text{NCHI}($high-high$) > \text{NCHI}($high-low$) > \text{NCHI}($low-low$)$.

5. There will be no significant main effect by type of dyad for the total number of tokens in a conversation. A low involved person may avoid interaction by monopolizing the floor or by saying very little.

6. There will be no significant main effect by type of dyad for the total number of T-units.

7. Syntactic complexity, as measured by the mean number of tokens per T-unit, should show a significant main effect for type of dyad such that $\text{tokens/T-unit}($high-high$) > \text{tokens/T-unit}($high-low$) > \text{tokens/T-unit}($low-low$)$.

8. There will be no significant main effect by sex on any of the dependent variables.

9. There will be no significant interaction effect between type of dyad and sex for any of the dependent variables.
CHAPTER THREE

METHODS AND PROCEDURES

Data Collection

Phase I. As part of a larger study, the IIS was administered to 433 undergraduate students (210 males, 223 females) enrolled in the basic public speaking course, Communication 105, at The Ohio State University. The students enrolled in this course generally represent a wide variety of backgrounds and majors because the course fulfills a basic Liberal Arts requirement.

The IIS, along with several other self-report measures, was administered in 18 individual sections by the graduate teaching associates on or about September 28, 1982. The subjects were informed that they might subsequently be requested to participate in Phase II of the experiment for which they would be compensated $3.00. Before distribution of the self-report measures each subject was asked to fill

(11) The larger study was directed by Dr. Donald Cegala under a Small Research Grant from the Graduate School of The Ohio State University.
out a schedule card indicating times when they were generally free. This card was to be used for scheduling those subjects requested to participate in Phase II.

Subjects marked their responses to the IIS on computer scan sheets which were subsequently checked for problems such as extraneous markings, misplaced answers, etc. Missing data were corrected by assigning the midpoint of the scale as the answer. Thus the data set for the IIS had no missing data.

In accord with the procedures used in Cegala (1981) and Cegala et al. (1982), a principal components analysis with oblique rotation was run on the responses to the IIS. Factor scores were computed for each subject on each of the three factors of the IIS using a least squares method. The following reliability estimates for each of the three factors were obtained using coefficient alpha: responsiveness = .90, perceptiveness = .84, and attentiveness = .81 (Cegala, 1984).

The experimental design for the larger study called for 60 high involved subjects and 60 low involved subjects. To this end a pool of potential subjects was created. However, high and low involvement was defined not in terms of the simple sum score on the IIS but in terms of involvement type as suggested in Cegala et al. (1982). If the three factor scores for any subject are coded as falling above or
below the mean on their respective factor, there are eight possible permutations which result. Insofar as four permutations are mirror images of the other four, the analysis yields four involvement types with both high and low forms as shown in Table 2.

Insert Table 2 Here

Only types 1, 2, and 3 were included in the subject pool. These three involvement types share the common feature that the subject's factor score for responsiveness correlates directly with the subject's overall interaction involvement. Thus a low involved subject will have a responsiveness score below the mean and a high involved subject will have a responsiveness score above the mean. The responsiveness scores of type 4 subjects are exactly the opposite. Given that the responsiveness factor accounts for the most variance in the IIS and that type 4 subjects occur relatively infrequently, it was decided to exclude type 4 respondents from the potential subject pool.

Three waves of subjects were needed to fill the potential subject pool. Selected in the first wave were subjects whose factor scores were approximately ± .5 standard deviations away from the mean on all three factors. The
Table 2
Involvement Types

<table>
<thead>
<tr>
<th>Involvement Type</th>
<th>Involvement Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>R(^a) P A</td>
</tr>
<tr>
<td>Type 1</td>
<td>+(^b) + +</td>
</tr>
<tr>
<td>Type 2</td>
<td>+ - +</td>
</tr>
<tr>
<td>Type 3</td>
<td>+ + -</td>
</tr>
<tr>
<td>Type 4</td>
<td>- + +</td>
</tr>
</tbody>
</table>

\(^a\) R = Responsiveness, P = Perceptiveness, A = Attentiveness

\(^b\) + = scored above the mean; - = scored below the mean
second wave included subjects for whom one factor score was only $+0.4$ standard deviations away from the mean. Subjects in the third wave had factor scores on responsiveness and one other factor in excess of $+0.5$ standard deviations from the mean and a score on the final factor of between $0.2$ and $0.4$ standard deviations above or below the mean. The resulting subject pool included 190 people of whom 122 eventually participated in Phase II. Using the above procedures, the IIS scores of these 122 subjects resulted in a range of responsiveness scores from $-4.160$ to $1.980$ with 7 scores less than $+0.5$ standard deviations (i.e., $0.4$); a range of perceptiveness scores from $-2.550$ to $2.840$ with 9 scores less than $+0.5$ standard deviations (i.e., $0.4$); and a range of attentiveness scores from $-2.750$ to $2.070$ with 30 scores less than $+0.5$ standard deviations.

**Phase II.** In Phase II 120 subjects were paired to form sixty (12) conversational dyads of the same sex. These dyads consisted of either two high involved subjects, two low involved subjects, or one high and one low involved subject. Thus the experiment had a $3 \times 2$ design as illustrated in Table 3

(12) Eventually only thirty of these dyads were used in this study. The number of conversations in each cell of the design was halved through random selection.
TABLE 3

Classification of Phase II Conversations

<table>
<thead>
<tr>
<th>Dyadtype</th>
<th>Sex</th>
<th>Matched</th>
<th>Matched</th>
<th>Mixed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>High</td>
<td>Low</td>
<td>High-Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td>n = 10</td>
<td>n = 10</td>
<td>n = 10</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>n = 10</td>
<td>n = 10</td>
<td>n = 10</td>
</tr>
</tbody>
</table>

Selection of subjects from the potential subject pool was governed by the following general principles:

1. Subjects participating in the same conversation were to be of the same involvement type. As many type 1 dyads were to be scheduled as possible, followed by type 3 dyads and finally type 2 dyads.

2. Subjects from the same class section were not to be chosen for the same conversation because they might not be strangers.
3. Subjects were to be randomly assigned to dyad type (i.e., a mixed or matched conversation).

4. Wave 1 subjects were scheduled first and Wave 2 subjects next. Wave 3 subjects were used only after depletion of the first two waves.

At times, practical contingencies caused less stringent application of these principles, especially #3. A high rate of no-shows and last minute cancellations necessitated scheduling three subjects for one conversational time-slot. Thus assignment of dyad type was often contingent on which subjects showed up. People who failed to show or who cancelled were subsequently contacted in an attempt to reschedule them.

Subjects reported to the Behavioral Sciences Laboratory at the Ohio State University. A Graduate Research Associate oriented them to the experiment and the procedures. In the initial portion of the study the subjects were asked to converse with each other for a brief time on any topic of their choosing. The conversation would last six minutes although the subjects did not know this. After ascertaining that the subjects were indeed strangers, it was suggested that they treat the situation as if they were naturally meeting a stranger at a bus stop, a bar, or some other public place. The subjects were informed
1. that the conversation would be videotaped and subsequently viewed only as part of the research project,
2. that they could terminate the conversation at any point,
3. that the videotape would be erased if requested.

It was also indicated that there were other portions of the experiment to follow the conversation. The subjects signed consent forms and removed their watches(13) prior to being escorted to the taping room.

Near the middle of the taping room the subjects were seated facing each other in armchairs placed approximately three feet apart. Small lavalier microphones were worn around the subjects' necks. The research assistant told the subjects that he/she would return to stop their conversation at the proper time. At the beginning of taping each subject repeated his/her name so that the subjects could be correctly identified on the audio tracks.

The conversation was videotaped from the side through a plain glass window in the wall. The camera was visible to the subjects although not obtrusively so because it was partially hidden behind a piece of black poster board. The conversation was also recorded in stereophonic audio with each lavalier mike recording on one track. The conversation was videotaped and subsequently viewed only as part of the research project, subsequently viewed only as part of the research project.

(13) Removing their watches was necessitated by an unrelated portion of the larger study whereby subjects were subsequently asked to estimate the length of the conversation.
tion was allowed to continue for six minutes. At this point the research assistant returned to the room and escorted the subjects to separate cubicles elsewhere in the laboratory. The subjects filled out several self-report questionnaires about themselves, their partners, and the conversation itself. Then the subjects returned to the taping room for a 15 minute negotiation session and a final set of questionnaires.

**Transcription of the Conversations**

All sixty conversations (14) were transcribed by the author from the stereo audiotapes. Additional clarity was achieved by using headphones and listening to one channel at a time. Every effort was made to interpret unintelligible segments which were predominantly talkovers. Two additional steps proved helpful in this regard:

1. playing the tape on extremely high quality stereo equipment using filters, and

2. viewing the videotape to watch the subjects' lips.

If the transcription was still doubtful or uncertain after these steps, the segment was marked as inaudible.

(14) One conversation was eliminated from the corpus during data collection because the two subjects were foreigners and friends. One additional dyad of the same type was recorded to complete the data corpus.
Normal English orthography was used in the transcript. Speakers were identified in the text as either A or B. The subject ID numbers were listed for speakers A and B at the top of the text. The following notational conventions were used in the transcript.

( ) inaudible segment of text

(12 secs) inaudible segment of text 12 seconds in length

A: ...[...] start and stop of a talkover
B: [.....] (stop indicated only when helpful)

? question and exclamation marks added when warranted by the intonation pattern

" " quoted speech in the text with speaker lexically indicated

(sp:name) " " quoted speech in the text with speaker identifiable by a role voice

(sp:? ) " " quoted speech in the text with speaker being unclear or ambiguous
Coding Procedures

Because of the extensive time required to code the CHI, the corpus of transcripts was halved. Five transcripts were chosen at random from within each cell of the design. Thus the final corpus had a total of 30 conversations.

The complexity and difficulty of the coding procedures for the CHI increase geometrically as the text length increases. At some point near 60 T-units it becomes unproductive and unreliable to code entirely by hand because the tasks of recording and tabulating coding decisions becomes extremely time consuming and prone to mistakes. In a pilot test on a conversation of average length (170 T-units) it took almost one hour to identify, code and tabulate one identity chain referring to one speaker. With an average of 80-100 identity and similarity chains per conversation coding by hand was unfeasible. Therefore a set of computer-assisted coding procedures was developed so that the computer handled all the functions of recording, tabulating, and counting. In addition, a few of the simple coding procedures were done by computer (i.e., computing the chain interactions and coding interactive/noninteractive/initial tokens). The computer-assisted procedures used the text-editing capabilities of Wylbur to generate a concordance of the lexically rendered text and then to affix chain identifying numeric codes prior to each token. PL1 programs were
used to execute coding algorithms and to count the frequencies of the final codes (such as central, relevant, peripheral).

Data entry for each conversation took approximately 10-13 hours. The time required for the actual coding procedures was about the same as well. Without the computer assisted procedures this study would have been impossible. It is also felt that the verification procedures built into the programs considerably increased the accuracy of the measures.

The CHI has been previously utilized in an extensive research project by King and Rentel (1981), and Rentel and King (1983). The coders in that project were all highly sophisticated in linguistics and quite conversant with the formulations of systemic grammar. Rentel and King (1983) report an overall coding reliability of .77 for the CHI (computed as a simple correlation coefficient between ratings on 36 texts by two coders.) Recognizing the extensive experience of their coders Rentel and King (1983) speculate that their coding reliability might be higher than what could be expected from less experienced coders.

In this study every conversation was coded by the author, who has an extensive linguistics background comparable to the coders in Rentel and King (1983). However, there were no coders available with a similar degree of
linguistic sophistication to serve as coders in a reliability check. Therefore, rather than abandoning a reliability check altogether, it was decided to use one graduate and two undergraduate coders who had a communication background but no linguistics background. Extensive training sessions were held. In fact, the coder for the second stage had to read and master much of Halliday and Hasan's (1976) *Cohesion in English*. One additional graduate coder was dropped because of inability to master the coding scheme.

The reliability check consisted of six conversations with one chosen randomly from each cell of the design. Each stage of the coding process was handled by one of the coders trained specifically for that coding procedure. Each coder and the author had to demonstrate an intercoder reliability of .85 on a practice transcript before the coder was allowed to start coding the six transcripts in the reliability corpus.

The CHI bears an inherent problem in intercoder reliability insofar as the CHI is computed as the end result of the four stage hierarchical coding process listed as follows:

1. interpretation of cohesive devices
2. lexical rendering of the text (i.e., deletion of all function words)
3. formation of identity chains and similarity chains
4. coding of semantic functions. Coding disagreements in earlier stages are magnified as later stages of coding are layered over them. Therefore it is considerably more difficult to achieve acceptable reliability levels for the CHI than for a more normal one stage coding procedure.

The overall coding reliability for Rentel's version of the CHI was computed for the 12 speakers in the reliability sample. The simple correlation coefficient between the two CHI scores computed for each speaker was .70, compared to .77 in Rentel and King (1983). Cronbach's alpha (computed with the Reliability program of SPSS) was .82. Given the extremely complex and hierarchical nature of the coding procedures and the lack of linguistic expertise on the part of the coders in the reliability check, it was felt that the reliability achieved was quite acceptable.
CHAPTER FOUR

RESULTS

**Stepwise discriminant analysis of dependent variables**

As a first step in the analysis of the conversational data it was decided to run a stepwise discriminant analysis (using SAS) to determine which of the various versions of the CHI were better discriminators of dyadtype. The relative discrimination of Hasan's version of the CHI (central tokens/total tokens) and Rentel's version (central tokens/relevant tokens) was of special interest. Other CHI measures included were the Cohesive Density Index, the Interactive CHI, the Noninteractive CHI, and Rentel's CHI residualized on the number of T-units. A significance level of .15 was required for entry of a variable. Hasan's version of the CHI was the only variable entered: Wilk's Lambda = 0.675, $F(2,27) = 6.486, p = 0.005$. On the second step, however, the Interactive CHI just missed entry: $F(2,27) = 1.988, p = .157$. No other variables even approached the entry level of significance. It was felt that the Interactive CHI represented sufficient variance to be
retained in subsequent analyses. Rentel's version of the CHI, the Cohesive Density Index, the Noninteractive CHI, and the residualized form of Rentel's CHI were all dropped from subsequent analysis.

A similar stepwise discriminant analysis on dyadtype was run for total number of tokens in the conversation, the number of T-units in the conversation, and the number of tokens per T-unit. The number of tokens/T-unit was entered on step 1: Wilk's Lambda = 0.776, $F(2,27) = 3.890$, $p = .033$; and number of tokens was entered on step 2: Wilk's Lambda = 0.645, $F(2,27) = 2.637$, $p = .091$. However, number of T-units also exhibited significance on the first two steps although it was not ultimately entered. Thus it was decided to retain all three of these variables in subsequent analysis.

**Multivariate Analyses of Variance**

Two Manovas were run on the conversational data using the SAS statistical package. The model entered included main effects for dyadtype (high-high, high-low, low-low) and sex (male, female) and an interaction effect. The initial Manova utilized all seven dependent variables as listed in the original hypotheses. The CHI utilized was Hasan's version as indicated by the stepwise discriminant analysis reported above. Partial results will be reported for this
Manova; only results for those variables excluded later from the reestimated model will be reported. Results will be reported in full for the Manova on the reestimated model.

**Manova on the initial model.** In the first Manova, the dependent variables were Hasan's CHI, the Interactive CHI, the Noninteractive CHI, the CDI, number of T-units, number of tokens, and the number of tokens/T-unit. A significant multivariate F was obtained for the main effect of dyad-type. See Table 4 for a detailed display of the multivariate statistics.

---

Insert Table 4 here

---

Seven follow-up univariate analyses of variance were performed for the main effect of dyad-type, one for each of the dependent variables. Since the results obtained for five of the variables are replicated in the second Manova which was run on the reestimated model, these results will not be reported now. However, the results of the follow-up Anovas for the Noninteractive CHI and the CDI will be presented now.

The Noninteractive CHI is computed as the noninteractive central tokens/relevant tokens. (15) It represents the de-

(15) Because interactive, noninteractive and initial tokens are all relevant tokens, the number of relevant tokens
<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Wilk's Lambda</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyadtype</td>
<td>2</td>
<td>0.306</td>
<td>2.08</td>
<td>.039</td>
</tr>
<tr>
<td>Sex</td>
<td>1</td>
<td>0.657</td>
<td>1.34</td>
<td>.287</td>
</tr>
<tr>
<td>Dyadtype X</td>
<td>2</td>
<td>0.541</td>
<td>0.92</td>
<td>.543</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
gree to which coherence is created and maintained by chaining back to one's own utterances.

Insert Tables 5 and 6 here

As can be seen in Table 6, dyadtype does not obtain a significant $F$ statistic. Therefore it was decided to drop the Noninteractive CHI from subsequent analysis.

Pappas (1981) computed the Cohesive Density Index (CDI) as relevant tokens/total tokens. It was designed as a companion measure to Rentel's version of the CHI (central tokens/relevant tokens).

Insert Tables 7 and 8 here

The univariate $F$ statistic on CDI for dyadtype was significant, $F(2,24) = 4.16, p < .028$, but in the opposite direction from that predicted.

Tukey's HSD test was used in order to perform a post-hoc analysis of the means for each level of dyadtype. Results indicated that the high-high condition was significantly different from the low-low condition. Post-hoc analysis is used as the denominator of both the Noninteractive and Interactive CHI.
<table>
<thead>
<tr>
<th>Dyadtype</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-high</td>
<td>0.401</td>
<td>0.043</td>
<td>10</td>
</tr>
<tr>
<td>High-low</td>
<td>0.419</td>
<td>0.036</td>
<td>10</td>
</tr>
<tr>
<td>Low-low</td>
<td>0.389</td>
<td>0.043</td>
<td>10</td>
</tr>
<tr>
<td>Overall</td>
<td>0.403</td>
<td>0.041</td>
<td>30</td>
</tr>
</tbody>
</table>

TABLE 5

Means and Standard Deviations of Noninteractive Cohesive Harmony Index by Dyadtype
<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyadtype</td>
<td>2</td>
<td>0.0022</td>
<td>1.31</td>
<td>.289</td>
</tr>
<tr>
<td>Sex</td>
<td>1</td>
<td>0.0001</td>
<td>0.05</td>
<td>.820</td>
</tr>
<tr>
<td>Dyadtype X Sex</td>
<td>2</td>
<td>0.0022</td>
<td>1.29</td>
<td>.291</td>
</tr>
<tr>
<td>Error</td>
<td>24</td>
<td>0.0169</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**TABLE 7**

Means and Standard Deviations of Cohesive Density Index by Dyadtype

<table>
<thead>
<tr>
<th>Dyadtype</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-high</td>
<td>0.926</td>
<td>0.018</td>
<td>10</td>
</tr>
<tr>
<td>High-low</td>
<td>0.943</td>
<td>0.011</td>
<td>10</td>
</tr>
<tr>
<td>Low-low</td>
<td>0.944</td>
<td>0.018</td>
<td>10</td>
</tr>
<tr>
<td>Overall</td>
<td>0.938</td>
<td>0.018</td>
<td>30</td>
</tr>
<tr>
<td>Source</td>
<td>df</td>
<td>MS</td>
<td>F</td>
</tr>
<tr>
<td>-----------------</td>
<td>----</td>
<td>--------</td>
<td>-----</td>
</tr>
<tr>
<td>Dyadtype</td>
<td>2</td>
<td>0.0011</td>
<td>4.16</td>
</tr>
<tr>
<td>Sex</td>
<td>1</td>
<td>0.0003</td>
<td>1.05</td>
</tr>
<tr>
<td>Dyadtype X Sex</td>
<td>2</td>
<td>0.0002</td>
<td>0.87</td>
</tr>
<tr>
<td>Error</td>
<td>24</td>
<td>0.0003</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
using the LSD test indicated a significant difference not only between the high-high and low-low conditions but also between the high-high and the high-low condition. It should be noted that the LSD test is more powerful than Tukey's HSD test but does not control as well for experiment-wise error rate. In this sense Tukey's HSD test is the more conservative test.

It was decided to delete the CDI from subsequent analysis for the following reasons:

1. Rentel's version of the CHI is the companion measure to the CDI and had been deleted in favor of Hasan's version of the CHI.

2. The CDI shared considerably more variance with Hasan's CHI ($r=.55$) than with Rentel's CHI ($r=.28$).

3. The stepwise discriminant analysis showed that the Interactive CHI was considerably more discriminating in conjunction with Hasan's CHI than the CDI was.

**Manova on the reestimated model.** A second Manova was run on the conversational data using five dependent variables, namely, Hasan's CHI, the Interactive CHI, number of tokens/T-unit, number of tokens, and number of T-units, in order to improve the precision and discrimination of the model. A significant multivariate $F$ was obtained for the main effect of dyadtype. See Table 9 for the summary of the multivariate statistics.
Because of the significant multivariate main effect for dyadtype, five follow-up univariate analyses of variance were performed.

The first dependent variable in the model was Hasan's CHI.

Significance was obtained for the main effect of dyadtype, \( F(2,24) = 6.88, p < .004 \). In a post-hoc comparison of the means for the three types of dyads, both Tukey's HSD test and the LSD test showed a significant difference between the low-low and high-high conversations and the high-low and high-high conversations, except that the significant difference was in the opposite direction from that predicted. The low-low and high-low conversations had a significantly higher mean CHI than the high-high conversations. Furthermore the mixed or high-low conversations had a mean CHI which was between the mean CHIs for the matched conversations although it was only slightly lower than the the mean CHI for the low-low conversations.

The second dependent variable was the Interactive CHI.
### TABLE 9

**Manova for Reestimated Model with Five Conversational Measures**

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Wilk's Lambda</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyadtype</td>
<td>2</td>
<td>0.388</td>
<td>2.43</td>
<td>.023</td>
</tr>
<tr>
<td>Sex</td>
<td>1</td>
<td>0.887</td>
<td>0.51</td>
<td>.767</td>
</tr>
<tr>
<td>Dyadtype X Sex</td>
<td>2</td>
<td>0.598</td>
<td>1.17</td>
<td>.338</td>
</tr>
<tr>
<td><strong>Error</strong></td>
<td>24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>29</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
TABLE 10

Means and Standard Deviations of Hasan's Cohesive Harmony Index by Dyadtype

<table>
<thead>
<tr>
<th>Dyadtype</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-high</td>
<td>0.707</td>
<td>0.052</td>
<td>10</td>
</tr>
<tr>
<td>High-low</td>
<td>0.754</td>
<td>0.031</td>
<td>10</td>
</tr>
<tr>
<td>Low-low</td>
<td>0.769</td>
<td>0.034</td>
<td>10</td>
</tr>
<tr>
<td>Overall</td>
<td>0.744</td>
<td>0.047</td>
<td>30</td>
</tr>
</tbody>
</table>
TABLE 11

Anova of Hasan's Cohesive Harmony Index for Conversations by Dyadtype and Sex

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyadtype</td>
<td>2</td>
<td>0.0104</td>
<td>6.88</td>
<td>.004*</td>
</tr>
<tr>
<td>Sex</td>
<td>1</td>
<td>0.0016</td>
<td>1.04</td>
<td>.319</td>
</tr>
<tr>
<td>Dyadtype X Sex</td>
<td>2</td>
<td>0.0027</td>
<td>1.81</td>
<td>.186</td>
</tr>
<tr>
<td>Error</td>
<td>24</td>
<td>0.0150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
With the significant univariate result for the main effect of dyadtype, $F(2, 24) = 4.99, p < .016$, follow-up comparisons were made for the mean Interactive CHI scores for the three types of conversations. Tukey's HSD test showed that the mean Interactive CHI was significantly higher for the low-low conversations than for the high-high conversations, but not for the high-low conversations. The LSD test showed that the Interactive CHI was significantly higher for the low-low conversations than for both the high-high and high-low conversations. In both cases though the significant difference lies in the opposite direction from that predicted.

The third dependent variable investigated was the mean number of tokens per T-unit in the conversation. This measure reflects the syntactic complexity of the utterances in a conversation.
TABLE 12

Means and Standard Deviations of Interactive Cohesive Harmony Index by Dyadtype

<table>
<thead>
<tr>
<th>Dyadtype</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-high</td>
<td>0.283</td>
<td>0.058</td>
<td>10</td>
</tr>
<tr>
<td>High-low</td>
<td>0.300</td>
<td>0.049</td>
<td>10</td>
</tr>
<tr>
<td>Low-low</td>
<td>0.349</td>
<td>0.046</td>
<td>10</td>
</tr>
<tr>
<td>Overall</td>
<td>0.311</td>
<td>0.057</td>
<td>30</td>
</tr>
</tbody>
</table>
TABLE 13
Anova of Interactive Cohesive Harmony Index
for Conversations by Dyadtype and Sex

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyadtype</td>
<td>2</td>
<td>0.0119</td>
<td>4.99</td>
<td>.016*</td>
</tr>
<tr>
<td>Sex</td>
<td>1</td>
<td>0.0065</td>
<td>2.72</td>
<td>.112</td>
</tr>
<tr>
<td>Dyadtype X Sex</td>
<td>2</td>
<td>0.0034</td>
<td>1.65</td>
<td>.213</td>
</tr>
<tr>
<td>Error</td>
<td>24</td>
<td>0.0034</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dyadtype</td>
<td>Mean</td>
<td>SD</td>
<td>n</td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td>------</td>
<td>-----</td>
<td>----</td>
<td></td>
</tr>
<tr>
<td>High-high</td>
<td>5.729</td>
<td>0.657</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>High-low</td>
<td>6.005</td>
<td>0.488</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Low-low</td>
<td>5.346</td>
<td>0.418</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>5.693</td>
<td>0.581</td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>
TABLE 15

Anova of Mean Number of Tokens per T-unit
for Conversations by Dyadtype and Sex

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyadtype</td>
<td>2</td>
<td>1.0950</td>
<td>4.05</td>
<td>.031*</td>
</tr>
<tr>
<td>Sex</td>
<td>1</td>
<td>0.1727</td>
<td>0.64</td>
<td>.432</td>
</tr>
<tr>
<td>Dyadtype X Sex</td>
<td>2</td>
<td>0.4659</td>
<td>1.72</td>
<td>.200</td>
</tr>
<tr>
<td>Error</td>
<td>24</td>
<td>0.2707</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Dyadtype again was a significant main effect: $F(2, 24) = 2.19, \ p < .031$. Post-hoc analysis with both Tukey's HSD test and the LSD test showed that the syntactic complexity of the high-low conversations was significantly greater than that of the low-low conversations. The syntactic complexity of the high-high conversations was less than that of the high-low conversations and greater than that of the low-low conversations, although neither of these differences was significant.

The fourth dependent variable in the model was total number of tokens in the lexically rendered text of the conversations.

Insert Tables 16 and 17 here

In this univariate analysis of variance the main effect of dyadtype did not obtain a significant $F$ statistic, although it was approaching significance, $F(2, 24) = 2.81, \ p < .08$. An examination of Table 16 shows that the high-low conversations had more tokens than the low-low conversations; the high-high conversations produced the fewest mean tokens per conversation.

The final dependent variable was the number of T-units in a conversation. Table 19 shows no significant differences in the follow-up univariate analysis of variance.
TABLE 16

Means and Standard Deviations of Total Number of Tokens by Dyadtype

<table>
<thead>
<tr>
<th>Dyadtype</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-high</td>
<td>798.3</td>
<td>102.1</td>
<td>10</td>
</tr>
<tr>
<td>High-low</td>
<td>918.1</td>
<td>071.1</td>
<td>10</td>
</tr>
<tr>
<td>Low-low</td>
<td>864.9</td>
<td>145.6</td>
<td>10</td>
</tr>
<tr>
<td>Overall</td>
<td>860.4</td>
<td>117.8</td>
<td>30</td>
</tr>
</tbody>
</table>
### TABLE 17

**Anova of Total Number of Tokens**

for Conversations by Dyadtype and Sex

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyadtype</td>
<td>2</td>
<td>36,029.8</td>
<td>2.81</td>
<td>.080</td>
</tr>
<tr>
<td>Sex</td>
<td>1</td>
<td>6,720.0</td>
<td>0.52</td>
<td>.476</td>
</tr>
<tr>
<td>Dyadtype X Sex</td>
<td>2</td>
<td>7,888.6</td>
<td>0.62</td>
<td>.549</td>
</tr>
<tr>
<td>Error</td>
<td>24</td>
<td>12,824.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>29</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 18 does show that the high-high conversations produce fewer T-units than the high-low and the low-low conversations respectively.
<table>
<thead>
<tr>
<th>Dyadtype</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-high</td>
<td>141.1</td>
<td>24.5</td>
<td>10</td>
</tr>
<tr>
<td>High-low</td>
<td>153.6</td>
<td>15.4</td>
<td>10</td>
</tr>
<tr>
<td>Low-low</td>
<td>162.6</td>
<td>29.1</td>
<td>10</td>
</tr>
<tr>
<td>Overall</td>
<td>152.4</td>
<td>24.5</td>
<td>30</td>
</tr>
<tr>
<td>Source</td>
<td>df</td>
<td>MS</td>
<td>F</td>
</tr>
<tr>
<td>------------------------</td>
<td>----</td>
<td>-------</td>
<td>----</td>
</tr>
<tr>
<td>Dyadtype</td>
<td>2</td>
<td>1,165.9</td>
<td>1.93</td>
</tr>
<tr>
<td>Sex</td>
<td>1</td>
<td>607.5</td>
<td>1.01</td>
</tr>
<tr>
<td>Dyadtype X Sex</td>
<td>2</td>
<td>33.3</td>
<td>0.06</td>
</tr>
<tr>
<td>Error</td>
<td>24</td>
<td>603.0</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Discriminant Analysis

Having found a significant multivariate $F$ for the main effect of dyadtype, a discriminant analysis was performed on dyadtype using the reestimated model with the five conversational measures as predictor variables. The SPSS-X discriminant analysis program with the classification option was used to perform the analysis.

Insofar as dyadtype has three classes of conversations, the maximum number of discriminant functions which may be obtained is two. Table 20 presents the summary statistics for the two discriminant functions obtained.

---

Insert Table 20 here
---

Discriminant function 1 was found significant at the $p < .05$ level whereas discriminant function 2 was significant only at the $p < .10$ level. Since this is the first discriminant analysis utilizing the cohesive harmony model, it was felt that a liberal stance with regard to level of significance required was heuristically advantageous for further refinement of the model. Thus $p < .10$ was considered a sufficient level of significance for the present purposes and discriminant function 2 was retained in the analysis.
Table 20
Summary Statistics of Discriminant Functions for Dyadtype

<table>
<thead>
<tr>
<th>Discriminant Function</th>
<th>Canonical R</th>
<th>Wilk's Lambda</th>
<th>$X^2$</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.610</td>
<td>0.456</td>
<td>19.65</td>
<td>10</td>
<td>0.033*</td>
</tr>
<tr>
<td>2</td>
<td>0.523</td>
<td>0.726</td>
<td>7.99</td>
<td>4</td>
<td>0.092</td>
</tr>
</tbody>
</table>
In tandem the two discriminant functions account for approximately 55% of the variance among dyadtypes. After the removal of the first discriminant function the second function accounts for approximately 27% of the variance among dyadtypes. The large amount of variance accounted for by the second function was another reason for retaining this function in the analysis.

Table 21 presents the structure coefficients indicating the correlations between the discriminant functions and the discriminating variables.

The first discriminant function is highly correlated with Hasan's CHI and the number of tokens in a text. The second discriminant function is highly correlated with the number of tokens per T-unit and the Interactive CHI. The number of T-units correlates almost equally with both discriminant functions. Finally Hasan's CHI also correlates highly with the second discriminant function (.551) but not as highly as with the first function (.785).

Table 23 presents the group centroids on both discriminant functions for each of the three types of conversa-
Table 21
Structure Coefficients between Discriminant Functions and Five Conversational Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Function 1</th>
<th>Function 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hasan's CHI</td>
<td>.785</td>
<td>.551</td>
</tr>
<tr>
<td>Total Number of Tokens</td>
<td>.595</td>
<td>-.142</td>
</tr>
<tr>
<td>Mean Number of Tokens per T-unit</td>
<td>.122</td>
<td>-.861</td>
</tr>
<tr>
<td>Interactive CHI</td>
<td>.362</td>
<td>.821</td>
</tr>
<tr>
<td>Total Number of T-units</td>
<td>.389</td>
<td>.411</td>
</tr>
</tbody>
</table>
Table 22
Group Centroids in the Discriminant Space
for Dyadtype

<table>
<thead>
<tr>
<th>Dyadtype</th>
<th>Function 1</th>
<th>Function 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-high</td>
<td>-.996</td>
<td>-.220</td>
</tr>
<tr>
<td>High-low</td>
<td>.737</td>
<td>-.577</td>
</tr>
<tr>
<td>Low-low</td>
<td>.258</td>
<td>.798</td>
</tr>
</tbody>
</table>
Figure 6. Group Centroids in the Discriminant Space for Dyadtype
tions. Figure 6 plots the centroids in graphic form. Table 23 presents the results of the classification analysis run on the data for the same 30 conversations. A test of equality of group covariance matrices using Box's M indicated no reason to adopt more stringent methods in the classification analysis.

In the classification analysis 63.33% of the conversations were correctly classified. The expected rate by chance alone would be 33.33%. It had been expected that the mixed or high-low conversation would be the most difficult to classify correctly. However, the mixed condition was predicted more accurately than either of the two matched conditions.
Table 23

Results of Classification Analysis

<table>
<thead>
<tr>
<th>Actual Group</th>
<th>N of Cases</th>
<th>Predicted Group Membership</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>High-High</td>
</tr>
<tr>
<td>High-High</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>60%</td>
</tr>
<tr>
<td>High-Low</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20%</td>
</tr>
<tr>
<td>Low-Low</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20%</td>
</tr>
</tbody>
</table>
**Supplementary Analysis**

Further data analysis was done on the dependent measures associated with individual speakers. Several of the measures are directly parallel to measures used for conversations, i.e., number of tokens per speaker, number of T-units per speaker, and number of tokens per T-unit per speaker. The situation for the cohesive harmony measures is complicated by the fact that for individual speakers there is an additive and a nonadditive version of each measure. The difference lies in the denominator used in the ratio. For example, if the number of central tokens for each speaker is divided by the total tokens in the conversation, then the CHI for each speaker in the conversation may be added to equal the CHI for the whole conversation. This is the additive version of the CHI for each speaker. The nonadditive versions of the CHI for each speaker cannot be added to equal the CHI for the whole conversation because the denominators are each speaker's total number of tokens.

A stepwise discriminant analysis (using SAS) was run to determine which of the various cohesive harmony measures were better predictors of II level. The additive version of the Interactive CHI was entered on step 1: Wilk's Lambda = 0.849, $F(1, 58) = 10.315, p < .002$. On step 2 the nonadditive version of the CDI was entered: Wilk's Lambda =
The nonadditive version of Hasan's CHI was also retained in the analysis because of a high level of significance on step 1 and because of its theoretical import. Therefore a six variable model was used for the supplementary analysis of individual speakers with the dependent variables being nonadditive Hasan's CHI, additive Interactive CHI, nonadditive CDI, total tokens per speaker, total T-units per speaker, and mean number of tokens/T-unit per speaker.

The experimental design for individual speakers is a 2 X 2 X 2 design with the independent variables being II level (high or low), Sex (male or female), and Conversational Condition (matched or mixed). Given that the matched Conversational Condition includes speakers from both the high-high and low-low dyad types, the design has unequal but proportional cell sizes. Out of 60 speakers, 40 are in the matched Conversational Condition and 20 are in the mixed.

In the Manova run (with SAS) on the data for all speakers, a significant multivariate F was obtained for the interaction effect of II level and Conversational Condition. See Table 24 for the detailed multivariate statistics. The sum of squares used to compute the F statistic were those associated with the full regression model whereby the sum of squares of each effect is adjusted for all other effects in the model. It was felt that the full regression ap-
proach offered the most conservative treatment of main effects.

-------------------------------

Insert Table 24 here

-------------------------------

Since a significant multivariate interaction effect was obtained for II level by conversational condition, the significant multivariate main effect for conversational condition was not interpreted. Six follow-up univariate analyses of variance were performed for the interaction effect of II level and conversational condition.

The first dependent variable in the model was the nonadditive version of Hasan's CHI (i.e., central tokens for speaker/total tokens for speaker).

-------------------------------

Insert Tables 25 and 26, and Figure 7 here

-------------------------------

There was a significant interaction effect between II level and conversational condition, $F(1,52) = 8.72$, $p < .005$. Means and standard deviations relevant to the interaction effect are presented in Table 26. Inspection of the means indicates that the interaction is disordinal insofar
TABLE 24

Manova of Cohesive Harmony Measures
for Individual Speakers

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Wilk's Lambda</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>II Level (II)</td>
<td>1</td>
<td>0.795</td>
<td>2.02</td>
<td>.082</td>
</tr>
<tr>
<td>Sex (S)</td>
<td>1</td>
<td>0.837</td>
<td>1.52</td>
<td>.192</td>
</tr>
<tr>
<td>Conversational Condition (CC)</td>
<td>1</td>
<td>0.750</td>
<td>2.61</td>
<td>.029*</td>
</tr>
<tr>
<td>II X S</td>
<td>1</td>
<td>0.837</td>
<td>1.52</td>
<td>.191</td>
</tr>
<tr>
<td>II X CC</td>
<td>1</td>
<td>0.766</td>
<td>2.39</td>
<td>.042*</td>
</tr>
<tr>
<td>S X CC</td>
<td>1</td>
<td>0.912</td>
<td>0.76</td>
<td>.607</td>
</tr>
<tr>
<td>II X S X CC</td>
<td>1</td>
<td>0.931</td>
<td>0.58</td>
<td>.743</td>
</tr>
<tr>
<td>Error</td>
<td>52</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>59</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
TABLE 25
Anova of Nonadditive Hasan's Cohesive Harmony Index
by II Level, Sex, and Conversational Condition
for Individual Speakers

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>II Level (II)</td>
<td>1</td>
<td>0.00644</td>
<td>2.41</td>
<td>.127</td>
</tr>
<tr>
<td>Sex (S)</td>
<td>1</td>
<td>0.00703</td>
<td>2.63</td>
<td>.111</td>
</tr>
<tr>
<td>Conversational Condition (CC)</td>
<td>1</td>
<td>0.00414</td>
<td>1.55</td>
<td>.219</td>
</tr>
<tr>
<td>II X S</td>
<td>1</td>
<td>0.00040</td>
<td>0.15</td>
<td>.699</td>
</tr>
<tr>
<td>II X CC</td>
<td>1</td>
<td>0.02327</td>
<td>8.72</td>
<td>.005*</td>
</tr>
<tr>
<td>S X CC</td>
<td>1</td>
<td>0.00713</td>
<td>2.67</td>
<td>.108</td>
</tr>
<tr>
<td>II X S X CC</td>
<td>1</td>
<td>0.00186</td>
<td>0.70</td>
<td>.407</td>
</tr>
<tr>
<td>Error</td>
<td>52</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>59</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 26
Means and Standard Deviations of Nonadditive Hasan’s Cohesive Harmony Index
by II Level and Conversational Condition

<table>
<thead>
<tr>
<th>II Level</th>
<th>Conversational Condition</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Matched</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>SD</td>
<td>n</td>
<td>X</td>
<td>SD</td>
<td>n</td>
<td>X</td>
</tr>
<tr>
<td>High</td>
<td>.708</td>
<td>.068</td>
<td>20</td>
<td>.768</td>
<td>.040</td>
<td>10</td>
<td>.728</td>
</tr>
<tr>
<td>Low</td>
<td>.772</td>
<td>.044</td>
<td>20</td>
<td>.748</td>
<td>.036</td>
<td>10</td>
<td>.764</td>
</tr>
<tr>
<td>Overall</td>
<td>.740</td>
<td>.065</td>
<td>40</td>
<td>.758</td>
<td>.039</td>
<td>20</td>
<td>.746</td>
</tr>
</tbody>
</table>
Figure 7. Involvement Level by Conversational Condition Interaction for Hasan's Cohesive Harmony Index of Individual Speakers
as high involved subjects display the opposite pattern of low involved subjects. See Figure 7 for a graphic representation of this pattern.

The Scheffe test(16) was used to perform post-hoc pairwise comparisons among the cell means listed in Table 26. The actual comparisons were calculated by hand following the formula in Kennedy (1978) for designs with unequal cell frequencies. Of the six pairwise comparisons made, only two were significant at the .05 level. In the matched conversational condition the mean of low involved subjects (.772) was significantly higher than the mean of high involved subjects (.708). Also for high involved subjects, the mean of the mixed conversational condition (.768) was significantly higher than the mean of the matched condition (.708).

The second dependent variable was the additive version of the Interactive CHI (i.e., interactive central tokens for speaker/ relevant tokens for conversation).

(16) The Scheffe test is used because

1. it controls for the experimentwise error rate
2. it can test for differences of means in designs with unequal cell frequencies
3. it allows for a high percentage of the possible pairwise comparisons to be made
4. it is a very conservative post-hoc test (Kennedy, 1978).
A significant interaction effect between II level and conversational condition was found, $F(1,52) = 4.75$, $p < .024$. Means and standard deviations relevant to the interaction effect are presented in Table 28. Technically the interaction is ordinal. However, the means for low involved and high involved subjects in the mixed conversational condition are for all purposes equal. See Figure 8 for a graphic representation of this interaction. Because of the pattern of the interaction effect, the main effect for II level will not be interpreted separately. The Scheffe tests of pairwise comparisons of means yielded only one result significant at the .05 level. In the matched conversational condition the mean Interactive CHI for low involved subjects (.175) was significantly higher than the mean for high involved subjects (.141). All other pairwise comparisons of means were nonsignificant.

The third dependent variable was the nonadditive Cohesive Density Index (i.e., relevant tokens for speaker/total tokens for speaker).
<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>II Level (II)</td>
<td>1</td>
<td>0.00403</td>
<td>6.56</td>
<td>.013*</td>
</tr>
<tr>
<td>Sex (S)</td>
<td>1</td>
<td>0.00428</td>
<td>6.96</td>
<td>.011*</td>
</tr>
<tr>
<td>Conversational Condition (CC)</td>
<td>1</td>
<td>0.00085</td>
<td>1.39</td>
<td>.245</td>
</tr>
<tr>
<td>II X S</td>
<td>1</td>
<td>0.00089</td>
<td>1.45</td>
<td>.235</td>
</tr>
<tr>
<td>II X CC</td>
<td>1</td>
<td>0.00334</td>
<td>5.44</td>
<td>.024*</td>
</tr>
<tr>
<td>S X CC</td>
<td>1</td>
<td>0.00122</td>
<td>1.99</td>
<td>.164</td>
</tr>
<tr>
<td>II X S X CC</td>
<td>1</td>
<td>0.00092</td>
<td>1.50</td>
<td>.226</td>
</tr>
<tr>
<td>Error</td>
<td>52</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>59</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 28
Means and Standard Deviations of Additive Interactive Cohesive Harmony Index by II Level and Conversational Condition

<table>
<thead>
<tr>
<th>II Level</th>
<th>Matched</th>
<th>Mixed</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (M)</td>
<td>SD (SD)</td>
<td>N</td>
</tr>
<tr>
<td>High</td>
<td>.141</td>
<td>.030</td>
<td>20</td>
</tr>
<tr>
<td>Low</td>
<td>.175</td>
<td>.023</td>
<td>20</td>
</tr>
<tr>
<td>Overall</td>
<td>.158</td>
<td>.031</td>
<td>40</td>
</tr>
</tbody>
</table>
Interactive CHI

Figure 8. II Level by Conversational Condition Interaction for Additive Interactive Cohesive Harmony Index of Individual Speakers
A significant interaction effect between II level and conversational condition was obtained, \( F(1,52) = 4.75, \ p < .034 \). Table 30 presents the means and standard deviations for this interaction effect. Figure 9 shows a technically disordinal interaction and hence the significant main effect for II level is not interpreted. The post-hoc pairwise comparisons using the Scheffe test yielded only one result significant at the .05 level. In the matched conversational condition, the mean CDI for low involved subjects (.949) was significantly higher than that for high involved subjects (.927).

The next variable is number of tokens in the lexically rendered text of an individual speaker.

No significant effects were found for the interaction of II level and conversational condition nor for the main effect of either II level or conversational condition. A significant interaction effect was found for the interaction of II
TABLE 29

Anova of Nonadditive Cohesive Density Index
by II Level, Sex, and Conversational Condition
for Individual Speakers

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>II Level (II)</td>
<td>1</td>
<td>0.00160</td>
<td>4.35</td>
<td>.042*</td>
</tr>
<tr>
<td>Sex (S)</td>
<td>1</td>
<td>0.00007</td>
<td>0.20</td>
<td>.657</td>
</tr>
<tr>
<td>Conversational Condition (CC)</td>
<td>1</td>
<td>0.00076</td>
<td>2.06</td>
<td>.157</td>
</tr>
<tr>
<td>II X S</td>
<td>1</td>
<td>0.00000</td>
<td>0.00</td>
<td>.956</td>
</tr>
<tr>
<td>II X CC</td>
<td>1</td>
<td>0.00174</td>
<td>4.75</td>
<td>.034*</td>
</tr>
<tr>
<td>S X CC</td>
<td>1</td>
<td>0.00024</td>
<td>0.66</td>
<td>.421</td>
</tr>
<tr>
<td>II X S X CC</td>
<td>1</td>
<td>0.00001</td>
<td>0.02</td>
<td>.891</td>
</tr>
<tr>
<td>Error</td>
<td>52</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>59</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 30
Means and Standard Deviations of Nonadditive Cohesive Density Index by II Level and Conversational Condition

<table>
<thead>
<tr>
<th>II Level</th>
<th>Conversational Condition</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Matched</td>
<td>Mixed</td>
<td>Overall</td>
<td>Matched</td>
<td>Mixed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>.927</td>
<td>.024</td>
<td>20</td>
<td>.946</td>
<td>.016</td>
</tr>
<tr>
<td>Low</td>
<td>.949</td>
<td>.015</td>
<td>20</td>
<td>.945</td>
<td>.014</td>
</tr>
<tr>
<td>Overall</td>
<td>.938</td>
<td>.023</td>
<td>40</td>
<td>.946</td>
<td>.015</td>
</tr>
</tbody>
</table>
Figure 9. Involvement Level by Conversational Condition Interaction for Nonadditive Cohesive Density Index of Individual Speakers
### TABLE 31

Anova of Total Tokens by II Level, Sex, and Conversational Condition for Individual Speakers

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>II Level (II)</td>
<td>1</td>
<td>529.2</td>
<td>.04</td>
<td>.837</td>
</tr>
<tr>
<td>Sex (S)</td>
<td>1</td>
<td>3,944.5</td>
<td>.32</td>
<td>.575</td>
</tr>
<tr>
<td>Conversational Condition (CC)</td>
<td>1</td>
<td>24,940.8</td>
<td>2.01</td>
<td>.162</td>
</tr>
<tr>
<td>II X S</td>
<td>1</td>
<td>70,761.6</td>
<td>5.71</td>
<td>.021*</td>
</tr>
<tr>
<td>II X CC</td>
<td>1</td>
<td>9,720.0</td>
<td>.78</td>
<td>.380</td>
</tr>
<tr>
<td>S X CC</td>
<td>1</td>
<td>598.5</td>
<td>.05</td>
<td>.827</td>
</tr>
<tr>
<td>II X S X CC</td>
<td>1</td>
<td>28,029.6</td>
<td>2.26</td>
<td>.139</td>
</tr>
<tr>
<td>Error</td>
<td>52</td>
<td>12,388.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>59</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
level and sex, $F(1,52) = 5.71, p < .021$. However, this effect will not be interpreted because the multivariate $F$ for the interaction effect of II level by Sex was not significant.

The number of T-units in a speaker's text is the next variable investigated.

-----------------------------

Insert Tables 32 and 33

and Figure 10 here

-----------------------------

The interaction effect of II level and conversational condition is significant, $F(1,52) = 4.88, p < .032$. No other effects showed significance. The graphic representation of the interaction effect in Figure 10 shows that the interaction is distinctly disordinal. There were no significant pairwise comparisons of means in the post-hoc analysis using the Scheffe test.

The final variable of interest is the number of tokens per T-unit in a speaker's lexically rendered text.

-----------------------------

Insert Tables 34 and 35

and Figure 11 here

-----------------------------
TABLE 32
Anova of Total T-units
by II Level, Sex, and Conversational Condition
for Individual Speakers

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>II Level (II)</td>
<td>1</td>
<td>0.1</td>
<td>0.00</td>
<td>.988</td>
</tr>
<tr>
<td>Sex (S)</td>
<td>1</td>
<td>297.7</td>
<td>0.96</td>
<td>.333</td>
</tr>
<tr>
<td>Conversational Condition (CC)</td>
<td>1</td>
<td>10.2</td>
<td>0.03</td>
<td>.857</td>
</tr>
<tr>
<td>II X S</td>
<td>1</td>
<td>648.7</td>
<td>2.08</td>
<td>.155</td>
</tr>
<tr>
<td>II X CC</td>
<td>1</td>
<td>1,519.4</td>
<td>4.88</td>
<td>.032*</td>
</tr>
<tr>
<td>S X CC</td>
<td>1</td>
<td>6.1</td>
<td>0.02</td>
<td>.890</td>
</tr>
<tr>
<td>II X S X CC</td>
<td>1</td>
<td>991.9</td>
<td>3.18</td>
<td>.080</td>
</tr>
<tr>
<td>Error</td>
<td>52</td>
<td>311.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>59</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 33
Means and Standard Deviations of Total Number of T-units
by II Level and Conversational Condition

<table>
<thead>
<tr>
<th>II Level</th>
<th>Conversational Condition</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Matched</td>
<td>Mixed</td>
</tr>
<tr>
<td>High</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>81.30</td>
<td>16.48</td>
</tr>
<tr>
<td>Overall</td>
<td>75.93</td>
<td>16.60</td>
</tr>
</tbody>
</table>
Figure 10. II Level by Conversational Condition Interaction for Number of T-units of Individual Speakers
TABLE 34

Anova of Mean Number of Tokens per T-unit
by II Level, Sex, and Conversational Condition
for Individual Speakers

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>II Level (II)</td>
<td>1</td>
<td>0.0563</td>
<td>0.11</td>
<td>.737</td>
</tr>
<tr>
<td>Sex (S)</td>
<td>1</td>
<td>0.0815</td>
<td>0.17</td>
<td>.686</td>
</tr>
<tr>
<td>Conversational Condition (CC)</td>
<td>1</td>
<td>2.2759</td>
<td>4.63</td>
<td>.036*</td>
</tr>
<tr>
<td>II X S</td>
<td>1</td>
<td>1.9048</td>
<td>3.87</td>
<td>.054</td>
</tr>
<tr>
<td>II X CC</td>
<td>1</td>
<td>2.6660</td>
<td>5.42</td>
<td>.024*</td>
</tr>
<tr>
<td>S X CC</td>
<td>1</td>
<td>0.0206</td>
<td>0.04</td>
<td>.839</td>
</tr>
<tr>
<td>II X S X CC</td>
<td>1</td>
<td>0.0055</td>
<td>0.01</td>
<td>.916</td>
</tr>
<tr>
<td>Error</td>
<td>52</td>
<td>0.4920</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>59</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II Level</td>
<td>Conversational Condition</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------</td>
<td>--------------------------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td></td>
<td>Matched</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>SD</td>
<td>n</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>5.71</td>
<td>0.91</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>5.33</td>
<td>0.47</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>5.52</td>
<td>0.74</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mixed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>SD</td>
<td>n</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>5.68</td>
<td>0.62</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>6.19</td>
<td>0.70</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>5.94</td>
<td>0.70</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>SD</td>
<td>n</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>5.70</td>
<td>0.81</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>5.62</td>
<td>0.69</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>5.66</td>
<td>0.75</td>
<td>60</td>
<td></td>
</tr>
</tbody>
</table>

Table 35
Means and Standard Deviations of Mean Number of Tokens per T-unit
by II Level and Conversational Condition
Figure 11. II Level by Conversational Condition Interaction for Mean Number of Tokens per T-unit of Individual Speakers
Significance was found for the following effects: the interaction between II level and conversational condition, $F(1, 52) = 5.42, p < .024$; the main effect for conversational condition, $F(1, 52) = 4.63, p < .036$. The interaction effect for II level by sex was approaching weak significance, $F(1, 52) = 3.87, p < .054$. The main effect for conversational condition is not interpreted because of the significant interaction effect for II level by conversational condition. As can be seen in Figure 11 the interaction is distinctly disordinal. The Scheffe test for follow-up pairwise comparisons of means relevant to the interaction between II level and conversational condition showed only one result significant at .05. For low subjects, the mean syntactic complexity of the matched conversational condition (5.33) was significantly lower than that of the mixed conversational condition (6.19).

The next stage in the supplementary analysis called for deleting the subjects in the mixed conversational condition, i.e., all those subjects who participated in a high-low conversation. The resulting 2 X 2 factorial design is fully balanced for the 40 subjects in the matched condition. A Manova run on these data indicated a significant multivariate statistic for II level: Wilk's Lambda = 0.5954, $F = 3.51, p < 0.009$. Follow-up univariate analyses of variance showed strong significance for the three cohe-
sive harmony measures (Hasan's CHI, $F(1,36) = 11.87$, $p < .0015$; Interactive CHI, $F(1,36) = 16.54$, $p < .0002$; CDI, $F(1,36) = 12.12$, $p < .0013$). The number of T-units was significant to a lesser degree, $F(1,36) = 4.42$, $p < .042$. Total tokens and number of tokens per T-unit were nonsignificant.

The final supplementary analysis investigated the use of grammatical cohesive devices by each speaker. Each cohesive device in the text was coded on two dimensions; namely, the device (reference, reference extended, ellipsis, or substitution), and the interactive character of the cohesive tie (interactive, noninteractive within, noninteractive between).(17) Thus there were twelve subclasses of grammatical cohesive devices, to which another variable, total number of interactive anaphoric devices, was added.

An initial stepwise discriminant analysis was run to discern which were the best predictors of II level for all speakers. The number of interactive anaphoric devices was entered on step 1: Wilk's Lambda $= .8839$, $F(1,58) = 7.613$, $p < .0077$. The only other sizable statistic on step one was interactive ellipsis, $F(1,58) = 6.539$, $p < .0132$. Because these two measures share considerable variance, interactive ellipsis was not entered on step two. However, noninteractive substitution between utterances was entered:

(17) Cf. Chapter 2 for the explanation of the interactive coding of cohesive devices.
Wilk's Lambda = .8433, F(1,57) = 2.747, p < .103. It was decided then to include these three variables in the Manova model as dependent variables.

The Manova (run on SAS) gave a significant multivariate F for II level: Wilk's Lambda = 0.858, F(3,50) = 2.76, p < .052). See Table 36 for the detailed multivariate results.

-------------------------------
Insert Table 36 here
-------------------------------

Follow-up analyses of variance were run on each of the dependent variables: interactive anaphoric devices, interactive ellipses, and noninteractive substitution between utterances.

-------------------------------
Insert Tables 37 and 38 here
-------------------------------

Since there was no significant multivariate F for any of the interaction effects, the Anovas were interpreted using a Type I sum of square which does not adjust the sum of squares for the first effect by any of the other effects. The proportionality of the unequal cell frequencies allowed for the use of such an interpretation.
TABLE 36

Manova of Cohesive Devices
for Individual Speakers

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Wilk's Lambda</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>II Level (II)</td>
<td>1</td>
<td>0.858</td>
<td>2.76</td>
<td>.052*</td>
</tr>
<tr>
<td>Sex (S)</td>
<td>1</td>
<td>0.918</td>
<td>1.49</td>
<td>.228</td>
</tr>
<tr>
<td>Conversational Condition (CC)</td>
<td>1</td>
<td>0.900</td>
<td>1.86</td>
<td>.148</td>
</tr>
<tr>
<td>II X S</td>
<td>1</td>
<td>0.946</td>
<td>0.94</td>
<td>.427</td>
</tr>
<tr>
<td>II X CC</td>
<td>1</td>
<td>0.896</td>
<td>1.94</td>
<td>.135</td>
</tr>
<tr>
<td>S X CC</td>
<td>1</td>
<td>0.976</td>
<td>0.41</td>
<td>.749</td>
</tr>
<tr>
<td>II X S X CC</td>
<td>1</td>
<td>0.902</td>
<td>1.82</td>
<td>.156</td>
</tr>
<tr>
<td>Error</td>
<td>52</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>59</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The first dependent variable investigated was the number of interactive anaphoric devices used by a speaker. The main effect for II level achieved significance: $F(1,52) = 8.47, p < .005$. Significance was also noted for the interaction of II level and conversational condition, although
### TABLE 37

Anova of Total Number of Interactive Anaphoric Devices for a Speaker by II Level, Sex, and Conversational Condition

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>II Level (II)</td>
<td>1</td>
<td>405.60</td>
<td>8.47</td>
<td>.005*</td>
</tr>
<tr>
<td>Sex (S)</td>
<td>1</td>
<td>135.00</td>
<td>2.82</td>
<td>.099</td>
</tr>
<tr>
<td>Conversational Condition (CC)</td>
<td>1</td>
<td>50.70</td>
<td>1.06</td>
<td>.308</td>
</tr>
<tr>
<td>II X S</td>
<td>1</td>
<td>135.00</td>
<td>2.82</td>
<td>.099</td>
</tr>
<tr>
<td>II X CC</td>
<td>1</td>
<td>235.20</td>
<td>4.91</td>
<td>.031*</td>
</tr>
<tr>
<td>S X CC</td>
<td>1</td>
<td>43.20</td>
<td>0.90</td>
<td>.347</td>
</tr>
<tr>
<td>II X S X CC</td>
<td>1</td>
<td>0.30</td>
<td>0.01</td>
<td>.937</td>
</tr>
<tr>
<td>Error</td>
<td>52</td>
<td>47.90</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>59</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II Level</td>
<td>Conversational Condition</td>
<td>Overall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------</td>
<td>--------------------------</td>
<td>---------</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Matched</td>
<td>Mixed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>21.45</td>
<td>5.37</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>22.70</td>
<td>7.33</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>29.45</td>
<td>8.54</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>23.30</td>
<td>6.57</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>25.45</td>
<td>8.12</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td></td>
<td>23.50</td>
<td>6.78</td>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>

Table 38
Means and Standard Deviations of Total Number of Interactive Anaphoric Cohesive Devices by II Level and Conversational Condition
there was no significant multivariate $F$ for this interaction. Table 38 presents the means and standard deviations relevant to this interaction for solely heuristic purposes.

The Anova for the next dependent variable, number of interactive ellipses, is presented in Table 39

Insert Tables 39 and 40 here

As can be seen, the main effect of II level was significant: $F(1,52) = 6.88$, $p < .011$. Again the interaction effect between II level and conversational condition was weakly significant although there was no significant multivariate $F$ for this interaction. See Table 40 for the relevant comparisons of means and standard deviations.

The final dependent variable is the number of noninteractive substitutions between utterances. Table 41 shows the results for the Anova indicating no significant effects.

Insert Table 41 here

Although the analysis of the use of cohesive devices by speakers can be increased in precision, it was felt suffi-
TABLE 39

Anova of Total Number of Interactive Ellipses for a Speaker by II Level, Sex, and Conversational Condition

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>II Level (II)</td>
<td>1</td>
<td>163.35</td>
<td>6.88</td>
<td>.011*</td>
</tr>
<tr>
<td>Sex (S)</td>
<td>1</td>
<td>6.02</td>
<td>0.25</td>
<td>.617</td>
</tr>
<tr>
<td>Conversational Condition (CC)</td>
<td>1</td>
<td>37.41</td>
<td>1.57</td>
<td>.215</td>
</tr>
<tr>
<td>II X S</td>
<td>1</td>
<td>43.35</td>
<td>1.83</td>
<td>.183</td>
</tr>
<tr>
<td>II X CC</td>
<td>1</td>
<td>91.88</td>
<td>3.87</td>
<td>.055</td>
</tr>
<tr>
<td>S X CC</td>
<td>1</td>
<td>29.01</td>
<td>1.22</td>
<td>.274</td>
</tr>
<tr>
<td>II X S X CC</td>
<td>1</td>
<td>6.08</td>
<td>0.26</td>
<td>.615</td>
</tr>
<tr>
<td>Error</td>
<td>52</td>
<td>23.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>59</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 40
Means and Standard Deviations of Total Number of Interactive Ellipses
by II Level and Conversational Condition

<table>
<thead>
<tr>
<th>II Level</th>
<th>Conversational Condition</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Matched</td>
<td>X</td>
<td>SD</td>
<td>n</td>
<td>Mixed</td>
<td>X</td>
<td>SD</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>11.65</td>
<td>3.82</td>
<td>20</td>
<td>12.60</td>
<td>4.77</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>16.70</td>
<td>5.71</td>
<td>20</td>
<td>12.40</td>
<td>4.92</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td>14.18</td>
<td>5.43</td>
<td>40</td>
<td>12.50</td>
<td>4.72</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>13.62</td>
<td>5.23</td>
<td>60</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
TABLE 41

Anova of Total Number of Noninteractive Substitutions between Utterances of a Speaker by II Level, Sex, and Conversational Condition

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>II Level (II)</td>
<td>1</td>
<td>0.267</td>
<td>0.48</td>
<td>.489</td>
</tr>
<tr>
<td>Sex (S)</td>
<td>1</td>
<td>0.267</td>
<td>0.48</td>
<td>.489</td>
</tr>
<tr>
<td>Conversational Condition (CC)</td>
<td>1</td>
<td>1.200</td>
<td>2.18</td>
<td>.146</td>
</tr>
<tr>
<td>II X S</td>
<td>1</td>
<td>0.267</td>
<td>0.48</td>
<td>.489</td>
</tr>
<tr>
<td>II X CC</td>
<td>1</td>
<td>1.633</td>
<td>2.97</td>
<td>.091</td>
</tr>
<tr>
<td>S X CC</td>
<td>1</td>
<td>0.033</td>
<td>0.06</td>
<td>.807</td>
</tr>
<tr>
<td>II X S X CC</td>
<td>1</td>
<td>2.133</td>
<td>3.88</td>
<td>.054</td>
</tr>
<tr>
<td>Error</td>
<td>52</td>
<td>0.550</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>59</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
cient to assist in the interpretation of the results concerning the main hypotheses about differences among the three types of conversations.
CHAPTER FIVE

DISCUSSION

The hypotheses proposed in this study focused on differences in the coherence of conversation among high and low involved speakers. It was assumed that high involved speakers would produce more coherent talk than low involved speakers. In general, the experimental results support the following conclusions:

1. Low involved speakers are no less coherent than high involved speakers.

2. High and low involved speakers use distinctly different conversational styles to create coherence in their talk, and

3. The characteristics of the joint conversational text reflect the manner in which the participants' conversational strategies mesh together.

This chapter is divided into three major sections. The first section presents a broad characterization of the different conversational styles employed by high and low involved speakers, and then surveys how such differences can account for the results of prior research on II. The sec-
ond section is a detailed discussion delineating how the primary and supplementary data analyses in Chapter Four differentiate the conversational styles of high and low involved speakers and the manner in which these styles interact in the three dyadtypes. The final section evaluates the limitations of the study and proposes directions for future research.

The Conversational Styles of High and Low Involved Speakers

Both the conversational data and the speaker data reported in Chapter Four show no clearcut reason to characterize the talk of low involved speakers as incoherent. On the whole, low involved speakers produce more cohesive harmony in their talk than do high involved speakers. However, low involved speakers create coherence by using a different conversational style than high involved speakers do.

Low involved speakers show a greater reliance on the text of the other speaker than do high involved speakers. Rather than responding to the semantic import and pragmatic thrust of the other speaker, low involved speakers play directly off the surface text of the other speaker. They employ a significantly greater number of interactive cohesive devices, especially interactive ellipsis where the antecedent is a specific textual form of the other speaker. In
doing so, they create a greater degree of redundancy in their talk than do high involved speakers. They seem to have less to say on their own and generally abdicate much control and initiative in the conversation. The informativity and complexity of their utterances depend heavily on the informativity and complexity of their partner's utterances.

On the other hand, high involved speakers have more to say of substance, and say it in a more independent fashion. They show a stable pattern of greater complexity in their utterances, no matter who their conversational partner is. They seem either to develop their own topics independently of the other speaker or to develop joint topics using more complex mind-based strategies rather than simpler text-based strategies. They speak more informatively, more complexly, and more independently than low involved speakers.

These differences in the discourse strategies of high and low involved speakers are understandable given the nature of interactive involvement. If a low involved speaker is uncertain of the basic meaning structure of the interaction and uncertain of how the other is viewing the interaction, mind-based inference processes become considerably more difficult. However, the low involved speaker can create coherent conversation by staying very close to the text of the other speaker. If a speaker is not certain of what
to say, the easiest strategy is to depend very explicitly on the text just produced by the other speaker. Doing this consistently, though, entails abdicating a certain degree of control and initiative during the conversation. A high involved speaker, on the other hand, is more confident of what is happening and will assert his/her ideas quite freely. He/she is more willing to depart from the text of the other person to deal with its inferred import or to reassert his/her own concerns. This seems to be a direct discourse manifestation of the positive relationship between II and both self-esteem and assertiveness (Cegala, 1982a, 1982c; Cegala et al., 1982).

Many of the prior research results for II can be accounted for by the differences in the conversational style of high and low involved speakers. In the first place, Brunner (1984) found that there were no significant differences between high and low involved speakers (18) when rated for competence by their conversational partner or outside observers. Given that both high and low involved speakers produced coherent talk in the 30 conversations investigated in this study, it is less likely that there would be differences in competency ratings based on the evaluations of differing conversational styles. Furthermore, the conver-

(18) Brunner (1984) used all 120 subjects from the larger Cegala study; this study used only 60 of those subjects, randomly selected to keep equal n in each of the cells of the design.
sational style of a speaker appeared differently based on the style of the other speaker in the conversation.

Second, Cegala (1981) reported that low involved subjects were less able to manage the flow of conversation in order to elicit sensitive information from a conversational partner without appearing indiscreet. Low involved subjects were more liable to use explicit and abrupt requests for the information whereas high involved subjects managed the flow of conversation so that the requests became appropriate. Such a result is quite consonant with the conversational styles of high and low involved speakers. Basically, low involved speakers are not accustomed to directing the flow of conversation for their own ends. Their style takes its cues and direction from the surface text of the other conversant without extending the perspective or frame of that text. Thus low involved speakers are relatively foreign to the strategic control of conversation and unpracticed at it.

Cegala and Rippey (1984) found that IIS scores accounted for a significant percentage of the leadership ratings for individual members of small problem-solving groups. High leadership ratings would not be expected for low involved speakers who have a reactive dependent conversational style and who are relatively inept at the strategic control of conversation. Nor would high leadership ratings be expect-
ed for speakers who have less to say of substance and complexity. Finally, low involved speakers tend to respond less to the semantic import and pragmatic thrust of the utterances of others. This is certainly not characteristic of higher leadership ratings.

In summary, then, the conversational style used by low involved speakers does enable them to create coherence in their talk. However, the specific features of their style would appear to make them less perlocutionarily effective in their interaction with others.

**Hypothesis Testing**

The first four hypotheses predicted that various measures of coherence (CHI, CDI, Interactive CHI, Noninteractive CHI) would show a significant main effect for dyadtype such that H-H > H-L > L-L. These four hypotheses were not supported by the results. The Noninteractive CHI did not achieve significance for dyadtype.

There were significant findings for dyadtype on Hasan's CHI (p < .01), the Cohesive Density Index (p < .05), and the Interactive CHI (p < .05). However, the ordering of dyads was exactly the opposite of that predicted, i.e., L-L > H-L > H-H. For all three variables post-hoc pairwise comparisons indicated the L-L dyadtype was significantly greater than the H-H dyadtype. Specifically this finding
demonstrates that the stability of paradigmatic and syntagmatic processes was greatest in the conversational text of L-L dyads and lowest in the conversational text of H-H dyads.

This unexpected result calls into question the nature of the relationship between coherence and the concept of cohesive harmony. The rationale behind the hypotheses assumed that there was a positive monotonic linear relation between coherence and cohesive harmony. This assumption was supported by the results of Rentel and King (1983) in studying the development of coherence in various types of texts produced by children from grades one to four. Generally they found that increasing cohesive harmony measures during the observations of this longitudinal study were reflective of the struggles of children as they learned to produce coherent texts. Hasan (1984), however, indicates that in her sample all texts with a CHI (computed by her formula of central tokens/total tokens) over .50 were judged coherent. What then do significant differences in CHI scores above the .50 level indicate? It would seem likely that such results indicate differences in how various conversational styles construct coherence. It is important to recognize that all three dyad types constructed coherent conversation as far as the cohesive harmony measures indicate, but did so in different ways.
From the point of view of information theory, the CHI reflects redundancy. In the classic formulation of information theory, redundancy is a double edged sword insofar as too little redundancy and too much redundancy are both equally undesirable. Too much redundancy can make a text problematic in that the text "bogs down" and becomes boring. Undoubtedly too high a CHI represents precisely this situation, especially if the CHI is computed according to Hasan's formula. It is an open question whether extremely redundant texts would be judged as incoherent or merely as coherent but dull. For the purposes of this study the more conservative stance was adopted, namely, that the experimental results generally indicate that the texts of all three dyads are coherent but differ in how the dyads construct coherent conversation. Further research is needed to determine if the relation of the CHI and coherence is curvilinear in such a fashion that high CHI scores also indicate loss of coherence because of excessive redundancy.

The clearest feature of the differing conversational styles is the amount of explicit redundancy in the text. This feature does seem to have an interactive facet which is evident in comparing the Noninteractive and Interactive CHIs. The dyads show no significant differences in the Noninteractive CHI. Each dyadtype creates the same amount of coherence by each speaker tying back to his/her own ut-
terances. The crucial difference is the significant main effect for the Interactive CHI such that L-L > H-L > H-H. The L-L dyads create more coherence by each speaker tying back to the other speaker's utterances. The L-L dyads are definitely more interactive than the H-L and H-H dyads. Initially then, this is an extremely anomalous result.

The seventh hypothesis predicted a significant main effect for syntactic complexity, as measured by the mean number of tokens per T-unit in the lexically reduced text of conversations, such that H-H > H-L > L-L. This hypothesis was supported to a great extent. The follow-up univariate Anova was significant at the .05 level. In the follow-up comparisons of means the H-H dyads produced utterances that had significantly more tokens per T-unit than the L-L dyads. There were no significant differences between the H-H and H-L dyads, and between the H-L and L-L dyads, although the dyad means were ordered as predicted. Generally the H-H dyads produced more complex utterances, probably because of more complicated phrasal and clausal structures. Since each token in this ratio represents a content word in the lexically reduced text, it can be concluded that the H-H dyads are handling more content in each T-unit than the L-L dyads. This difference is accentuated in light of the greater explicit redundancy of the L-L dyads. The H-H dyads are saying more of informative substance with each T-unit uttered.
The hypotheses about total number of tokens and total number of T-units were supported. No significant effects were found for dyadtype on either variable. But it is interesting to note one nonsignificant trend: the total number of T-units was ordered such that L-L > H-L > H-H.

The final two hypotheses were also confirmed insofar as there was no significant multivariate effect for sex or for the interaction of dyadtype and sex.

In summary, the three types of dyads appeared to possess different conversational styles for achieving coherence. These styles are characterized by differences in CHI, CDI, Interactive CHI, and syntactic complexity.

The differing conversational styles of the dyadtypes are displayed even more clearly by the follow-up discriminant analysis. Examination of the group centroids in Table 22 shows that function 1 discriminates the H-L and L-L dyads from the H-H dyads. Or expressed in terms of binary features, function 1 discriminates the presence or absence of a low involved speaker. Examination of Table 21 establishes that if a low involved speaker is participating in a conversation, the conversation will tend to have a greater stability of paradigmatic and syntagmatic relations (perhaps to the point of excessive redundancy) and a greater number of tokens in the lexically reduced text.
Function 2 discriminates the L-L dyads from the H-H and H-L dyads, or alternatively the absence or presence of a high involved speaker. Should a high involved speaker be present in the dyad, the conversation is characterized by greater syntactic complexity, by less cohesive harmony achieved in tying back to the other speaker and by less cohesive harmony overall. High involved speakers seem to have more of substance to say and to say it in a more complex and independent manner. They seem to focus more on what they have to say whereas the low involved speakers focus more on what the other person says.

The major implication of the discriminant analysis is that high II and low II lead to different discourse strategies. Thus the characteristics of the conversations cannot be predicted solely by simply adding together the characteristics of the participants on one dimension. Rather, the characteristics of the conversations depend on how the discourse strategies of the participants mesh together. In other words, conversations are synergistic systems which are highly dependent on the particular manner in which the elements of the system work together. Conversations are more than simple sums of the discourse traits of the participants.

As presented in Table 21, function 2 represents the absence of a high involved speaker as a positive loading on the function. To interpret the function as a characterization of the presence of a high involved speaker, reverse the polarity of each loading on function 2.
participants. The discourse tendencies of one participant may appear quite differently depending on the discourse tendencies of the other participant.

Additional evidence for this conclusion comes from other results in the follow-up and supplementary data analysis. First, the results of the follow-up classification analysis show that the H-L dyads are the easiest to identify (70% success rate vs. 60% success rate for both the H-H and L-L dyads). If the conversational style of the dyad were dependent on a simple sum of the II scores of the participants, it would be expected that the H-L dyads would be the most difficult to identify. However, there seems to be something quite distinctive about the mixed conversational condition of one high involved speaker and one low involved speaker.

Investigation of the ordering of dyad means on various dependent variables reveals that the order of H-L > H-H > L-L was obtained for the mean number of tokens per T-unit. The same order held for Noninteractive CHI although the Anova was nonsignificant. Such an order of means is not to be expected on the basis of a simple summation of II scores of the participants.
Supplementary Analysis

The most significant evidence for systemic differences among the conversational styles of the dyadtypes comes from the analysis of the data concerning individual speakers. The multivariate statistics in Table 24 show significance at the .05 level for the interaction effect of II level by conversational condition (mixed or matched) and for the main effect of conversational condition but not for the main effect of II level alone.

When the interaction effect for II level by conversational condition is interpreted, the effects of being included in a mixed dyad become clearer. Generally the significant differences between the means for low and high involved speakers occur in the matched condition and disappear in the mixed condition. Usually in the mixed conversational condition the mean of either the low involved speaker or the high involved speaker assimilates to the mean of the other speaker.

Low involved speakers are significantly less interactive when speaking with a high involved speaker than when speaking with a low involved speaker. Low involved speakers also show significantly more complex utterances in the mixed dyad than in the matched dyad whereas the high involved speakers show a stable degree of syntactic complexity in both mixed and matched dyads. In the mixed dyads the low
involved speakers are syntactically more complex than the high involved speakers although not significantly so. High involved speakers exhibit greater CHI and CDI in the mixed condition than in the matched.

In regard to the number of T-units the interaction effect of II level by conversational condition is more complicated. See Figure 10 for a graphic representation of the interaction effect for II level by conversational condition. Instead of the conversational condition having an effect on only one speaker, the conversational condition has an effect on both high and low involved speakers at the same time. In the matched conversational condition the high involved speakers utter less T-units than the low involved speakers, although not significantly so. The mixed condition exhibits the opposite pattern but again with no significant differences between the means of high and low involved speakers. The follow-up univariate Anova did produce a significant interaction effect of II level by conversational condition for the number of T-units. The significant univariate F without any significant follow-up comparisons of means might be attributable to the complete inversion of means for low and high involved speakers in the two conversational conditions.

Analysis of the cohesive devices used by individual
speakers (20) showed two significant differences between low and high involved speakers. Low involved speakers use significantly more interactive anaphoric devices, i.e., cohesive devices whose antecedent lies in the utterances of the other speaker. The second difference involves a subcategory of interactive anaphoric devices. Low involved speakers use significantly more interactive ellipses than high involved speakers. This greater use of interactive ellipsis is particularly well suited to a text-based response to the other speaker. Similarly interactive use of demonstratives would also be an appropriate means for such a discourse strategy. However, in this study reference devices were not coded into the various subcategories. Along with interactive ellipsis, interactive demonstratives might account for the greater number of interactive anaphoric devices used by low involved speakers.

The greater use of interactive ellipsis by low involved speakers is noteworthy because ellipsis creates cohesive harmony easily and quickly. In ellipsis there may be extensive parallelism between two utterances as is evident in the following example.

(20) De Stefano (1983) analysed patterns of cohesive devices in classroom discourse. The roles of teacher and student were distinguished by differing patterns of interactive cohesive devices, i.e., of who tied back to whom.
A: John went home to see his grandmother.
B: His grandmother?

Here B elides the whole first section of A's utterance: John went home to see.... When the ellipsis is interpreted, all the tokens in both utterances participate in automatic chain interactions and hence become central tokens. Thus ellipsis creates cohesive harmony quickly and easily.

In contrast, normal usage of a pronoun creates a paradigmatic relation (i.e., an identity chain), but the constancy of syntagmatic relations required for a chain interaction may or may not occur. Furthermore, even if the chain interaction does occur with the normal use of a pronoun, usually no more than several tokens will become central at one time. Creating cohesive harmony through pronouns requires a great deal more effort in encoding.

At this point it is possible to sketch broadly how these discourse strategies might mesh in a dyadic conversation. Two low involved conversants would look to each other for substance and general direction for the conversation. Neither is quite certain of what to say and both try to tie back to the the other. The number of interactive anaphoric devices is high as each tries to cue off the other's text. The high use of interactive ellipsis (and perhaps interactive demonstratives) creates an inflated CHI, CDI, and In-
terative CHI. There is a lack of movement in the conversation which reflects the redundancy derived from overreliance on the text of the other speaker who also has little to say. The conversation resembles a ping pong match as each speaker merely responds to the text of the other. The number of T-units is greater but the T-units are simpler in content. The net result is a coherent but informationally impoverished conversation.

Two high involved conversants enact one of two optional scenarios.

1. Both speakers have agendas for the discussion. Thus neither speaker tends to pick up on what the other has said. But both speakers present complex and substantive information. In effect both have something to say, are willing to say it, and compete for the floor (or at least share the floor for sequential development of their own individual topics).

2. Both speakers pick up quickly on what the other has said and extend the conversation by responding more to the point of the comments than to the surface text itself.

In both cases the H-H dyads would exhibit a high level of complexity in their comments. The number of T-units would consequently be lower as well. Also, they could leave more unsaid because the other speaker is tracing out inferences
and interpreting beyond the text. Thus the CHI, the CDI, and the Interactive CHI would be lower than for the L-L dyads. Similarly, less usage of interactive ellipsis would not overly inflate the CHI, the CDI, and the Interactive CHI. What is assimilated from the other speaker is woven into more complex information structures without automatically high cohesive harmony and density.

In a H-L dyad there is a complementary meshing of discourse strategies. The low involved speaker is seeking to take cues from the other speaker and to play off the text of the other speaker. The high involved speaker provides substance and direction to the talk. Thus the conversation proceeds smoothly and coherently. The high involved speaker exhibits higher CHI, CDI, and Interactive CHI than in the H-H dyad because the low involved speaker sticks closely to the text of the high involved speaker and this creates central tokens for both speakers.(21)

The low involved speaker achieves a very high mean syntactic complexity through text dependent devices such as extended reference and ellipsis. In using these devices

(21) How the low involved speaker increases the Interactive CHI of the high involved speaker may not be quite so apparent. If a low involved speaker ties quite closely to a comment of the high involved speaker and the high involved speaker then goes on to elaborate, many of the central tokens in the elaboration will be interactive because their last usage was by the low involved speaker. Straight elaboration of the speaker's own comments only produces noninteractive central tokens.
the low involved speaker can embed complex portions of utterances by the high involved speaker in a simple matrix sentence. Consider the following example:

A: I had to see my advisor yesterday at the precise time my tennis match was scheduled.

B: That's a bummer.

The lexically rendered text of B's comment is syntactically more complex than A's comment because A's comment is included in B's utterance as the interpretation for that. Such discourse strategies used in response to another low involved speaker would produce low syntactic complexity. But in conjunction with a high involved speaker who has a normally high syntactic complexity, such a discourse strategy produces a very high syntactic complexity in the lexically rendered text.

The final characteristic to be accounted for in the mixed dyads is the inversion of the means for low and high involved speakers on the number of T-units in the matched and mixed dyads. With more cooperation and less competition from the low involved speaker, the high involved speaker will say more. Alternatively, the high involved speaker may feel constrained to fill in more for the benefit of the low involved speaker. The low involved speaker uses fewer T-units in the mixed condition because the high involved speaker is willing to say more and carry more of the conversational burden.
In summary then, it has been established that the low involved subjects produce conversational text just as coherent as the high involved subjects produce (at least as measured by the CHI and related measures). However, there is a difference in the conversational styles used by low and high involved subjects to create coherence. Furthermore, these styles appear quite differently depending upon the style of the other speaker in a conversation. Thus the pattern of coherence in a conversation is the result of the systemic intermeshing of the conversational styles of the interactants.

Limitations of the study

The validity of the results presented above are constrained by the limitations of this study. This section will discuss the foremost limitations and attempt to evaluate their effect on the validity of the results.

The relatively low reliability for the coding of the CHI is the most serious limiting problem in this study. There is little evidence that the scores obtained for these conversations by the author would be shared by another coder with a competent background in linguistics. Given that the whole corpus of texts was coded by the author, it is feasible to perform a more discriminating reliability check in the future. However this does not circumvent the low reli-
ability which seems to be inevitable because of the hierarchi
cal nature of the CHI. There is a distinct need for variables relevant to coherence which can be coded in one stage. The significant results obtained for the analysis of cohesive devices were based on a respectable reliability of 86.9 (computed as percentage of intercoder agreement). Such coding not only increases reliability but also requires far less coding time and effort.

The second major limitation reflects the overall lack of systematic validation for the CHI. Little is known of the significance of higher CHI scores in relation to the issue of excessive redundancy. It is possible that the CHI scores for low involved speakers in the L-L dyads were approaching the point of indicating decreasing coherence. Without validational studies of the CHI the interpretation of the present results are based on the assumption that high levels of the CHI do not reflect loss of coherence.

A third limitation reflects the extreme amount of time required to code the CHI and related measures. At various points the full coding procedures were condensed or abbreviated. For example, the computer-assisted process for the coding of identity and similarity chains did not require the explicit coding of all lexical cohesive devices. Similarly the number of tokens in the surface text of high and low speakers were not counted. Both measures would assist
considerably in the interpretation of the conversational styles of the dyads and speakers.

The final limitation concerns the artificiality of the conversations in the laboratory setting. Although the experimental setting allowed for considerable control of the independent variables, there were many other factors which could also be operative in this setting. For example, subjects might engage in guessing the experimenter's manipulations and seek to thwart the goal of the experiment by being relatively unresponsive to their conversational partner. Alternatively, subjects who become anxious under conditions of evaluation might become withdrawn, knowing that they were being observed and videotaped. Or subjects might not have found sufficient motivation to become involved in the experiment. Generally, though, it was believed that the experimental setting was conducive to displaying differences in interaction involvement insofar as the subjects were asked to converse with a stranger for no pressing purpose in a setting whose meaning structure was somewhat uncertain.

This final limitation does point out the need to assess the discourse strategies of high and low involved communicators in more natural settings, especially those where subjects are communicating for purposes with which they identify and/or communicating with persons they know. Such
investigation would considerably increase the validity of the conversational styles as described in this study.

Directions for Future Research

In addition to correcting the limitations as discussed above, future research should address the following concerns. First of all, the model describing differences in conversational style for high and low involved speakers needs further refinement by the inclusion of more relevant variables such as the number of tokens in the surface text, lexical cohesive devices, ambiguities and omissions, disfluencies, talkovers, and interruptions of another speaker. Particularly needed is an analysis of the structure of adjacency pairs in the text. For example the high rate of usage by low involved speakers of interactive ellipsis might be attributable to a high rate of questions asked of them in order to keep the conversation going.

Second, the analysis needs to be expanded to include the interpersonal and textual components of semantic coherence as described by Halliday (1979). Of specific concern here is the possibility of differences in the patterns of given/new information and rheme/theme distinctions.

Third, the use of cohesive devices needs to be categorized by the interpretive effort required for their use and their degree of informativeness. Such an analysis would be
able to check in a comprehensive manner whether the low involved subjects are creating coherence in a relatively easy and uninformative fashion.

Fourth, there needs to be study of the topic structure of these conversations. Perhaps the most fruitful strategy would be to code the number and type of topic changes and then to determine the mean number of T-units between topic changes. There should be significant differences between the three types of dyads in the types of topic changes utilized and the mean length of topic continuation.

Fifth, the types of conversational moves utilized by high and low involved speakers needs to be investigated. It is likely that the differing conversational styles are most easily differentiated by a preference for certain conversational moves on the part of high and low speakers. For example, Goldberg (1983) discusses a taxonomy of conversational moves which could be coded from the data on identity chains. Passing moves continue the identity chains of the previous utterance and return the initiative to the other speaker. It is probable that low involved speakers use significantly more passing moves than high involved speakers. Further a high rate of passing moves would account for the higher cohesive harmony rates and the high usage of ellipsis. Alternatively a more complicated scheme for the coding of conversational moves might be em-
ployed. Kreckel's (1981) taxonomy of conversational moves is dependent on the interaction of speech acts and intonational stress. One of the dimensions used in the analysis of speech acts is the dimension of other-directed/self-directed. It might be expected that low involved speakers would use more other-directed speech acts for those categories of speech acts which affirm or adopt the propositional content of the other speaker's utterances.

Sixth, research is needed to investigate the effect of sex on the conversational styles as spelled out in this study. At several points the main effect for sex or the interaction effect for II level by sex approached significance. For example the Interactive CHI showed a significant II by sex interaction for individual speakers although the multivariate F for that interaction was not significant. Interpretation of the interaction showed that high involved males were less interactive than low involved males and both low and high females. This trend is matched by some of the results for the nonverbal behavior of high and low involved subjects.

Finally research is needed on the relationship between the conversational styles spelled out in this study and the nonverbal behavior of the conversants. Probably the most salient aspect of such research would be the search for a consistency in the interactive patterns on both the verbal and nonverbal levels.
Final Summary

The first major conclusion of this study was that both high and low involved speakers create coherence in their conversational text, but that they use different conversational strategies to do so. Specifically, low involved speakers are more dependent on the text of the other speaker. High involved speakers have more to say of substance and say it in a more independent and complex manner. The conversational style of low involved speakers, while allowing them to be illocutionarily effective in the achievement of coherence in conversation, may hamper their strategic abilities (perlocutionary effectiveness) in social interaction.

The second major conclusion of this study was that the textual characteristics of conversations among high and low involved speakers are dependent upon how the conversational styles of the speakers mesh together. Each speaker may bring certain discourse tendencies to a conversation, but how these tendencies are manifested in the conversation depends to a considerable extent on what the other speaker's tendencies are. High and low involved speakers collaborate to create coherent conversation reflective of the systemic intermeshing of their conversational styles.
Appendix A

Interaction Involvement Scale
with Factor Loadings for each Scale Item

1. I am keenly aware of how others perceive me during my conversations. (Perceptiveness)
2. My mind wanders during conversations and I often miss parts of what is going on. (Attentiveness)
3. Often in conversations I'm not sure what to say; I can't seem to find the appropriate lines. (Responsiveness)
4. I carefully observe how others respond to me during my conversations. (Perceptiveness)
5. Often I will pretend to be listening to someone when in fact I'm thinking about something else. (Attentiveness)
6. Often in conversations, I'm not sure what my role is; that is, I'm not sure how I'm expected to relate to others. (Responsiveness)
7. I listen carefully to others during a conversation.  
   (Attentiveness)

8. Often I am preoccupied in my conversation and do not pay complete attention to others.  (Attentiveness)

9. Often in conversations I'm not sure what the other is really saying.  (Responsiveness)

10. Often in conversations I'm not sure what others' needs are (e.g., reassurance, a compliment) until it is too late to respond appropriately.  (Responsiveness)

11. During conversations I am sensitive to others' subtle or hidden meanings.  (Perceptiveness)

12. I am very observant during my conversations with others.  (Perceptiveness)

13. In conversations I pay close attention to what others say and do and try to obtain as much information as I can.  (Perceptiveness and Attentiveness)*

14. Often I feel sort of "unplugged" from the social situation of which I am part; that is, I'm uncertain of my role, others' motives, and what's happening.  (Responsiveness)

15. In my conversations I really know what's going on; that is, I have a "handle on the situation."  (Perceptiveness and Responsiveness)*
16. In my conversations I can accurately perceive other's intentions quite well. (Perceptiveness and Responsiveness)*

17. Often in conversations I'm not sure how I'm expected to respond. (Responsiveness)

18. In conversations I am responsive to the meaning of others' behavior in relation to myself and the situation. (Perceptiveness)

* These scale items have double factor loadings.
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