

CASE GRAMMAR INTERVENTIONS FOR THE OBSESSOID

By

MATTHEW LUKE FERRARA

Bachelor of Arts  
University of Texas  
Austin, Texas  
1976

Master of Science  
Oklahoma State University  
Stillwater, Oklahoma  
1979

Submitted to the Faculty of the Graduate College  
of the Oklahoma State University  
in partial fulfillment of the requirements  
for the Degree of  
DOCTOR OF PHILOSOPHY  
July, 1982

Thesis  
1982D  
F374C  
Cop. 2



CASE GRAMMAR INTERVENTIONS FOR THE OBSESSOID

Thesis Approved:

*Julia L. McMillan*  
\_\_\_\_\_  
Thesis Adviser

*James L. Phillips*  
\_\_\_\_\_

*Joseph Pearl*  
\_\_\_\_\_

*Larry Hochman*  
\_\_\_\_\_

*Jim Anderson*  
\_\_\_\_\_

*Norman N. Durbin*  
\_\_\_\_\_  
Dean of the Graduate College

## ACKNOWLEDGMENTS

I would like to take this opportunity to formally thank all those who helped make the completion of this dissertation possible. First and foremost I extend my thanks to Dr. Julia L. McHale for her support and perseverance. I especially want to thank her for performing the extra duties she incurred after I left campus to begin my internship. I would like to thank my committee members for lending their experience to this project: Dr. James Philips for his expertise in stochastic modeling and the philosophy of science; Dr. Larry Hochhaus for his expertise in psycholinguistics and his meticulous editorial contributions; Dr. Terry Henderson for his expertise in language and psychotherapy; and, Dr. Joseph Pearl for his expertise in humanistic and developmental psychology.

I also extend my gratitude to Marilyn Porter and Amy Goldman for serving as the therapists in this study and Nancy Allison for her long hours of transcription. I also want to thank two latecomers on the scene: Dr. John Smith who encouraged, if not actually coerced, me to complete this dissertation and Dr. Raymond M. Costello for the use of his computer account for the final analyses.

I would like to extend special, heart-felt thanks to my wife, Kathleen Ferrara. I only hope that I can be as instrumental and supportive for her in her upcoming dissertation. I also want to thank my daughter, Elizabeth, who helped me keep perspective on this project.

Finally, I must acknowledge what Lewis Carol knew all along but it took me a dissertation to discover, "They've a temper, some of them--particularly verbs: they are the proudest--adjectives you can do anything with, but not verbs."

## TABLE OF CONTENTS

Chapter	Page
I. INTRODUCTION . . . . .	1
II. LITERATURE REVIEW . . . . .	5
Introduction . . . . .	5
Case Grammar Research in Psychotherapy . . . . .	6
Case Grammar . . . . .	7
Psychotherapy and Case Grammar . . . . .	10
The Obsessive-Compulsive Character . . . . .	21
The Concept of Character . . . . .	22
The Obsessoid . . . . .	23
Psychotherapy Research Methodology . . . . .	29
Issues in Psychotherapy Research . . . . .	29
Single Subject Designs . . . . .	34
Stochastic Analyses in Psychotherapy Research . . . . .	40
Statement of the Problem and Statistical Hypotheses . . . . .	47
Descriptive Statistics . . . . .	51
Case Relation Usage . . . . .	51
Convergence . . . . .	52
Stochastic Analyses . . . . .	52
Case Relation Usage . . . . .	52
Convergence . . . . .	53
III. METHODOLOGY . . . . .	54
Subjects . . . . .	54
Instrumentation . . . . .	56
The Hysteroid-Obsessoid Questionnaire (HOQ) . . . . .	56
Computer Assisted Language Analysis System (CALAS) . . . . .	56
Transcription . . . . .	57
Scoring Procedure . . . . .	57
Case Relations . . . . .	58
Case Relation Categories . . . . .	60
Procedure . . . . .	62
Therapist Training . . . . .	63
Therapeutic Interventions . . . . .	65
IV. RESULTS . . . . .	70
Application of Interventions . . . . .	70
Descriptive Statistics . . . . .	72

Chapter	Page
Experiment One. . . . .	73
Experiment Two. . . . .	77
Stochastic Analyses . . . . .	79
Determining the Markov Model. . . . .	81
Experiment One . . . . .	81
Experiment Two . . . . .	85
Experiment One and Two: Stochastic Analyses of Case Relation Usage. . . . .	91
Experiment One and Two: Chi-Square Analyses for Convergence . . . . .	95
Summary of Results. . . . .	97
 V. DISCUSSION . . . . .	 98
Application of Interventions. . . . .	98
Case Relation Usage . . . . .	102
Descriptive Statistics . . . . .	102
Stochastic Analyses. . . . .	103
Convergence . . . . .	104
Descriptive Statistics . . . . .	104
Stochastic Analyses. . . . .	107
Summary . . . . .	108
Interventions. . . . .	108
Case Relation Usage. . . . .	108
Convergence. . . . .	108
Recommendations for Future Research . . . . .	109
 BIBLIOGRAPHY . . . . .	 111
 APPENDIX A - FILLMORE'S CASE RELATIONSHIPS . . . . .	 118
 APPENDIX B - HOQ . . . . .	 121
 APPENDIX C - CONTACTS OF ELIGIBLE CLIENTS. . . . .	 126
 APPENDIX D - RULES FOR DIVIDING INTERVIEWS INTO SENTENCES. . . . .	 134
 APPENDIX E - TESTS FOR SIGNIFICANCE OF DIFFERENCE BETWEEN TWO PROPORTIONS . . . . .	 137

LIST OF TABLES

Table	Page
I. Percentage of the Time Interventions Were Correctly Applied During Baseline and Intervention Segments. . . .	71
II. Percentage of Case Relations for Baseline and Intervention Segments. . . . .	74
III. Percentage of Case Relations for Baseline and Intervention Segments. . . . .	78
IV. Experiment One - Determining the Order of the Markov Chain	82
V. Test for Stationarity Split-Half Chi-Square. . . . .	84
VI. Transition Probabilities or Baseline and Intervention for Three Parameter Model. . . . .	86
VII. Fixed Point Probability Vector . . . . .	87
VIII. Experiment Two - Determining the Order of the Markov Chain	88
IX. Test for Stationarity Split-Half Chi-Square. . . . .	90
X. Transition Probabilities Baseline and Intervention for Three Parameter Model. . . . .	92
XI. Fixed Probability Vector for Three Parameter Model . . . .	93



LIST OF FIGURES

Figure	Page
1. Experiment One Changes in Case Relation Usage From Base- line to Intervention. . . . .	76
2. Experiment Two Changes in Case Relation Usage From Base- line to Intervention. . . . .	80

## CHAPTER I

### INTRODUCTION

The present study investigates the utility of case grammar in planning and implementing therapeutic interventions. Case grammar was developed by Filmore (1968) in an attempt to specify how speakers convey ideas with words. The fundamental unit of case grammar is the case relation. A case relation is defined as the role assigned to a noun phrase based upon its association with a verb (Clark and Clark, 1977). Filmore suggests that the nine case relations he devised

comprise a set of universal, presumably innate concepts which identify certain types of judgments human beings are capable of making about events that are going on around them: judgments about such matters as who did it, who it happened to and what got changed (p. 57).

The case relation as a unit of analysis made its first appearance in the psychotherapy literature in an attempt to study the occurrence of natural language in a therapy session (Bieber, Patton and Fouhriman, 1977). Natural language was defined as the actual utterances emitted by the client and therapist in a therapy session. The purpose of the study was to ascertain the utility of studying units of verbal communication without relegating them to theoretical categories such as empathy, resistance or transference. Using a case grammar approach, Bieber et al. (1977) focused upon the verb type and case relation usage of a client and therapist in their first, eleventh and twenty-fifth sessions. The results showed that: (1) there was a change in the frequency with which

the client and therapist used different verbs and case relations; (2) initially the client's case grammar habits differed from those of the therapist but by the eleventh interview there was considerable similarity between the two; (3) the therapist's case grammar habits when talking about the client were mirrored by the client when talking about herself.

In a study which appeared simultaneously with the aforementioned study, Patton et al. (1977) provided the theoretical framework for understanding the results Bieber et al. (1977) had obtained. Patton, et al. (1977) developed a model of two person interactions which occur during psychotherapy. The authors posited that: (1) a person's utterances are designed to communicate that person's perception of the world; (2) the verb is the focal point of an utterance since it determines how the noun is to be evaluated. Using this theoretical model the author interpreted the client's acquisition of the therapist's case grammar habits as convergence, i.e., the difference in client and therapist case relation usage diminishes with time. Patton et al. (1977) presented similar evidence taken from a second therapy case and concluded that convergence of case relations usage can and does occur in the context of therapy.

Meara et al. (1970) examined the phenomenon of convergence by taking excerpts from two different time periods in each interview from the film, Three Approaches to Psychotherapy. The units of analysis in this study were four measures of stylistic complexity: number of sentences, average sentence length, number of phrases per turn and number of embedded phrases. The authors found that Perls, Rogers and Ellis all differed with respect to the four measures of stylistic

complexity. The client's stylistic complexity was found to differ across the three interviews. The client showed convergence with Perls on four measures, with Rogers on three and with Ellis on one. The client's stated preference for the therapists correlated highly with the occurrence of convergence. She preferred Perls first, then Rogers and then Ellis. The authors conclude that the therapist's theoretical approach may affect the language by which counseling is conducted and that a client may prefer a therapist with a compatible linguistic style.

In the most recent study of case grammar in psychotherapy, Meara et al. (1981) investigated the relationship between the therapist's stated goals prior to therapy and the language of the client and therapist during that session. The data for this study was also taken from the three interviews in the film, Three Approaches to Psychotherapy. The unit of analysis was comprised of three types of basic verb phrases and two compound verb phrases (Cook, 1979). Hypotheses about the therapist's verb usage were formulated based upon the therapist's stated goal prior to the session. The results supported the hypotheses concerning the verb usage of Rogers and Ellis. The hypothesis concerning Perls' verb usage was not supported. The authors concluded that therapist's stated goals prior to their session do have an impact on the client and therapist's language behavior in that session. They also noted that not all the language behavior observed in a session could be accounted for by the therapist's stated goals. The author's suggest that some interpersonal or interactional variables need to be considered in order to better understand the occurrence of natural language in psychotherapy sessions.

The research conducted on case grammar usage in psychotherapy sessions has followed an orderly progress. First, it was demonstrated that case relations can be used to identify an important psychotherapeutic process whereby the client may acquire the case grammar habits of the therapist (Bieber et al., 1977). Second, a theoretical framework within which one can understand the influence of the therapist upon the client was proposed (Patton et al., 1977). Third, it was discovered that the goals of the therapist have an impact upon the case grammar usage of both the client and the therapist. At this juncture a logical next step would be to investigate the planning and implementing of therapeutic interventions using a case grammar framework.

The purpose of the present study is to assess the effect of case grammar interventions designed for a particular type of client, the obsessoid. Two assumptions are made regarding this situation. First, that the obsessoid client has a specifiable personality which results in a specifiable and observable style of case grammar usage (Pollack, 1977). Second, that altering the obsessoid's case grammar habits will result in corresponding alterations in the obsessoid's personality (Rudstam, 1978). The following is a list of hypotheses which will be investigated by this study:

1. Case Relation Usage - (a) interventions designed to reduce the occurrence of two pathological case relations, the Universal and the Modal, will result in a reduction in usage; (b) interventions designed to increase the client's expression of feelings, the Experiencer case relation, will increase the frequency of the client's expressing feelings.
2. Convergence - the client will acquire the case relation habits of the therapist and these case grammar habits will be consistent with the changes induced by the interventions.

## CHAPTER II

### LITERATURE REVIEW

#### Introduction

The present study endeavors to contribute to the extant research of case grammar usage in therapy by planning and implementing therapeutic interventions in terms of case relations. In the present study the psychotherapeutic process will be operationally defined as the observed sequence of case relations emitted by the client and therapist. The proposed interventions are designed to alter the observed sequence of case relations. An assumption is made that alterations in the client's case grammar usage will cause alterations in the client's behavior and the way he experiences (Korzybski, 1941; Rudestam, 1979). It is anticipated that the findings of this study will have important implications for recognizing and altering the case grammar habits of different types of clients and for the understanding of the psychotherapeutic process as it manifests itself in natural language.

The review of the literature is divided into three sections representing the three major influences underlying the present study. The first section reviews the research of case grammar usage in psychotherapy. The existing research is summarized and related research is presented. The purpose of this section is to familiarize the reader with the case grammar research and delineate its relationship with previous psychological research. The second section reviews the

literature concerning the type of client used in the present study, the obsessive-compulsive type. Special emphasis is given to the language habits of the obsessive compulsive character as the present study is an investigation of language usage in therapy. The third section of the literature review pertains to the methodology employed in the present study, a single subject design using stochastic processes for the data analysis. The rationale for selecting the single subject design in the present study is delineated. Emphasis is given to the use of stochastic analysis in the representation of the psychotherapeutic process.

Although the three major influences underlying the study are given separate sections in the literature review, they should not be viewed as unrelated. The present study is an investigation of psychotherapy with a specific client type. It is assumed that the optimal method of identifying this client's maladaptive style and observing alterations in it is to observe the language used in therapy. It is also assumed that stochastic processes provide the optimal representation of language use and are sensitive to changes in language use. It is anticipated that the confluence of these three factors as specified by the present study will provide important information concerning the psychotherapeutic process.

#### Case Grammar Research in Psychotherapy

Case grammar, a developing grammar which has its roots in Chomsky's Transformation Generative Grammar, is designed to specify how a speaker conceptualizes a situation and then verbally communicates this conceptualization. Because of Case Grammar's focus on the speaker's concept formation and transmission, psychotherapy researchers have begun to

study the case grammar habits of the client and therapist. This section begins with a discussion of the origin and development of case grammar theory. The use of case grammar theory in psychotherapy research will then be discussed. Related psychotherapy research will be presented in order to specify where case grammar research fits in the overall picture of psychotherapy research.

### Case Grammar

The proposition of a sentence is the underlying meaning of a sentence. It is what a speaker hopes to communicate by making an utterance. Linguists have determined that a proposition consists of a verb and one or more noun arguments (Clark and Clark, 1977). The case grammarian analyzes the proposition of the sentence in order to specify how the speaker interrelates the verb with its noun argument(s). In this sense case grammar provides a means for looking into propositions to identify relationships which may prove fundamental in how humans think (Clark and Clark, 1977).

Charles Fillmore (1968) was one of the early developers and proponents of the Case Grammar Theory. Prior to Fillmore's contributions, it was assumed that case was merely an inflectional affix representing a particular syntactic relationship. Fillmore suggested that case is not merely a surface structure component, rather, it is an integral part of a proposition and as such is part of the deep structure of a sentence. Fillmore based his theory on two assumptions: (1) centrality of the syntax--the forms of words are specified with respect to syntactic concepts; (2) covert categories--relevant grammatical properties lack conventional surface structure characteristics.



The fundamental unit of Filmore's grammar is the case relation, which is defined as the role assigned to a noun phrase based upon its association with a verb. Initially, Filmore (1968) specified six case relations: agentive, instrumental, experiencer, objective, goal and locative. He later expanded the number of case relations to nine with the addition of the source, time and extent case relations (Southard, 1972). The present study does not make use of Filmore's nine case relations. Rather, a modified version is employed (see Methodology). Filmore's nine case relations are listed in Appendix A.

Chafe (1970) elaborated on Filmore's case grammar by specifying the function of the verb. Chafe views language as a complex, abstract symbolizing process in which the verb is the most important component. He argues that every sentence of interest or substance is built around a predicative element. Chafe specifies four functions a verb can fulfill in a sentence: (1) states - verbs specifying the condition or state of a noun; (2) process - verbs which refer to nouns which have changed in state or conditions; (3) actions - verbs used to express activity that someone or something does; (4) process-action - a verb using both process and action simultaneously.

Chafe (1970) was primarily concerned with the symbolizing process in human language and the four functions of verbs. His discussion of how verbs and nouns were related focused primarily on two roles nouns could take vis-a-vis a verb: (1) patient - the receiver of the action specified by the verb; (2) agent - the instigator of the action specified by the verb. Although Chafe did not elaborate upon Filmore's case relations, he did elaborate on Filmore's case grammar by specifying the four functions the verb performs. This work was germinal in that it

provided a basis for Cook's Matrix Model of Case Grammar (1979).

Cook's (1979) Matrix Model of Case Grammar represents the most recent development in the case grammar theory. It is a semantically based theory which is contrary to Filmore's assumption of the centrality of syntax. It is also a departure from Filmore in that it is concerned primarily with the function of the verb. In this respect it is more in keeping with Chafe's view, i.e., centrality of the verb. Cook's theory is essentially a hierarchical model of verb functions. He specifies three basic verb types: action, process and state. These are defined in the manner Chafe (1970) proposed. He also specifies three compound verb types; benefactive, experiential and locative. These compound types are derived by combining two of the basic verb types. This would correspond to Chafe's "process-action" type of verb. The contribution Cook makes in his theory is twofold. First, he assigns semantics primacy over syntax, i.e., the communicator's conceptual framework determines what is communicated (Cook, 1979). Second, he provides a parsimonious model of the structure of propositions by positing only three basic verb types. Overall, Cook's model with its semantic emphasis and parsimonious structure is well suited for case grammar and the goal of understanding how people communicate ideas with words.

Case grammar has developed to the point where the verb is recognized as the major component of the proposition. By emphasizing the functions of the verb case grammarians have attempted to delineate the conceptual process by which a speaker organizes and formulates propositions. Because of its emphasis on the speaker's conceptual framework, psychotherapy researchers have started using case grammar in their studies. The following section reviews the extant psychotherapy

research which uses case relations or verb types as a unit of analysis.

### Psychotherapy and Case Grammar

The case relation as a unit of analysis first made its appearance in psychological literature when Bieber et al. (1977) endeavored to study the phenomenon of communicating by 'natural language'. The authors defined natural language as the verbal utterances emitted by therapist and client in a psychotherapy session. They contrast this with the verbal analysis normally conducted in psychotherapy research, content analysis. In content analysis natural language utterances are categorized and tabulated based upon some theoretical orientation, e.g., Freudian or Rogerian. The author's intention was to forego the step of assigning natural language units to theoretical categories. Rather, the authors inspected the natural language habits of the client and therapist to determine what information this level of analysis revealed.

Bieber et al. (1977) examined the verb type and case relation usage of a client and therapist in their first, eleventh and twenty-fifth psychotherapy sessions. The therapist was described as "experienced" and as having a predominantly Rogerian orientation. The client was a twenty year old female college student whose presenting problem concerned family difficulties. The study identified four verb types and four case relations as the variables of interest. The four verb types were: (1) stative - all "to be" verbs; (2) experiencer - verbs expressing feeling, knowing or sensing; (3) benefactive - all "to have" verbs; (4) agentive - all other verbs. The four case relations were: (1) objective - nouns associated with a stative verb; (2) experiencer -

nouns associated with an experiencer verb; (3) benefactive - nouns associated with a benefactive verb; (4) agentive - all other noun-verb relations.

The data was obtained by inspecting three five-minute time segments occurring at the beginning, middle and end of each session. Frequencies and percentages of verb type and case relation usage were calculated for each segment. The results revealed: (1) there was a change in the frequency with which the client and therapist used the various case relations and verb types; (2) initially the therapist's case grammar habits had no effect on the client but by the eleventh interview there was considerable similarity between the two; (3) the therapist's case grammar habits when talking about the client were mirrored when the client was talking about herself.

The authors interpreted these findings as evidence that there is information to be gathered by studying the natural language of the client and therapist. Special emphasis was given to findings (2) and (3) which the authors took as evidence that the client gradually acquires the therapist's case grammar habits. The author's suggest that the client's acquisition of the therapist's case grammar habits is part of the psychotherapeutic process in which the client undergoes two changes. First, the client learns how to make meaningful utterances in the therapy setting. Second, the client's acquisition of the therapist's case grammar habits is indicative of the client's acquisition of alternatives to problems.

An interesting aspect of this study is that the authors did not find it necessary to relate the case grammar categories to existing psychological or personality theory. Normally, psychotherapy studies

employ a content analysis approach in which natural language is assigned to categories which relate to the intrapsyche life of the client and therapist. In eschewing this approach, the Bieber study represents a departure from more traditional language analysis systems. Instead, the authors elect to concentrate on the observable aspects of the verbal interaction to discover what information can be gleaned from this level of analysis. Although this type of analysis is untraditional within the field of psychotherapy research, the present authors were not venturing into uncharted territories. The legitimizing, groundbreaking work in this area was done several years earlier (Bandler and Grinder, 1975).

Bandler and Grinder (1975) are to be credited with developing and promulgating the natural language approach. The authors make two assumptions about language. First, humans use language to represent their experience and to communicate this representation to others. Second, language is a highly structured and rule-governed activity. The authors suggest that these assumptions hold a very important key for understanding and helping people. Assumption One implies that when a client speaks he reveals not only his world view but the source of his problems. Assumption Two implies that how a person speaks reveals how the person creates and maintains problems. By developing some very special listening and talking techniques the authors have proposed numerous psychotherapeutic techniques designed to help the client. The underlying commonality of all these techniques is that they make use of the client's world view as reflected in his language. The goal of these techniques is to apprehend the client's view and instill alternatives where before the client perceived none (Bandler and Grinder,

1975).

Due to the popularity of Bandler and Grinder's approach there has been an increasing interest in natural language habits. Bieber's (1977) study is certainly representative of this trend. Rudestam (1978) is also typical, in both the approach he takes and the language units he discusses. Rudestam's approach is to view language as a mirror of the client's self and world view. The language units Rudestam discusses are sixteen expressions client's use in a maladaptive way: "should", "can't", "won't", "let me", apologies, "it", commands, paradoxes, asking questions, "but" unclear pronouns, "just", "I guess so", "really", "feel-think", and "you make me feel". Rudestam suggests that the therapist can come to know how the client gets himself into trouble by listening to how the client uses these expressions. He suggests that the therapist can help the client by encouraging the client to engage in alternative means of expression. Rudestam states that when clients "experiment with their linguistic habits, cognitive, experiential and behavioral change ensues" (Rudesdam, 1979; p. 190).

Although many therapists and some researchers make use of natural language in their work, the approach is recent enough that it is difficult to fit it into the extant body of verbal studies of psychotherapy. Russell and Stiles (1979) developed a typology for classifying language analysis systems used in psychotherapy research. The authors admitted that their typology was not intended to be exhaustive as they were primarily concerned with developing a system to organize the more familiar and frequently used language systems. For this reason the authors excluded many methods of language analysis from their typology. Absent altogether were natural language systems such

as Bieber's (1977) and Rudestam's (1979). The criteria that these systems failed to meet was the criteria of relating frequencies or percentages of language occurrences to abstract or theoretical categories. Addressing the issue directly, the authors stated, "the typology is not intended to cover systems that classify language units marked for some special syntactic feature such as case" (Russell and Stiles, 1979, p. 406-407).

Bieber's (1977) study demonstrated the utility of studying the occurrence of natural language in psychotherapy. It also raised many questions. Two of these questions were dealt with in the preceding text: (a) how is natural language used in conducting therapy; (b) how do psychotherapy studies of natural language relate to the extant body of psychotherapy literature. The main question posed by this study, and left unanswered, was the question concerning the theoretical framework within which case grammar findings may be organized. The answer to this question was to be found in a related study.

In a study which appeared simultaneously with Bieber (1977), Patton, Fuhriman and Bieber (1977) provided the theoretical framework to organize the findings of case grammar research of psychotherapy. A social-phenomenological model of two person interactions was developed. The model assumed that verbal interactions serve two purposes in human interactions. First, language is used to communicate a speaker's expectations and information about the world. Second, as two individuals interact over a period of time their language habits become increasingly similar. This increasing similarity is a signal for the two speakers that their expectations and information concerning their interaction are compatible. These two assumptions together imply that language is a means whereby speakers share and modify their expecta-

tions and perceptions so that interpersonal interactions may be possible. This process of sharing and modifying expectations in service of the interaction was dubbed "concerted action". The essential factor underlying concerted action was the speaker's willingness to change expectations about interaction.

Change is seen as a logical consequence of verbal interactions. Evidence that change has occurred can be found in the observable manifestations of concerted action. Concerted action may be observed with the presence of one or both of the following: (1) tracking - a similarity in the direction of change in the speaker's use of a linguistic element; (2) convergence - the degree of difference in two speaker's uses of a specified linguistic element diminishes over time. Within the context of this model many syntactic aspects of natural language can be studied, including case relations.

Patton et al. (1977) presented an application of this model to the study conducted by Bieber (1977). Using Bieber's (1977) data, Patton discussed the evidence for the contention that concerted action exists in the form of tracking and convergence. Evidence that tracking had occurred existed in the therapist's and client's variation of verb usage. This variation was similar in direction of change, implying that the speakers developed a mutually agreeable understanding of their relationship. As for the other observable sign of concerted action, the authors found evidence of convergence in the client's and therapist's similarity in the frequency of verb type and case relation usage. The authors suggested that this implied a form of social modeling in which the client acquired the case grammar habits of the therapist. On the basis of these findings Patton concluded that case



grammar could reveal some of the fundamental aspects of two-person interactions.

Patton's contention that language reflects and influences our concept of self and others is not new. Whorf's (1956) theory of linguistic relativity was one of the early examples of this notion. As explicated, Bandler and Grinder (1975) and Rudestam (1979) are also proponents of this view. Perhaps the earliest proponent of this view in the field of psychology was Korzybski (1941). His theory concerning language will be briefly discussed as it is compatible with Patton's model. In fact, Korzybski's work seems to anticipate and support Patton's model.

Korzybski (1941) considers language a powerful man-made device with neuro-linguistic and neuro-semantic roots. It is man-made in that the meaning of a word is determined by concensus; a word acquires meaning by the way people use the word. Language is said to be neuro-linguistic because language is limited by man's cerebral capacity. More specifically, we can talk about and represent only that which we can perceive. The fact that perceptions are limited by physical constraints means that our linguistic representation of the world is limited. On this issue Korzybski states,

Our use of language implies an Aristotelian, two-valued (either-or) anthropomorphic world of 'properties', which ultimately turns out to be, in principle, delusional. How much such delusions affect the individual depends upon his power of resistance to such a harmful neuro-linguistic environment (p. 203).

Korzybski concludes that since a person's perception of his experience is necessarily limited, then language will necessarily reflect these limitations. In order to evince these limitations Korzybski developed an analogy demonstrating the similarities between a map and the territory, and language and the world. Korzybski suggested that there are

three important similarities: (1) a map is not the territory - a word is not the fact; (2) a map can not represent all the territory - a word can not cover all the characteristics of the object; (3) the map is self-reflexive - we can use words to talk about words.

The preceding presentation of Korzybski's theory covers the main features of his theory which occur and reoccur in many current psycholinguistic studies. The two main points in Korzybski's theory which have been cited in Patton (1977), Rudestam (1979) and Bandler and Grinder (1975) are: (1) humans use language to construct their representation of how they perceive the world; (2) humans use language to communicate their perceptions. This constructive role that language plays in forming and communicating ideas has caused current researchers to examine the use of natural language in psychotherapy. Case grammar appears particularly well suited for this endeavor as its focus is how speakers communicate ideas with words. The related notion of how one speaker can influence another person's ideas by use of words has been the object of study for many contemporary psychotherapy researchers. To date, there is one case grammar study which addresses this issue.

In the most recent case grammar study of psychotherapy, researchers attempted to investigate the relationship between the therapist's stated goals and the language used in therapy (Meara, Pepinsky, Shannon and Murray, 1981). The data for this study were five minute excerpts taken from two different time periods in each interview in the film, Three Approaches to Psychotherapy. The dependent measures were verb phrases classified according to Cook's Matrix model of case grammar. This model posits three verb types: (1) states - verbs defining a particular noncausal relationship between persons and

things; (2) process - verbs defining a causal relationship without specifying an agent; (3) action - verbs defining a causal relationship and specifying an agent. Hypotheses concerning the therapists' verb usage were formulated in order to determine if a relationship existed between the therapist's speech in the interview and prior stated goals. It was hypothesized that Rogers would use the state verb type in his effort to establish a proper therapeutic climate. Perls was expected to use process verbs in his attempt to get the client to confront herself. It was hypothesized that Ellis would use a high degree of action verbs in his attempt to get the client to rethink her problems.

The results revealed the following percentages of verb usage for each therapist. Rogers used state verbs in 70% of his utterances, action verbs in 25% and process verbs in 5%. Perls used state verbs in 32% of his utterances, action verbs in 56% and process verbs in 12%. Ellis used state verbs in 40% of his utterances, action verbs in 51% and process verbs in 9%. The client used state verbs 60% of the time, action verbs 5% and process verbs 35%.

The hypothesis concerning Rogers and Ellis were unequivocally supported by the data. Rogers used predominantly state verbs and Ellis used predominantly action verbs. The hypothesis concerning Perls' verb usage was not supported by the data. The authors explained this by saying,

We may have been too greatly influenced (in formulating our hypothesis) by the outcome he wanted for the client and ignored the fact that he intended to take direct action to achieve that outcome (Meara et al., 1981, p. 116).

The authors conclude that the therapist's stated goals prior to a session do have an impact on the language behavior observed during that

session. They do warn, however, that not all language behavior occurring in a session can be accounted for by the therapist's goals. They suggest that the interactive behavior of the client and therapist is an important determinant of the language behavior exhibited in a session.

Meara's (1981) case grammar study of psychotherapy represents an important advance in the use of this approach. The two preceding studies were largely concerned with assessing the utility of a case grammar approach and developing a theory within which case grammar data are interpretable. The present study assumes that the preceding studies have proven the validity of this approach and that case grammar data are meaningful from the viewpoint of Patton's (1977) social-phenomenological model. Within this framework the authors address the question, "Do a therapist's prior stated goals have a determining effect on the language behavior exhibited in a psychotherapy session?" This represents a shift from studies validating the case grammar approach to studies in which the case grammar approach is used to investigate a fundamental aspect of the psychotherapeutic process. In making this shift, many important aspects of the psychotherapeutic process become amenable to a case grammar approach.

The case grammar approach does appear to have many potentially beneficial applications to the study of psychotherapy. It does, however, appear to have some limitations which it must overcome before it becomes a widely used research approach. Two of these limitations take the form of shortcomings of previous research; one takes the form of a methodological and theoretical dilemma.

The first of the two shortcomings of previous research is the

failure to examine entire therapy sessions. Previous case grammar research has usually examined five minute segments taken from two or three different time periods of a therapy session. This approach makes limited use of the wealth of information available in an entire session. It also runs the risk of misrepresenting or overlooking important variables. The second shortcoming of previous case grammar research has been the failure to examine the client-therapist interaction. The theory used to interpret case grammar research emphasizes the interactional aspects of therapy. It specifies that the verbal exchanges between client and therapist influence expectations and cause change (Patton et al., 1977). Despite such a theoretical orientation, previous research has been content to examine the case grammar usage of the client and the therapist isolated from each other. There has been no attempt to examine directly the case grammar usage of one participant as a deterministic affect on the other. Both of these limitations are easily overcome and pose no real problem for future case grammar research. There is, however, one limitation to the case grammar approach which may prove to be especially problematic. This problem concerns the utility of the case grammar approach when used to represent some important aspects of the psychotherapeutic process.

The utility of the case grammar approach to represent important psychotherapeutic variables such as rapport, transference, countertransference or resistance is questionable. These variables are thought of as the "intangibles" which make therapy more like an art form than a scientific endeavor. If a method for studying psychotherapy is to be considered viable it must be capable of representing and investigating these variables. Many researchers have tried to opera-

tionalize these intangibles but none has been unequivocally successful (Dittmann, 1950; Salansky, Isacs, Leviton and Hilgard, 1965). At this time there have been no attempts to study these factors using case grammar so the utility of this approach remains untested. The case grammar approach does hold some promise since its focus is upon how a person uses words to communicate ideas and expectations. This approach could delineate the relationship between observable variables (words) and the intangibles of therapy (e.g., rapport). The utility of this approach is, however, untested.

The case grammar study of psychotherapy is entering an exciting phase. It has developed from a linguistic theory (Filmore, 1968) to a substantial psychotherapy research approach (Bieber et al., 1977; Patton et al., 1977). It is currently being used to investigate some of the fundamental aspects of the psychotherapeutic process (Meara et al., 1981). Further investigation using this approach holds the promise of uncovering more of the fundamental relationships existing in the natural language of the client and therapist. Future research should be able to address increasingly complex issues.

#### The Obsessive-Compulsive Character

This section contains a review of the literature concerning the obsessive-compulsive character. First, the concept of character, or style, is reviewed. Then a discussion of the obsessive-compulsive character is presented. Special emphasis is given to the various aspects of the obsessive-compulsive's functioning, including perception, cognition, affect, interpersonal functioning and language behavior. The section concludes with a summary of the characteristics

of the obsessoid.

### The Concept of Character

Given the historical developments in the theory of character (Reich, 1933; Hartmann, 1958) and many years of clinical experience Shapiro (1965) developed his own theory of character style. Style is defined by Shapiro as a form or mode of functioning which an individual exhibits over a range of acts as a characteristic way of thinking, perceiving, experiencing and behaving. An individual's style is biologically based and is responsible for adaptive and defensive functioning. Thus, it determines not only an individual's manner of coping with stress but also his attitudes, interests, intellectual inclinations and even vocational aptitudes and social affinities.

The present study intends to make use of the concept of character style as presented by Shapiro. The role that this concept plays becomes evident as one considers the role of language in this study. Language is considered as an observable manifestation of an individual's cognitive and emotional status. This status is transient and as such fails to provide an overall picture of the individual. A larger more comprehensive system subsuming language, perception, experience and cognition must be used to fully describe the individual. Since style is the characteristic manner of experiencing, thinking, feeling and perceiving, then the proper context of an act is the individual style. Thus, character style provides the background to discuss and analyze the results of this study.

Before discussing the obsessive compulsive character one comment needs to be made concerning the compatibility of the two concepts,

psychtherapeutic process and character style. Both of these concepts share an essential aspect: the content of an action is irrelevant; the manner, or mode, of functioning is primary. In this sense both concepts occupy the same level of analysis. However, these two concepts differ in such a manner as to make them complementary. Character style refers to the process whereby an individual executes his daily functioning. Psychotherapeutic process refers to the intermingling of the styles of two or more people. Thus, the two concepts can be considered as separate but related tools in the armamentarium of the researcher and the practitioner.

#### The Obsessoid

The following is a review of the literature concerning the obsessive-compulsive character style. Included in the review is a discussion of the term "obsessive-compulsive character", the contemporary uses of the term and a description of how the style might be manifest. Special emphasis will be given to the functions of the obsessive-compulsive character including cognition, perception, affect and interpersonal style.

The concept of an obsessive-compulsive character is relatively new. For many years the obsessional character was seen as the premonitory state of the obsessive-compulsive neurotic (Ingram, 1961). It was not recognized that someone could have this style and not develop the neurosis. In contemporary nosology such allowances are made. With this development came a widening and loosening in the scope and use of the term. "Obsessional" is currently used in at least three senses: (1) a slang term; (2) a particular type of symptomatology; (3) a per-



sonality or character style (Ingram, 1961).

"Obsessional", used in its slang sense, is intended to be a term designating a personality classification. The term is often applied to a person on the basis of a single trait, e.g., cleanliness, orderliness or punctuality. The implication is that the classification, though based upon a single trait, is an accurate assessment of the personality. "Obsessional", used to designate symptomatology, is most often used in the context of describing obsessive-compulsive neuroses. In this neurosis a person suffers from obsessions and/or compulsions. In considering the many definitions of obsession and compulsion there is sufficient agreement among various authors to formulate the following definitions. An obsession is an unwanted, repetitive thought which forces itself insistently into consciousness and recurs against the conscious desires of the person. A compulsion is a morbid, intrusive, insistent and repetitive urge to perform some stereotyped act and goes contrary to the person's conscious wishes.

With respect to the obsessive-compulsive neurosis a recent review (Templer, 1972) summarizes the research findings as follows. It is a rather uncommon psychiatric disorder. The onset is usually sometime between childhood and early adulthood. First born and only children are especially prone to the disorder. There appears to be no appreciable sex predilection. The most common complication is depression. The obsessive-compulsive neurotic tends to be above average intelligence. The prognosis is not generally regarded as good.

"Obsessional", used to designate personality or character style, is the primary focus of this study. The term "obsessoid" will be used to refer to the concept of obsessional as it is used in this sense

(Caine, 1965).

The obsessoid personality can be considered an adaptive lifestyle (Ingram, 1961; Caine, 1965; Pollak, 1979). In fact, Honigmann (1967) argues that in Western cultures the obsessoid personality might be "the" dominant personality since it embodies so much of the general world view of the Protestant Work Ethic and capitalistic social and economic standards. Along the same line, Paykell and Prusoff (1973) suggest that many of the traits (e.g., perseverance, industriousness, ambition and self-control) characteristic of the obsessoid personality are highly regarded and rewarded in society. This serves to promote the possessor of these traits with a feeling of self-worth and acceptance thus providing the foundation for emotional stability.

The present study is not so much concerned with the problem-free functioning of the obsessoid, rather, the concern is with the obsessoid personality as it functions under stress, e.g., emotional or interpersonal problems. The following is a description of the obsessoid personality as it might manifest itself under stressful conditions. Included in this description are the following personality components: attention and perception, cognition, affect, behavior and interpersonal style.

The obsessoid's attentional capacity may be characterized as sharp and directed (Shapiro, 1965). The directedness of attention is maintained under continuous tension with great intensity and extreme narrowness of focus. The active restriction of attention prevents the obsessoid from considering new thoughts, thus, he avoids new points of view. Preoccupation with detail replaces recognition of and response to actual events. In this way events are not perceived directly or

with sensitivity or interest (Salzman, 1979).

The obsessoid's cognitive style may be characterized as rigid (Shapiro, 1965). He rarely gets hunches or creative thoughts. Thinking is usually intense but with a concrete quality which often gives way to rumination. The obsessoid relies heavily on intellect, often trying to think his way out of confusion and problems. This is the basis for his use of the defenses of intellectualization and rationalization (Maddi, 1976). Whatever intellectual ploy is used, it appears to have one or all of these objectives: (1) reduce confusion by dividing the problem into parts; (2) synthesize by reconciling opposites; (3) evolve general rules to live by (Berez, 1976).

The affective experience of the obsessoid has been characterized as constrictive, atrophied and in severe cases functionally nonexistent (Shapiro, 1965). It is constricted in the sense that technical details and irrelevant facts take the place of emotions. This leaves little room for true, heartfelt emotions. Affective atrophy ensues as a result of the obsessoid's inability to relax; relaxation is equated with loss of control. The obsessoid maintains his effortful, deliberate style at the expense of being able to nurture those areas of importance in emotional experience.

The obsessoid's behavior has the quality of drivenness (Shapiro, 1965). This drivenness results from an intense, almost moralistic, self-imposed pressure; the obsessoid is rarely driven by interest or enthusiasm. The self-imposed pressure often takes the form of, "I should". This reflects the obsessoid's basic interest in establishing a role to direct his behavior. The "shoulds" are derived from the obsessoid's reminding himself of his role. Ultimately, the obsessoid

restricts himself to activities which reflect his role and have a purpose. The possibility for spontaneous or playful activity is minimal.

The obsessoid's interpersonal style is characterized by "a pattern of noncommitment" (Angyal, 1973). The basis of this style is the obsessoid's inability to touch or be touched. Cognitive rigidity and concern for detail preclude the experience of anything substantial; the obsessoid is functionally out of touch with his own experience (Berez, 1976). Emotional atrophy occurs, bringing about an insensitivity to others. In general, the obsessoid is not affected by his interpersonal relationships. The overall affect is a self-created barrier which prevents the external world from having any direct impact.

The language habits of the obsessoid have been studied through many different approaches. The language habits of the obsessoid have been compared to other diagnostic categories. For example, one study compared oral (hysterical) and anal (obsessoid) characters on a verbal conditioning task (Timmons and Noblin, 1963). The results revealed that oral characters condition more rapidly than anal characters. The authors suggested that this implies that obsessoids maintain their self-esteem through obstinacy, and consequently are not easily conditioned.

The language habits of the obsessoid have also been studied by investigating verbal recall as a function of different types of obsessoid character (Fisher and Keen, 1972). Three types of obsessoid characters were identified: (1) anal retentive; (2) anal expulsive; and (3) undifferentiated anal character. The dependent variable was recall under two conditions, paired-associate and paragraph-recall. The results failed to support previous findings that anal retentives

had better recall (Adelson and Redmond, 1958). This study found no significant difference among the various types of obsessoid characters in their ability to recall verbal material. Evidently the various obsessoid characters do not differentiate on verbal recall ability.

In a recent study an attempt was made to characterize the obsessoid's interpersonal style of verbal communication (Johnson, 1976). The obsessoid was identified as having a switching style in which information was communicated clearly but then retracted or contrasted with contradictory information. The obsessoid's verbal style was studied under two conditions, stress and non-stress. Under non-stressful conditions, the obsessoid's style was characterized by a quick rate of speech, the use of explanations and retractions and a slight tendency to be evaluative. Under stressful conditions the obsessoid's rate of speech decreased; there was a decrease in personal reference and an increase in non-personal reference; there was an increase in evaluations and retractions and a decrease in feeling expressions. Regardless of stressful or non-stressful conditions, however, the obsessoid always maintained his switching style.

The overall picture of the obsessoid character is well developed. The obsessoid appears as having a penchant for detail but a rigid cognitive style which makes it difficult for him to be creative. The affective experience of the obsessoid has been described as constricted; the interpersonal style as noncommittal. Since contemporary society tends to reward some of the obsessoid's characteristics, this style has become increasingly prevalent. Along with the increased incidence of the obsessoid in the general population an increased number of clients with this style could be expected to show up in therapy. For this

reason it would behoove therapists to know as much as possible about the obsessoid.

### Psychotherapy Research Methodology

This section deals with the methodological issues of the present study. The methodology employed by the present study is the use of stochastic analyses in a single subject design with replication. This section begins with a discussion of the status of current psychotherapy research and the idiographic vs. nomothetic conflict. Next, the logic and the methodological issues of the single subject design are presented. Finally, the use of stochastic analyses in psychotherapy studies, particularly single subject designs, is discussed.

### Issues in Psychotherapy Research

The nature of current psychotherapy research was greatly influenced by three national conferences on research held in 1957, 1961 and 1966. From these conferences two influential researchers emerged as the spokesmen for the committee on psychotherapy research, Allen Bergin and Hans Strupp. In their final work for the research committee, (Bergin and Strupp, 1970), they set forth twenty conclusions based upon their findings and advocated that these conclusions delineate the direction of future psychotherapy research. The twenty conclusions can be condensed into three general categories: a) conclusions which call for a focus on the mechanism of change; b) conclusions which call for the use of experimental design appropriate to the questions under scrutiny; and c) conclusions which call for greater clarity and precision in theorizing. Of these three categories the category emphasizing the use of

appropriate experimental design addresses itself directly to the methodological issues of this study. Bergin and Strupp suggested that

no one can forecast future developments in as poorly developed a scientific discipline as psychotherapy, and significant increments in knowledge may come from quite unsuspected sources (p. 24).

This conclusion is in part a consequence of the fact that

among researchers as well as statisticians there is a growing disaffection from traditional experimental designs and statistical procedures which are held inappropriate to the subject matter under study (p. 25).

On the bases of the preceding conclusions, the authors suggested that

as for a general paradigm of inquiry, the individual experimental case study, and the experimental analogue approaches appear to be the primary strategies which will move us forward in our understanding of the mechanisms of change (p. 19).

The call for a research methodology compatible with the subject matter of psychotherapy actually predates Bergin and Strupp. Kiesler (1966) concluded that psychotherapy research suffers from disorganization, absence of a sophisticated and compatible methodology and absence of a sufficiently general research paradigm. He posits several "myths" of psychotherapy research which have caused researchers to adhere to existing methodologies thus forsaking more novel and appropriate approaches. These myths include (A) the uniformity assumption myth; (B) the myth that present theories provide adequate research paradigms; and (C) the myth that process and outcome studies are two distinct types. Each myth will be considered briefly as each has implications for this study.

The Uniformity Assumption Myth actually entails two erroneous assumptions. First, researchers using between groups designs have

assumed that "patients at the start of treatment are more alike than different." This assumption of homogeneity is actually unwarranted since in just about any measure one could devise (demographic, ability, personality, etc.) psychotherapy clients show a remarkable range of difference. If psychotherapy is differentially effective depending on initial patient differences, as the evidence strongly suggests, then it seems clear that researchers should take these differences into account and not assume them away. The second uniformity myth is the Therapist Uniformity Assumption. This myth ignores the growing body of evidence that psychotherapists are heterogeneous along many dimensions and that these differences seem to influence therapy outcome. The between groups design is inappropriate because the assumption of a homogeneous research condition, i.e., how therapy is conducted, cannot be substantiated.

The second general myth concerning psychotherapy research is the myth that present personality and psychotherapy theories provide adequate research paradigms. Kiesler (1966) suggests that the three prominent theories, Rogerian, Freudian and Behavioral, are not comprehensive in that they fail to explain known facts and variables of the empirical domain. He goes on to say that none of the three theoretical positions have precisely specified independent and dependent variables or dealt with the problems of quantity or quality of expected outcomes. This criticism provides a strong foundation for Bergin and Strupp's (1970) demand that research focus on technique building rather than testing traditional theory.

The third myth considered is that of the traditional distinction between process and outcome research. Kiesler (1966) states that this



distinction is unfortunate and misleading. It produces an odd dichotomy that the investigation of patient change is unconcerned with outcome and that investigation of patient outcome is not concerned with the mechanisms of change. Actually, to consider the process of change out of the context of outcome makes little sense and provides no basis for evaluation. By integrating these two types of research into one approach, the research can render valuable information to the practitioner.

Considering the recommendations offered by Bergin and Strupp (1970) and the limiting parameters elucidated by Kiesler (1966), an unequivocal and strong dictum for the use of the single subject design has emerged. Naturally, the references cited are not the only ones promulgating this view (Chassan, 1959; Shaprio, 1966; Leittenberg, 1973; Gottman, 1973). Despite strong methodological and logical arguments in favor of the single subject design, it has not been widely accepted or used. The reason for this hesitant stance can be traced to origin of the idiographic-nomothetic split.

Allport (1937) originated the terms, idiographic and nomothetic. He described the nomothetic approach as the accepted approach in psychology which relied upon group tests to develop general statements about the nature of man. Allport felt that this approach could not fully describe the uniqueness of the individual and therefore he posited an alternative approach which he dubbed "idiographic". The main purpose Allport had in developing this alternative was to broaden the legitimate scope of the subject matter of psychology. What actually ensued was psychologists taking sides and lines being drawn between idiographic and nomothetic proponents (Holt, 1965).

Attempts to reconcile the disparate views began after the conflict was well underway. Typical reconciliatory attempts tried to show how an idiographic approach might provide useful information for the scientific practice of psychology, i.e., the nomothetic approach. Falk (1956) is a good representative of this type of reconciliatory attempt. He first draws a distinction between the two approaches by stating that the idiographic approach can evince patterns of personalities and the nomothetic approach can quantify and generalize these patterns. Thus, for Falk and many others, the chief value of the idiographic approach was to delineate new variables and working hypotheses for use in the nomothetic (scientific) realm.

Marceil (1977) developed a convincing argument which circumvents the nomothetic-idiographic conflict and cleared the way for a more dispassionate evaluation of the single subject design. Marceil begins by saying that psychologists have made two major errors in discussing the nomothetic-idiographic conflict. First, they have misunderstood the intent of Allport's dichotomy. Second, psychologists have failed to differentiate methodological and theoretical issues of the nomothetic-idiographic distinction.

Marciel (1977) states that Allport's creation of the nomothetic-idiographic distinction was an attempt to preserve the telic qualities of his image of man. Nomothetic methods were just not doing a good job of representing man the way Allport conceptualized him. To remedy this, Allport urged the development of idiographic methods to highlight uniqueness and humanistic concepts. This is the point at which the issues become nebulous and the conflict arises. It appears that Allport was confusing theoretical and methodological considerations. In

so doing his intention to portray man in a telic form was tied to and obfuscated by demanding a specific methodology be used.

The research presented thus far makes a strong case for the use of the single subject design in psychotherapy research. Bergin and Strupp (1970) have pointed out that this approach is increasingly recommended by researchers and statisticians and that it is most likely to provide results which the practitioner could use. Keisler (1966) points out several "myths" of psychotherapy research which suggest that in psychotherapy research the traditional between groups design rests upon erroneous assumptions and fails to tie the mechanisms of change to the outcome of therapy. Finally, Marceil (1977) points out that use of a single subject design does not necessarily imply an idiographic view of man. Most importantly, Marceil (1977) separates the methodological and theoretical issues of the nomothetic-idiographic dichotomy allowing them to be considered separately. This distinction provides the basis for the next section in which the logic and design characteristics of the single subject design are discussed.

### Single Subject Designs

The preceding section made a case for the use of the single subject design in psychotherapy research. In presenting the arguments for its use, the single subject design may have taken on the appearance of a new, revolutionary design, however, a brief overview of the history of psychology and the development of experimental psychology reveals the single subject design is an old, established design.

Boring (1950) fixes the beginnings of experimental psychology in 1860 with the publication of Fechner's Elemente der Psychophysik.

Fechner was the first to apply statistical methods to psychological problems. He was concerned with variability within subjects and his research entailed a series of single subject designs. These traditions in methodology were carried on by Wundt and his students, most notably Titchener.

For Wundt the subject matter of psychology was immediate experience for which he created the method of introspection. This method always involved the intense study of a single subject. Titchener sustained the use of the single subject design in his research. Many of his experiments laid the ground work for the future study of sensation and perception.

Formost among single subject experiments has to be Ebbinghaus' investigation of memory. Called by some authorities "a landmark in the history of psychology...a model which will replay careful study" (Dukes, 1965, p. 74). The Ebbinghaus studies rank alongside those of Pavlov. What is often overlooked about Pavlov's studies, "is that Pavlov's basic findings were gleaned from single organisms and strengthened by replication on other organisms" (Hersen and Barlow, 1977, p. 5).

In psychotherapy research the single subject design was very much a factor from the very beginning. Consider Brever's case of Anna O. The analysis of this single case is credited with containing "the kernel of a new system of treatment" (Kikes, 1965, p. 75). Brever's colleague in this case was Freud, who later declared this case as seminal in the development of psychoanalysis.

There are other instances in the history and development of psychology which could attest to the importance of the single subject design, e.g. Estes, Skinner and Solman. It is, however, important to

point out that the single subject design is not a thing of the past. Although it has not enjoyed the popularity of a between groups design, it is currently an important and useful design.

Dukes (1965) surveyed the APS journals from 1939-1963 to find that 246 studies using single subject designs had been reported. He points out that

"although these 246 studies constitute only a small percent of the journal articles...the absolute number is noteworthy and is sizable enough to discount the notion that N=1 studies are a phenomenon of the past" (Dukes, 1965; p. 76).

Since Dukes (1965) article the frequency and the use of single subject designs has increased and currently there are two journals dedicated to the use of single subject design, Journal of Applied Behavioral Analysis and Journal of Experimental Analysis of Behavior.

The reason that the single subject design has not been widely used is twofold. First, the design rotates certain requirements based upon the characteristics of probability distributions. Second, the logic of the single subject design seems contrary to that of the between groups design. Both of these considerations are discussed below.

The most popular argument against the single subject design is that the results are not generalizable beyond the individual involved in the study. The criticism is of course correct. Single subject designs provide no estimate of population variability (i.e. the population from which the subject was selected), therefore, tests of significance have no basis for generalization to others (Edgington, 1967).

This is not the same as saying that the results of the study are not generalizable; only that tests of significance are not generalizable. Results may analyzed by means other than tests of significance. If the

analysis of the results is conducted by some means which doesn't rely upon standard probability distributions, then the results can be generalized within the context of subject characteristics and the design of the study. However, a test of significance in a single subject design may under no circumstances be generalized beyond the individual involved in the experiment. This restriction is valid and unalterable.

The second reason why single subject designs are not as ubiquitous as they could be is that the logic of the design seems inconsistent with that of the groups design. Actually, the logic of single subject design rests upon what may be considered the epitome of empirical epistemology: prediction and control. Single subject designs are constructed in such a manner that independent variables may be introduced and withdrawn and the effect of this manipulation can be directly observed in the dependent variables. In this design the experimenter can directly measure the effect of the independent variable under precisely defined conditions. As Chassan (1961) has stated:

Once a significant difference appears within a single case design, one can specify the particular patient background variables and other relevant characteristics in whose presence the significant result was obtained...This is in sharp contrast to the extensive model (between group design). Furthermore, in a design which is based upon a detailed statistical analysis of each case, each patient serves as his own control, and a statistically significant result cannot be an artifact of a lack of homogeneity of patients, or of poor pairing...The degree of control or anything near it is obviously impossible in the extensive model (Chassan, 1961; p. 46).

Considering the two objections discussed above, there is no substantive grounds on which one could reject the use of single subject designs. Since there is a problem with the generalizability of tests of significance beyond the individual, then one should eschew the use

use of tests of significance. These tests may still be used within the context of the design to compare the individual's performance during different phases of the experiment. The second objection concerning the logic of the study is also unfounded. The between groups design relies upon replicating its effect across many individuals and uses probability distributions to demonstrate that the effects did not occur by chance. The single subject design attempts exquisite control over the dependent variable by manipulating and carefully measuring the effect of these manipulations. The following section deals directly with the issue of data analysis in the single subject design.

In the past the supporters of the single case study in abnormal psychology have commonly preferred intuitive and subjective means of investigation, whereas those who believed in public and objective methods have usually been more concerned with studying group phenomenon (Inglis, 1966, p. 21).

The distinction, however, is no longer true and behavior modification research in particular has been successful in wedding the single subject design with rigorous statistical analyses (Liettenberg, 1973). It is important to note, however, that the statistical analyses appropriate for single case analyses are less familiar to most investigators because they are not the ones commonly taught in graduate statistics in psychology (Kazdin, 1978).

There are two major differences between traditional statistics and those frequently used in single subject designs. First, in a single subject design the data usually contains dependence since it is produced by one subject. The statistics in a single subject design take advantage of this dependence and are highly sensitive to it. Typical statistics used include auto-correlation, stochastic analysis and time series analysis. Each of these statistical procedures assumes a certain

amount of dependence in the data and in fact these analyses won't work unless the data is dependent (Sidman, 1960). The difference between traditional and single subject designs is reducible to a difference in probability models. The former is a static probability model, whereas the latter is a dynamic probability model (Miller, 1950).

The second difference between traditional statistics and those frequently used in single subject designs is the use of tests for statistical significance. The statistics used in single subject designs do not necessarily rely on a test for statistical significance. This is fortunate given the demands placed upon sampling which are necessary to generalized statistical significance. Single subject designs often employ statistics in an attempt to develop a probabilistic model of the data. In this effort a test for statistical significance is inappropriate. Rather, various probabilistic models are fitted to the data. The key question is to determine if the model of the Baseline segment is the same model which describes the Intervention segment (Henson and Barlow, 1977).

In summary, the single subject design is the traditional experimental design of psychology research and is currently experiencing a resurgence in contemporary psychology research. The popular criticism leveled at the single subject design for its lack of generality is correct but it is not a substantial obstacle precluding the use of the design. The logic used to make generalizations in large N research is different from the logic which permits generalizing results from single subject designs. Finally, the statistics used in single subject designs are different from traditional statistics and appropriate for the type of data produced by single subject designs. This topic of data



analyses is the focus of the next section.

### Stochastic Analyses in Psychotherapy Research

As indicated in the previous section, the data produced by the single subject design is normally not amenable to traditional statistical analysis. There are two reasons for this. First, there is dependence in the data since it is produced by a single subject. Second, there is no estimate of population variation, i.e. the population from which the individual was selected). Although traditional statistics can not be used in the single subject design, a rigorous statistical analysis of the data is possible. This section will discuss the type of analysis, stochastic analysis, which is used in the present study. First, a discussion of stochastic analyses will be presented. Next, examples of the use of stochastic analyses in psychotherapy research will be provided. Finally, the calculations utilized in the data analysis of the present study will be discussed.

Parzen (1962) has defined a stochastic process as follows:

The theory of stochastic process is generally defined as the 'dynamic' part of probability theory, in which one studies a collection of random variables from the point of view of their interdependence and limiting behavior. One is observing a stochastic process whenever one examines a process developing in time in a manner controlled by probabilistic laws (p. 5).

In the definition given above the 'dynamic' and time dependent characteristics of stochastic analyses are emphasized. This emphasis reveals an aspect of a stochastic analysis different from that specified in more traditional analyses. Whereas traditional statistical analyses are concerned with frequency of a variable's occurrence, stochastic analyses are concerned with frequency of transitions between

states (Hertel, 1972). The emphasis upon transitions is how the stochastic analysis captures the 'dynamic' aspects of the process as it unfolds over time.

In a stochastic process, the variables of interest are called states. The probability associated with moving from one state to another is called a transitional probability. A specific sequence of states determined by a specifiable probability is referred to as a Markov chain. The Markov chain is useful in that it can supply a probabilistic record of the serial transitions for a specified point in time (Hertel, 1972). In large time segments the transition probabilities can be summarized and represented by a transition matrix. A transition matrix is a matrix which has antecedent states comprising its rows and consequent states comprising the columns (Benjamin, 1979). The cells are filled with the frequency with which an antecedent state leads to a consequence state. The problem that is of most interest in a stochastic analysis is determining which state the chain will be in a given time (Kemeny, Snell and Thompson, 1961). The probability of being in a specified state, 'a', at a specified time, n, is the probability of being at all possible states at time n-1 and then moving to state 'a' at time n (Kemeny et al., 1961). In order to obtain the probability of being in state 'a' at time n, matrix algebra specifies the following function

$$p^n = p^o p^{n-1}$$

where  $p^n$  = matrix of state probabilities at time n.  
 $p^o$  = initial probability vector; the probability that a chain will start off in a specified state.  
 $p^{n-1}$  = the transition matrix at time n-1.

In the formula given above time 'n' is actually the power of the matrix. By raising the power of the matrix the probability that the process will be in a given state at a specified time can be obtained. For example, by taking the transition matrix, P and raising it to the second power  $P^2$ , the resulting matrix contains the two step transition probabilities for time,  $n = 2$ . If the matrix is raised by successive powers eventually each row of the matrix will be comprised of the same values. This vector of values which appears in all rows of the matrix is called the fixed point probability vector. It represents the asymptotic probability that the chain will be in a given state at some undetermined point in the future (Atkinson, Bower, and Cruthers, 1965). It can also be considered the absolute transition probabilities of a Markov chain when time approaches infinity,  $n \cong \infty$ .

As with traditional statistics, there are certain assumptions which must be met prior to conducting a stochastic analysis. The two assumptions are the assumption of stationarity and the assumption of order of dependence. The stationarity assumption is an assumption of homogeneity of transition probabilities. Formally stated, this assumption specifies that the transition probabilities of the Markov chain are independent of time (Kemeny et al., 1961). That is, the transition probabilities associated with the Markov chain in one time segment are the same as the transition probabilities for any other time segment. This permits an entire process to be described by a single set of probabilities. Violation of this assumption does not mean that the process is not stochastic; it suggests that the process is a complex stochastic process with heterogeneous transition probabilities (Benjamin, 1979).

The second assumption is the assumption of the order of dependence. Formally stated, this assumption specifies that the state of the chain at time  $n$  is dependent upon the state of the chain at time  $n-1$ , and no other time. If a Markov chain meets this assumption, then the chain is a first order chain (Atkinson et al., 1965). A first order chain is essentially ahistoric. That is, the state of the chain at time  $n$  is determined by the state of the chain at time  $n-1$  but not by the state of the chain at time  $n-2$ ,  $n-3$ ,  $n-4$ , etc. The order of the chain can be increased as the number of preceding states determining the state at time  $n$  increases. For example, if the states at time  $n-2$  and  $n-1$  determine the state at time  $n$ , then the chain is a second order chain. Consequently, violations of the order assumption do not preclude stochastic analysis, they suggest that the dependency of the chain is more complex and this must be accounted for in the interpretation (Benjamin, 1979).

One of the earliest proponents for the use of stochastic analysis in psychotherapy research was J. B. Chassan (1957). Chassan argued for the use of an experimental design involving single subject research projects in which the analysis is conducted by use of stochastic analysis. Chassan's comments concerning the single subject design were discussed earlier. His arguments favoring stochastic analysis will provide a good starting point for discussion of the use of stochastic analysis in psychotherapy research.

Chassan's support for stochastic analysis rests on his contention that

unless the probabilistic aspects of patient-states themselves are considered along with the variability between patients, gross misinterpretation of sets of observations will result (p. 163).

For this reason, Chassan argued against relying exclusively upon traditional tests of statistical significance which fail to specify which patients improved and what factors were pertinent to the patient's improvement (Chassan, 1961). By use of stochastic analysis, clinical research can represent the psychotherapy in a manner which is meaningful for the clinical practitioner. Specifically, the patient can be described in terms of a multivariate probability distribution which reflects the psychologist's multi-dimensional, complex picture of the patient. Chassan (1957) suggests that the application of statistical analysis to the variability of a single patient's behavior is a logical extension of psychology's established practice of statistical analysis of variability between patients.

Jaffe and Feldstien (1970) developed Chassan's use of stochastic analysis by applying it to the interpersonal features of communication in therapy. Whereas Chassan was concerned with the variability of patient states (e.g., symptoms), Jaffe and Feldstein were concerned with the variability of verbal communications between the client and therapist. Like Chassan, Jaffe and Feldstein considered the variability to be 'lawful' and consequently capable of probabilistic description through stochastic analysis.

Jaffe and Feldstein (1970) were mainly concerned with developing a model of therapist-client turn taking in psychotherapy. In an attempt to describe this interaction they specified a Markov model with three states: (1) client and therapist talking simultaneously, (2) client verbalizing; (3) therapist verbalizing. The analysis revealed that a single dyadic factor could not account for the turn taking. A double factor model emphasizing the independent probabilities

for client and therapist verbalizations was found to provide the most accurate description of turn taking. In their recommendations for future research the authors suggested that conventional statistical tests can be used to determine if a given model fits the data in a matrix. They do issue a caveat to not confuse 'statistical significance' with 'meaningful difference'. They suggest that a meaningful difference can be obtained by comparing the efficiency with which competing stochastic models describe the obtained data. This notion of competing stochastic models is the basis for determining the order of the Markov chain in the present study and in other previous studies (Anderson, 1974).

Hertel (1972) presents a cogent argument for the use of stochastic analysis to describe the verbal interactions of the client and therapist. He contends that Parzen's (1962) description of a stochastic process is tantamount to what most psychologists consider the psychotherapeutic process:

The sequence of statements emitted by patient and therapist would seem to qualify as a 'collection of random variables' that may be studied 'from the point of view of their interdependence and limiting behavior' (Hertel, 1972, p. 424).

Hertel illuminates more of the similarity between a stochastic process and the psychotherapeutic process by noting that strategies of utilizing consistencies in sequential patterning have been used by therapists for a long time. The therapist essentially observes a word by word stream of events emitted by the client. As the client and therapist continue to interact certain patternings of words and ideas begin to emerge. "As these patterns are diagnosed the therapist embarks upon a pattern of interaction with the patient...which will hopefully modify the original

behavioral configuration" (Hertel, 1972, p. 428). The therapist then evaluates the successfulness of his interventions by noting change in the targeted verbal sequencing.

Benjamin (1979) developed a model of interpersonal interaction in terms of focus (other, self, or introjection) affiliation, interdependence, and topic. She applied this model to segments of psychotherapy sessions which were crucial to therapeutic movement. She called these segments 'critical incidents'. In her analysis she found that a Markov model captured the essential features of the critical incident and presented it in a manner consistent with the "intuition of the expert clinician". Like Hertel, she contends that psychotherapists

have long emphasized the importance of sequence in understanding normal and pathological process... (and) an appropriate mathematical tool for studying the sequence is Markov chain analysis (Benjamin, 1979, p. 310).

An interesting development from the Benjamin (1979) study was the four-way analysis of the verbal behavior of the client and therapist. Using one critical incident Benjamin found it possible to look at the following four aspects: (1) the client's monologue; (2) the therapist's monologue; (3) the dialogue on which the client is the "sender" and the therapist is the "receiver"; (4) the dialogue in which the therapist is the sender and the client is the receiver. This development represents the most recent step in the evolution of the application of stochastic analyses to clinical problems. Chassan's (1959) use of stochastic analysis was restricted to the intraindividual variability of patient states (e.g., symptoms). From this level of analysis Jaffe and Feldstein (1970) developed the notion that the nonverbal interpersonal aspects of therapy could be represented stochastically. Hertel (1972) developed the notion that the verbal, interpersonal aspects in therapy

could be represented stochastically and that this representation mirrored what therapists refer to as the psychotherapeutic process. Benjamin (1979) corroborated Hertel's notion and specified four aspects of the dyadic interaction which may be subjected to stochastic analysis.

The four authors discussed hitherto were largely concerned with the rational and philosophical aspects of representing clinical phenomena by stochastic analyses. Absent in their work are the computations for undertaking a stochastic analysis. An early work by Katz and Proctor (1959) provides guidelines for the use of the Chi-Square in a stochastic analysis. The authors outline a four step procedure: (1) establish the fact that there is dependence in the data; (2) establish the fact that there is stationarity of transition probabilities; (3) determine the order of the chain; (4) specify the model. Note that in these four steps that the assumptions of stationarity and order of the chain comprise an integral part of the analysis. The manner in which the Chi-Square is used in each of these steps is discussed in the statement of the problem.

#### Statement of the Problem and Statistical Hypotheses

The purpose of the present study is to investigate the effect of three psychotherapeutic interventions on the case relation usage of two obsessoid clients. It is assumed that by altering the case grammar habits of the client that cognitive, behavioral and experimental change will occur (Rudestam, 1979). The three case relations targeted for change are hypothesized to represent maladaptive aspects of the client's character. The interventions will attempt to increase the client's use



of the Experiencer case relation and decrease the client's use of the Modal and Universal case relations. The relationship between these case relations and the obsessoid's functioning is discussed below.

The Experiencer case relation is used when a speaker makes reference to the affective component of experience. It is used to talk about feelings and emotions of self or others. The obsessoid's affective experience is generally described as constricted and neglected (Berez, 1976). Hence, the obsessoid would be expected to avoid using the Experiencer case relation. One of the interventions in the present study is designed to increase the use of the Experiencer case relation. The goal of this intervention is to increase the client's awareness and use of the affective component of his experience.

The Universal case relation is used when a speaker states a generalization. Generalizations have been identified as problematic since they ignore the nuances of experience, causing alternatives and solutions to problems to become obscured (Bandler and Grinder, 1975). The obsessoid's penchant for intellectual defenses makes him a prime candidate for the overuse and abuse of generalizations (Shapiro, 1965). One of the interventions specified in the present study is designed to decrease the client's use of the Universal case relation. The goal of this intervention is to eliminate generalizations so that the client can use the nuances of his experience to develop solutions to his problems.

The Modal case relation is used when a speaker wants to put "psychological distance" between himself and his utterance. Its use reflects a speaker's doubt, tentativeness and conditionality (Rudestam, 1979). The obsessoid client would be expected to use the Modal case

given his tentative, equivocating approach to life (Salzman, 1979). This use of Modals would be expected to be especially prominent as the obsessoid discusses his emotional life. One intervention specified by the present study is designed to decrease the client's use of the Modal case relation. The goal of this intervention is to permit the client to speak without putting psychological distance between himself and his statement. In this way the client can claim responsibility for his statements and actions. Being responsible will put the client in control of his experience, enabling him to make choices concerning his behavior.

In addition to the changes in case grammar usage due to the interventions, the case grammar usage of the client and therapist are expected to change as a result of convergence. Convergence is defined as an increased similarity in case relation usage by the client and therapist. Convergence is expected to occur from the Baseline to the Intervention segment.

In an effort to generate a probabilistic model of the effects of the interventions and the occurrence of convergence, a Markov chain to describe the data will be developed. The calculations used to derive this Markov chain will be Anderson's (1974) modified version of Katz and Proctor's (1959) stochastic analysis procedure. The procedure employed entails three steps: (1) Determine the order of the chain<sup>1</sup> -

---

<sup>1</sup>The Chi-Square is used as a test of independence. The larger the Chi-Square, the more dependence accounted for by the chain. The Chi-Square can also be thought of as a goodness-of-fit test. In this case the Chi-Square for a first order Markov chain would be a goodness-of-fit test of a Bernoulli process. The Chi-Square for the second order Markov chain would be a goodness-of-fit test for the first order Markov process. Using the goodness-of-fit approach, a third Chi-Square would have to be calculated to determine the merits of a second order chain.

a Chi-Square is calculated for the first and second order Markov chains. Each Chi-Square is divided by its degrees of freedom. The order of the Markov chain with the larger Chi-Square/Degrees of Freedom ratio is the Markov chain used to describe the data. The Chi-Square used in this manner is best thought of as a test for independence (Katz and Proctor, 1959). A small Chi-Square indicates that the model does a poor job of describing the dependency in the data. A large Chi-Square indicates that the model does a good job of describing the data. In this study, large and small Chi-Squares are determined on a relative basis by comparing the Chi-Square/Degrees of Freedom ratios for first and second order Markov chains describing the same data; (2) Determine stationarity - stationarity will be evaluated by calculating a Chi-Square comparing the frequency of transitions for the first half on a psychotherapy session to the second half of the session. Stationarity is determined by a nonsignificant Chi-Square statistic, i.e., the transition in the first half do not differ from those in the second half. A non-stationarity process is determined by a significant Chi-Square statistic, i.e., transitions differ from one half of the interview to the next; (3) Determine the Markov model for the data - assuming that stationarity exists, and the order of the Markov chain has been determined, the Markov model can be derived. In order to determine the Markov model, calculate the row percentages for all the cells of the matrix used to represent the order of the chain. This will result in a matrix in which every cell contains a percentage. These percentages are the transition probabilities for the data. This matrix represents the Markov model of the data.

The present study will use a single subject design with replica-

tion. The type of design employed is a Time Lag Design (Gottmann, 1973). In this design there are two separate experiments each with a Baseline and an Intervention segment. The Baseline segment is the time during which the independent variable is withheld. The Intervention segment is the time during which the independent variable is applied. In the present study the interventions serve as the independent variable. The Baseline segment is comprised of the therapy session in which the therapist does not use the interventions. The Intervention segment is comprised of the therapy sessions in which the interventions are applied. In order to achieve a Time Lag Design, two separate experiments of six therapy sessions each will be conducted. In Experiment One, the Baseline is comprised of sessions 1 and 2. In Experiment Two, the Baseline is comprised of session 1, 2 and 3. If the interventions are effective, then in Experiment One there should be a change in the client's case relation usage after the second session. In Experiment Two the change in case relation usage should come after the third session.

On the basis of the expected changes in the client's case grammar usage, statistical hypotheses can be formulated concerning the effect of the interventions and the occurrence of convergence. The following is a list of these hypotheses.

#### Descriptive Statistics

##### Case Relation Usage

Hypothesis 1: the client's percentage of use of the Experiencer case relation will increase during the Intervention segment.

Hypothesis 2: The client's percentage of use of the Modal case relation will decrease during the Intervention segment.

Hypothesis 3: The client's percentage of use of the Universal case relation will decrease during the Intervention segment.

### Convergence

Hypothesis 4: The differences between the client and therapist percentage of case relation usage for the Experiencer, Modal, and Universal case relations will diminish from the Baseline to the Intervention segment.

Hypothesis 5: The change in the client and therapist percentage of case relation usage will be consistent with the hypothesis. That is, the client and therapist percent usage of the Experiencer case relation will increase and their percent usage of the Modal and Universal case relations will decrease.

### Stochastic Analyses

### Case Relation Usage

Hypothesis 6: The transition probabilities representing the client's use of the Pathological<sup>2</sup> case relation category as an antecedent state, (i.e. Agentive → Pathological, Instrumental → Pathological, and Pathological → Pathological), will decrease during the Intervention segment.

Hypothesis 7: The fixed point probability, or asymptotic probability, for the Pathological case relation category will decrease during the Intervention segment.

---

<sup>2</sup>The term "Pathological case relation category" refers to the combination of the Modal and Universal case relations to form a case category. These two case relations are combined on the basis that: (a) they are both maladaptive case relations; and (b) they are both targeted for reduction. The necessity of using case categories, as opposed to case relations, is covered explicitly in Chapter III.

### Convergence

Hypothesis 8: The differences between the client and therapist transition probabilities, for the same transition, will diminish during the intervention segment.

Hypothesis 9: The differences between the client's and therapist's fixed point probabilities, or asymptotic probabilities, will diminish during the Intervention segment.

The methodology and statistical analysis utilized by this study are designed to be sensitive to the hypothesized effects of the interventions. The findings of this study will have important implications for further research with this type of design and for the use of case grammar variables. It is expected that the results will reveal important and fundamental aspects of the verbal interaction occurring in therapy.

## CHAPTER III

### METHODOLOGY

#### Subjects

Four participants were involved in the study, two therapists and two clients. Two client-therapist pairs were formed with each pair comprising a separate experiment.

The therapist in Experiment One was a 26 year old, white female in her third year of an APA Clinical Psychology program. The therapist had two and a half years of practicum experience and was working in a university counseling center at the time she participated in the study. She was also working on her Master's thesis and taking course work at the time of the study. She had already attained a Master's Degree in Developmental Psychology. Her participation in the study was voluntary. She received no university credits or any monetary reimbursement. She described her therapy orientation as eclectic but predominantly Rogerian.

The therapist in Experiment Two was a 25 year old, white female in her third year of an APA approved program in Clinical Psychology. The therapist had two and a half years of practicum experience and was working in a university counseling center at the time she participated in the study. She was also taking course work and working on her Master's thesis. Her participation in the study was voluntary. She

received no university credit or monetary reimbursement. She described her therapy style as eclectic but predominantly Rogerian.

The two clients involved in the study were male, self-referred clients. The clients were selected on the basis of their scores on the Hysteroid-Obsessoid Questionnaire. The scores the clients obtained indicated that they could be diagnosed as having an obsessive-compulsive character. Both clients gave written consent to participate in the study and to have six sessions recorded and transcribed. After completing six sessions each client was debriefed. Both clients continued in therapy past the sixth session. Copies of consent forms and debriefing may be found in Appendix C.

The client in Experiment One was a 34 year old, divorced, white male who had obtained a score of 16 on the Hysteroid-Obsessoid Questionnaire. Scores of 19 and below indicate that the person has an obsessoid character. The client was a Vietnam veteran who had seen limited combat duty. After an Honorable Discharge the client attended a university and earned a B.A. in Sociology. He had worked in a nursing home and on an assembly line in a factory. At the time he participated in this study he was working as an orderly in a hospital. His presenting problem for this therapy contact concerned problems which developed after the recent termination of a relationship. This client had been seen off and on in therapy for the past four years.

The client in Experiment Two was a 36 year old white male who had obtained a score of 14 on the Hysteroid-Obsessoid Questionnaire. This score clearly indicates the client has an obsessoid character. The client had a B.A. in Business from a university and worked in several small business operations since obtaining his degree. At the time of



the study the client was working as a representative for a business machine company. He had maintained this position for four years. His presenting problem for this therapy contact concerned problems which developed as a result of his nine month old marriage. During the course of treatment his wife filed for divorce. This therapy contact was the client's first.

### Instrumentation

#### The Hysteroid-Obsessoid Questionnaire (HOQ)

The HOQ is a 48-item questionnaire designed to measure the hysteroid-obsessoid dimension of personality (see Appendix B). It is sensitive to trait or personality as opposed to state, symptom or psychopathology. Score range is from 0-48. A score of 19 or below designates obsessoid functioning. A score of 27 or above indicates hysteroid functioning. The HOQ was originally validated on 98 subjects over an 18-month period at a private psychiatric clinic (Caine and Hawkins, 1963). It obtained a test-retest reliability of .77. A correlation of .68 was obtained between the HOQ and clinical rating of personality. The HOQ has also been used in the university setting (Berez, 1976; Hobby, 1978). Validation studies for the HOQ on a university population reveal that it has a test-retest reliability of .80 and a correlation of .78 with clinical ratings of personality (Berez, 1965).

#### Computer Assisted Language Analysis System

##### (CALAS)

CALAS is comprised of a set of programs for analyzing the texts of discourse in the English language. A first subset of programs makes a

word for word translation of a given test into its grammatical counterparts (e.g., noun, verb, adjective, adverb); a second set of sub-programs aggregates the individual terms into phrases (e.g., noun phrases, verb phrases, adverbial phrases, prepositional phrases); a third set of sub-programs aggregates the phrases into clauses (e.g., main and subordinate); and a fourth subset identifies the phrases within a clause by giving them particular structural designations (e.g., case relations).

### Transcription

All therapy sessions were recorded by means of an audiotape recorder located in the therapy room. Different recorders were used depending on which therapy room the session was held in. The overall quality of the tapes was good enough to permit verbatim transcripts to be made. Since speakers of any language rarely speak in completely grammatical, nonoverlapping sentences, it was necessary to employ an established technique to divide the interview into sentences (Auld and White, 1956). This technique identified sentences to be classified by the scoring procedure (see Appendix D).

### Scoring Procedure

Every main verb of every independent or dependent clause in the interview was coded as one of the seven possible case relations: universal, modal, experiencer, agentive, instrumental, objective or stative. These seven categories represent a comprehensive scoring system of mutually exclusive categories. A scoring hierarchy was established to avoid classifying a sentence by more than one case rela-

tion. If a sentence appeared to be classifiable by two cases, then the case at the top of the hierarchy took precedence and the phrase was classified by this case. There was only one case assigned to the main verb of every dependent and independent clause. The scoring hierarchy is as follows: modal, universal, instrumental, experiencer, objective, agentive and stative. This hierarchy was determined by the experimenter in order to ensure that universal, modal and experiencer case relations had the greatest opportunity of being detected. There are the three case relations targeted for change by the interventions specified in the present study. Thus, the scoring hierarchy is most sensitive to these cases. The following is a list of each case relation presented in hierarchical order. Definitions and examples are included.

#### Case Relations

A. Modal - the case of a verb used to modify or qualify another verb, e.g., can, have to, may, must, ought, shall, should, will and would.

I ought to run those errands.

One could become angry.

The use of the Modal has the effect of creating "psychological distance". That is, this case relation obscures who is responsible for an action because it implies an imperative. The imperative directs the action specified by the verb so the speaker cannot be held responsible for the action. After all, he was only following the imperative (Rudestam, 1979).

B. Universal - the case of a verb referring to or affecting all

members of a class or group.

Everyone is doing it.

She always cries when talking.

Since universal statements are rarely true, this case relation represents a manoeuvre whereby the speaker misrepresents and impoverishes his world view (Bandler and Grinder, 1975).

C. Instrumental - the case of the inanimate being the instigator of the action.

The key opened the door.

The rocks rolled down the hill.

This case relation assigns the role of initiator to an inanimate object. Although this is certainly the situation sometimes, this case relation can be used to erroneously assign the role of initiator to an inanimate object. When this is done the speaker is saying that he views things in his world as beyond control.

D. Experiencer - the case of the animate being affected by the state or action identified by the verb.

John felt bad.

John believed them.

This case relation is very pertinent to therapy. It is the case relation which specifies that either the therapist or client is dealing with emotions.

E. Objective - the case of the inanimate as the receiver of the action identified by the verb.

The chair fell over.

The train stopped short.

This case relation can be used to relate simple facts. It also repre-

sents a rather passive view in which animate objects are not seen as instigators or recipients of actions.

F. Agentive - the case of the animate being the instigator of the action.

John ran.

John started the fire.

This case relation is used to convey facts about what people do. It represents a view of the world in which people are active and responsible.

G. Stative - any form of the verb "to be" used in conjunction with a noun phrase.

John was the man.

It was very stylish.

This case relation can be used to talk about existing states. It denotes a static view in which there is no initiator and no change in the state.

#### Case Relation Categories

The seven case relations were combined into three case relation categories to facilitate the stochastic analysis. Using three case relation categories rather than seven case relation categories resulted in a three states Markov chain as opposed to a seven state chain. This meant that only nine parameters ( $3^2$ ), instead of forty-nine ( $7^2$ ), had to be estimated. This reduction in states of the Markov chain resulted in more efficient parameter estimation. The following is a list of the three case relation categories used in the stochastic analysis. Note that each category is formed by combining two or more of the

aforementioned case relations.

A. Pathological Category - a combination of the Universal and Modal case relations based upon the fact that both of these case relations are targeted for reduction by the interventions of the present study. The category is called pathological because it is assumed that these two case relations are the linguistic representations of the way the obsessoid distorts his experience and causes himself to have problems. In eliminating these pathological case relations, their distorting influences are assumed to also be eliminated (Rudestam, 1979). Although separate interventions for the Universal and Modal case relations are specified, the interventions are designed to reduce the frequency with which both are used. Changes in the use of this case relation category are assumed to reflect the overall effectiveness of the interventions.

B. Agentive Category - a combination of the Agentive and Experienter case relations based upon the fact that both case relations involve an animate noun being the instigator or recipient of an action. The use of the animate noun represents the speaker's notion that someone has done something or something has happened to someone. The underlying commonality is that people are perceived as actively doing or feeling. This suggests that the speaker perceives people as responsible for their actions and feelings.

C. Instrumental Category - a combination of the Instrumental, Objective and Stative case relations based upon the fact that the entail an unidentified or inanimate noun as the initiator or receiver of an action. This use of the inanimate obscurs cause-effect relationships or assigns responsibility for an act to inanimate nouns. This

category preempts individuals from taking responsibility for actions and suggests that the action is outside the realm of control of the speaker. Although some use of this category is normal and to be expected, predominant use of this category would suggest that the individual experiences the world as uncontrollable and overwhelming.

### Procedure

Each experiment consisted of six sessions. In Experiment One the client and the therapist met for two sessions and then the therapist was trained. The two sessions before the therapist's training served as the Baseline segment. The four sessions after training served as the Intervention segment. In Experiment Two the client and therapist met for three sessions and then the therapist was trained. The three sessions prior to therapist training served as the Baseline segment. The three sessions after training served as the Intervention segment. The therapists were trained separately. In both experiments the therapists were told to use their typical therapy style for the Baseline segment. During the entire experiment both therapists were supervised by a Ph.D. clinical psychologist on the faculty. Each therapist had a different supervisor.

After recording all sessions using an audiotape recorder and transcribing verbatim, Auld and White's (1956) rules for dividing interviews into sentences was used to identify the sentences to be coded. The sentences of the transcribed sessions were coded by CALAS, which was programmed to use the hierarchical case relation scoring system. Descriptive statistics for the coded transcripts were calculated. Then

the data were subjected to a stochastic analysis.

### Therapist Training

All training occurred between the last baseline session and the first session in which the interventions were used. The therapists were not trained together. Training consisted of three sessions held on three different days. The training schedule was devised with the intention of first familiarizing the therapist with the interventions and then allowing the therapist to use the interventions in a controlled setting.

The first training session was held the first day after the last baseline session. It was primarily an instructional session. The therapist was informed of the goals and hypotheses of the study. Then the experimenter explained the concepts of case grammar and case relations. The material for this part of the instruction was taken from the literature review and methodology of the present study. The case relations that the therapists were taught were the seven case relations specified in the methodology. Special emphasis was placed on the therapist's recognition and understanding of the three case relations targeted for change. In an effort to familiarize the therapist with the occurrence of case relations in therapy, the experimenter identified the client and therapist usage of case relations in a portion of a therapy transcript. Then the therapist was introduced to the interventions to be used. At this point, the experimenter answered any questions the therapist had. At the end of the session, the therapist was given sections of the text of the present study pertaining to case grammar, case relations and the interventions. The therapist was



instructed to read this material and prepare a list of questions so that the experimenter could answer them and clear up any ambiguities or confusion.

The second training session took place the day after the first training session. The experimenter began by answering questions the therapist had concerning the reading material. After all the questions had been dispensed with, the experimenter presented the therapist with a therapy transcript. The therapist's job was to code each sentence as one of the possible case relations. After the therapist had completed this task, the experimenter checked the scoring. Errors in scoring were corrected and discussed. Afterwards, the therapist and client engaged in 30 minutes of role playing so that the therapist could practice using the interventions. For the first 15 minutes of role play, the experimenter took the "therapist-role" and the therapist took the "client-role." The purpose of this part of the role playing was for the experimenter to model the interventions and for the therapist to begin consciously recognizing case relations in her speech. In the next 15 minutes of role play, the experimenter and the therapist switched roles. Then the therapist had her first opportunity to use the therapeutic interventions. The experimenter supplied the therapist with continuous feedback during this part of the session. After the role playing was finished, the experimenter answered questions posed by the therapist.

The third training session took place two days after the second training session. This was the final training session for the therapist, and consisted of the experimenter and therapist engaging in role play again, with the experimenter taking the "client-role" and the

therapist the "therapist-role." The role playing was audio-recorded. In the course of role playing the experimenter talked in such a manner as to create situations where the use of the specified interventions was appropriate. After 30 minutes of role playing, the experimenter and therapist reviewed the tape. Correct usage of the interventions, mistakes and omissions were pointed out and discussed. The experimenter answered any questions posed by the therapist and then the session was terminated. There were no criteria for the therapists to reach prior to the termination of training. Both therapists exhibited a good understanding of the concepts and interventions during training. Both therapists stated that they were satisfied with their training and comfortable with the techniques.

During the Intervention segment, the therapeutic interventions in which the therapist had been trained were used in conjunction with the techniques the therapist normally employed. That is, the therapist was instructed to use the specified interventions each and every time their application was appropriate. When one of the specified interventions was not called for, then the therapist was to maintain her typical style. The therapists were the ones who determined if an intervention was necessary. Thus, the specified interventions were used only when the therapist deemed them appropriate and in conjunction with the therapist's customary interventions.

#### Therapeutic Interventions

Interventions will be stated in terms of case grammar. The aim of the interventions was to alter the case grammar habits in a therapeutic manner. The approach is based on the notion that when clients experiment

with their linguistic habits, then cognitive, affective and behavioral changes ensue (Rudestam, 1978). The following is a list of the three interventions to be used in the present study:

1. Increasing the use of the Experiencer Case Relation - In an effort to get the obsessoid to recognize and use the affective components of his experience, the therapist must make the obsessoid aware that he is ignoring his feelings and make the obsessoid talk about them (Salzman, 1979). The case relation which pertains to the affective component of experience is called the Experiencer case. When a therapist initiates an exchange which calls for the obsessoid to respond with statement about his feelings, a response in the experiencer case, the obsessoid often fails to do so. For example,

<u>Therapist</u>	<u>Client</u>
Coming in second must have been a heartbreaker. How did <u>you</u> <u>feel</u> ?	→ <u>Winning isn't everything.</u> Often people can learn a great deal by just competing.
Experiencer	→ Objective

In such an exchange, it is the therapist's job to intervene and point out to the client his failure to utilize the affective component of his experience. Then the therapist encourages the client to respond to the original question using the experiencer case. To continue with the example above.

<u>Therapist</u>	<u>Client</u>
Yes, all that is true but do you realize that I asked you how you felt and you started in on a "Vince Lombardi" about competition. <u>I</u> really <u>want</u> to know how <u>you</u> felt coming in second.	→ Gee, <u>I</u> didn't <u>know</u> I was doing that. I guess I felt...well... kind of disappointed, maybe.
Experiencer	→ Experiencer

The purpose of this intervention is to get the obsessoid to recognize and utilize the affective component in his own experience, especially in his own interpersonal relations.

2. Decreasing the use of the Modal Case Relation - The obsessoid often avoids taking responsibility for his statements and actions by qualifying them with such words as "perhaps," "maybe," "should" or "ought" (Shaprio, 1965). A good example of this is when the obsessoid makes a statement using should or ought. In such an instance, the statement sounds like a moral imperative, something beyond the control of the obsessoid; therefore, he does not regard it as a choice he has made. Consider the following exchange:

<u>Therapist</u>		<u>Client</u>
Why didn't you just go ask her if she wanted to dance?	→	Well, people <u>should</u> not do things like that unless properly introduced.
I want to know why <u>you</u> didn't ask her to dance. Tell me why <u>you</u> didn't ask her.	→	I <u>guess</u> I was just a <u>little</u> <u>scared</u> .
Could you say that again without using, "I guess."	→	I was scared, all right?
Yes, all right. Now we have something we can work on. Why were you scared?	→	Well, I was feeling....

The client also used modals in his second response. Instead of qualifying his speech with the word "should," he qualified with the words "I guess" and "little." The therapist correctly intervened and the client finally made a statement without the use of any modal case relationships. That is the aim of the second intervention--to get the client to cease maladaptive usage of modal case relations, accept responsibility for his statements and actions and to recognize that change is

possible where previously he thought he had no alternatives.

3. Decreasing the use of the Universal Case Relation - Given the obsessoid's penchant for intellectualization, it is not surprising to find that he is inclined to make generalizations about his experience. The issue is not so much whether the generalizations are right or wrong, rather, the issue is the constricting effect that a generalization has on a person's ability to develop solutions and alternatives in a problematic situation (Bandler and Grinder, 1975). The person who fails to see the nuances of his experience will a priori make the solution to a problem more difficult. Consider the following exchange.

Therapist

Have you tried talking to her.  
You know, she might understand.

Client

Everytime I try to talk with her we always end up fighting.  
→ I don't know...I always mess up.

In the situation above the client is essentially saying that talking is not a solution to his problem and that he is totally inept. Depending on the therapist's preference, either of these generalizations could be addressed. Consider what would happen if the therapist pursued the first generalization.

Therapist

You said that everytime you talk with her you end up fighting. Can you remember a time when you didn't?

Can you remember any other relationship in which talking helped?

What is different about these two situations?

Client

No. We always fight. It's just how we communicate, I guess. Sick, isn't it?  
→

Well, yeah...but it wasn't with a girl. It was with a guy, my brother.  
→

Well, I wasn't dating my brother!  
→

Anything else?

→ Yeah, I wasn't so anxious when talking with my brother...and we had some pretty big arguments.

Let's explore the role that anxiety plays in these two situations...

The client was able to recall a situation which was contrary to his generalization. This permitted him the realization that talking does not always end in an irreconcilable argument. He is now free to explore the differences between the two situations and learn what factors contribute to successful and unsuccessful outcomes.

The three specified interventions are designed to deal with three problematic language habits. One intervention is designed to increase the use of a case relation, the Experiencer case. Two interventions are designed to decrease the use of two maladaptive case relations, the Universal and Modal cases. The changes in the client's language habits are intended to bring about changes in the way the client behaves and experiences (Rudestam, 1979).

## CHAPTER IV

### RESULTS

The order of presentation of the analyses will be as follows. First, the therapists' application of the specified intervention will be evaluated. Second, descriptive statistics, such as percentages of case relations usage, will be presented. Third, the stochastic modeling for each experiment will be presented. This includes reports on tests for first vs. second order Markov chains, tests for stationarity and presentation of the stochastic model based upon transition probabilities.

#### Application of Interventions

The therapists' performance applying the therapeutic interventions was evaluated by means of a ratio of the number of times an intervention was applied relative to the number of times an intervention was appropriate. The experimenter read the transcripts in order to detect when an intervention was appropriate. The number of times interventions were applied was tabulated. A ratio was formed in which the number of correct applications was divided by the number of times an intervention was appropriate. If a therapist applied an intervention every time it was called for, the obtained ratio would be equal to one. If the therapist always failed to apply an intervention when called for, the ratio would be equal to zero. The more times interventions

were correctly applied, the higher the ratio and presumably the greater the therapeutic effect.

The therapists' use of the interventions during the Baseline and Intervention segments of each experiment is presented in Table I. Notice that ratings for the intervention designed to increase the Experiencer case relation are not listed separately in Table I. The rating for the Experiencer intervention was combined with the rating for the Modal intervention. In both experiments the clients resisted talking about their feelings in an indirect manner. They qualified affective statements with the Modal case relation. The therapists attempts to increase the use of the Experiencer case were aimed at getting the clients to speak about their emotions without qualifying them. Thus, the interventions for the Modal and the Experiencer case relation became inextricably interwoven. For this reason, the ratings for the interventions for the Modal and Experiencer case relations were combined.

TABLE I

PERCENTAGE OF THE TIME INTERVENTIONS WERE CORRECTLY APPLIED  
DURING BASELINE AND INTERVENTION SEGMENTS

	Experiment I			Experiment II		
	Universal	Modal	Overall	Universal	Modal	Overall
Baseline	5%	0%	1%	0%	0%	0%
Intervention	23%	44%	38%	26%	22%	24%



Table I shows that the therapists' use of the intervention differ from the Baseline to Intervention segments. In both Experiment One and Two the application of interventions increases from essentially non-use to correct usage 38% of the time in Experiment One, and 24% of the time in Experiment Two. A test for significance of a proportion was conducted for each experiment to determine if this increased use of the interventions was statistically significant. In both experiments the difference between Baseline and Intervention segments was significant (Experiment One,  $z = 5.87$ ,  $p < .01$ ; Experiment Two,  $z = 2.68$ ,  $p < .01$ ).

#### Descriptive Statistics

The overall use of the case relations by any speaker can be represented by the percentage of the time a speaker uses each case relation. There are four situations being considered in each experiment: (1) client monologue - all of the client's utterances; (2) client-therapist dialogue - the verbal interaction in which the client initiates and the therapist responds, e.g. Client: "What do you think?" → Therapist: "It's your decision"; (3) therapist-client dialogue - the verbal interaction in which the therapist initiates and the client responds, e.g., Therapist: "How do you feel now?" → Client: "Better. Thanks"; (4) therapist monologue - all of the therapist's utterances.

The present study used the descriptive statistics to evaluate three hypotheses concerning the effect of the specified interventions and two hypotheses concerning convergence. The client's percentage of case relation usage served as the dependent variable. Comparisons of the client's percentage of case relation usage in the Baseline and Intervention segments provided the basis to evaluate these five hypotheses.

## Experiment One

Hypotheses 1, 2, and 3 concern changes in the client's use of specific case relations. Hypothesis 1 posits that the client will increase his use of the Experiencer case relation. Hypothesis 2 posits that the client will decrease his use of the Modal case relation. Hypothesis 3 posits that the client will decrease his use of the Universal case relation. Tests for a significant difference between two proportions (see Appendix E) were conducted to detect differences between the Baseline and Intervention segments. The two situations which determine the status of the hypotheses are the client monologue and the therapist-client dialogue.

Inspection of the client monologue revealed support for Hypothesis 1 but no support for Hypotheses 2 and 3. The client significantly increased his use of the Experiencer case relation,  $z = 2.30$ ,  $p < .05$ , but his use of the Modal and Universal case relations was unchanged from Baseline to Intervention: Modal,  $z = 0.61$ ,  $p > .05$ ; Universal,  $z = 1.41$ ,  $p > .05$ .

Inspection of the therapist-client dialogue revealed no significant differences in the client's use of the targeted case relation during the Intervention segment: Experiencer,  $z = 1.25$ ,  $p > .05$ ; Modal,  $z = 0.95$ ,  $p > .05$ ; Universal,  $z = 1.25$ ,  $p > .05$ . These results fail to support Hypotheses 1, 2 and 3.

Although there were no hypotheses concerning the therapist's use of the three targeted case relations, Baseline - Intervention comparisons were performed in an effort to develop a more comprehensive analysis. The two remaining situations serving as the object of analyses were the therapist monologue and the client-therapist dialogue. Inspection of

TABLE II  
 PERCENTAGE OF CASE RELATIONS FOR BASELINE  
 AND INTERVENTION SEGMENTS

		Experiment One						
		A	E	I	M	O	S	U
Client Monologue	B	36.82	10.97	5.70	21.77	.68	20.75	3.32
	I	38.17	13.71	2.42	21.39	.36	19.55	4.41
Client-Therapist	B	39.85	9.02	1.50	17.29	.75	30.08	3.50
	I	28.74	20.23	4.12	26.98	.29	17.30	2.53
Therapist-Client	B	28.24	9.92	5.34	19.85	2.29	32.06	2.29
	I	35.85	13.19	3.08	24.37	0	19.33	4.22
Therapist Monologue	B	36.77	13.45	2.69	23.32	.09	21.52	1.35
	I	34.80	14.77	3.66	27.59	.12	16.24	2.81

B = Baseline

I = Interventions

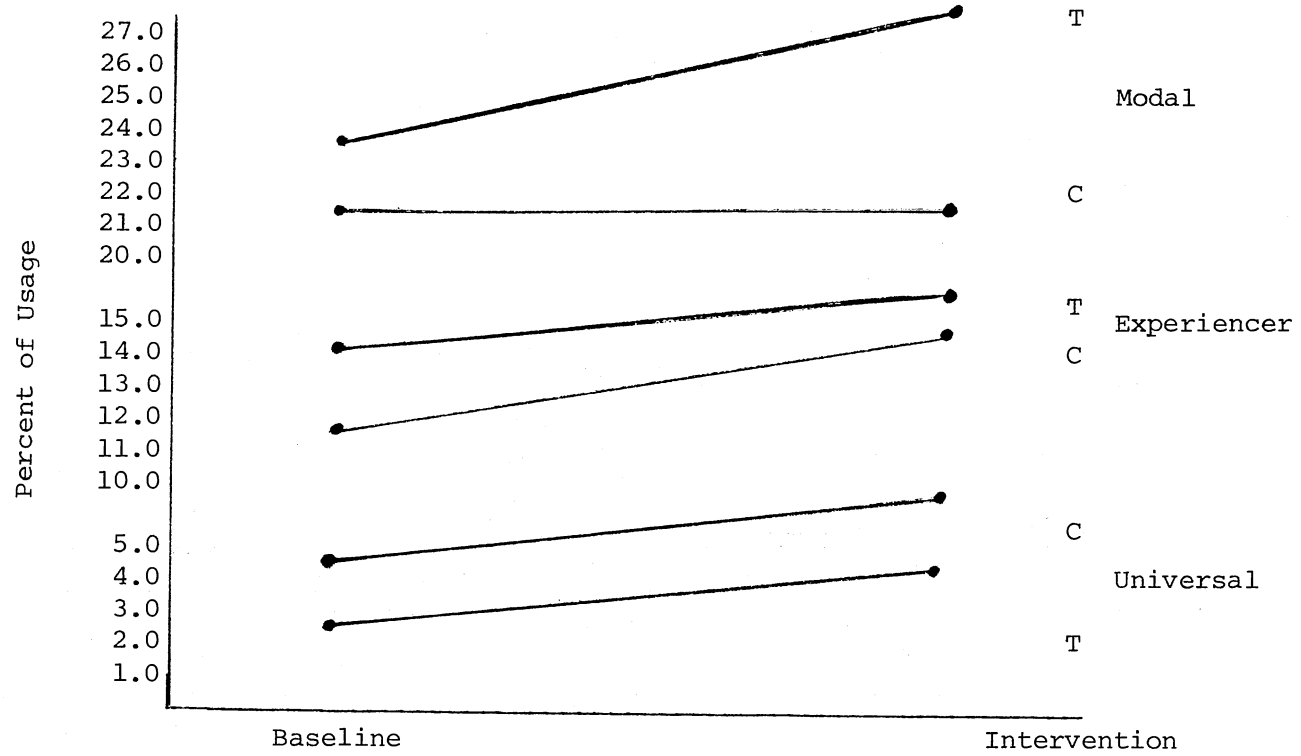
the therapist monologue revealed a significant difference for the Universal case relation,  $\underline{z} = 2.27$ ,  $\underline{p} > .05$ . The therapist's usage of the Experiencer and Modal case relations remained constant: Experiencer,  $\underline{z} = 0.76$ ,  $\underline{p} > .05$ ; Modal,  $\underline{z} = 1.56$ ,  $\underline{p} > .05$ . Inspection of the client-therapist dialogue also increased differences: Experiencer,  $\underline{z} = 3.44$ ,  $\underline{p} < .01$ , and Modal,  $\underline{z} = 2.50$ ,  $\underline{p} < .05$ . There was no change in the therapists use of the Universal in this situation,  $\underline{z} = 0.53$ ,  $\underline{p} > .05$ .

Hypotheses 4 and 5 deal with the phenomenon of convergence, i.e., changes in the client's and therapist's case relation usage such that differences in usage diminishes. Figure 1 reveals that the changes in the client's and therapist's usage of the Experiencer and Universal support Hypotheses 4 and 5. The changes which occur in the use of the Modal case relation does not support Hypotheses 4 and 5.

Inspection of the therapy transcripts for the Intervention segment reveals a clue as to why convergence did not occur with the Modal case relation. It appears that the therapist used the clinical technique of reflection in an effort to curtail the clients use of the Modal case relation. That is, the therapist would restate the client's use of a Modal with the intention of having the client recreate the statement without using the Modal. The following is a typical example.

<u>Client</u>	<u>Therapist</u>
...You know, I would if I could.	→ You would if you could?
Well, I think I can. I mean I want to...	→ ...It sounds like you have alot of mixed feelings.

The therapist's increased use of the Modal case relation due to reflection and the client's continuing use of this case relation creates a situation in which convergence did not occur.



C = Client Monologue  
 T = Therapist Monologue

Figure 1. Experiment One Changes in Case Relation Usage From Baseline to Intervention

## Experiment Two

Hypotheses 1, 2 and 3 were evaluated in the same manner as in Experiment One. That is, the client monologue and the therapist-client dialogue were inspected to detect differences between the Baseline and Intervention segments for the targeted case relations. As in Experiment One, a test for a significant difference between two proportions was used.

Inspection of the client monologue revealed statistically significant changes in all of the targeted case relations: Experiencer,  $z = 3.16$ ,  $p < .01$ ; Modal,  $z = 2.59$ ,  $p < .01$ ; Universal,  $z = 6.41$ ,  $p < .001$ . These changes in the client's case relation usage supports Hypothesis 3 but contradicts Hypotheses 1 and 2. Caution must be used in interpreting these results. The "N" on which these results were found to be statistically significant exceed 2500. Thus, significant differences could be evinced where no meaningful difference existed.

Inspection of the therapist-client dialogue failed to support Hypotheses 1, 2 and 3. There were no significant differences between the Baseline and Intervention segments for the targeted case relations: Experiencer,  $z = 0.0$ ,  $p > .05$ ; Modal,  $z = 1.84$ ,  $p > .05$ ; Universal,  $z = 0.80$ ,  $p > .05$ .

Although it had no bearing upon the hypotheses, the therapist monologue and the client-therapist dialogue were subjected to a significance test for two proportions. Inspection of the therapist monologue revealed no differences between the Baseline and Intervention segments for the targeted case relations: Experiencer,  $z = 0.73$ ,  $p > .05$ ; Modal,  $z = 1.38$ ,  $p > .05$ ; Universal,  $z = 0.0$ ,  $p > .05$ . Inspection of the client-therapist dialogue revealed a significant increase in the thera-

TABLE III  
 PERCENTAGE OF CASE RELATIONS FOR BASELINE AND  
 INTERVENTION SEGMENTS

		Experiment Two						
		A	E	I	M	O	S	U
Client Monologue	B	41.44	7.36	3.96	22.68	.64	11.96	11.96
	I	41.27	5.48	4.74	26.43	.67	13.94	7.49
Client-Therapist	B	30.94	8.52	9.87	25.11	.90	19.37	5.38
	I	27.62	11.50	9.67	22.65	0	19.06	9.94
Therapist-Client	B	37.71	6.36	3.39	26.69	.85	14.14	10.59
	I	30.75	6.09	6.65	33.52	0	13.57	9.42
Therapist Monologue	B	35.55	11.85	10.43	23.22	.47	13.27	5.21
	I	28.23	9.76	10.3	27.49	0	19.79	4.75

pists use of the Universal case relation,  $\underline{z} = 2.38$ ,  $\underline{p} < .05$ . There were no other significant differences: Experiencer,  $\underline{z} = 1.17$ ,  $\underline{p} > .05$ ; Modal,  $\underline{z} = 1.10$ ,  $\underline{p} > .05$ .

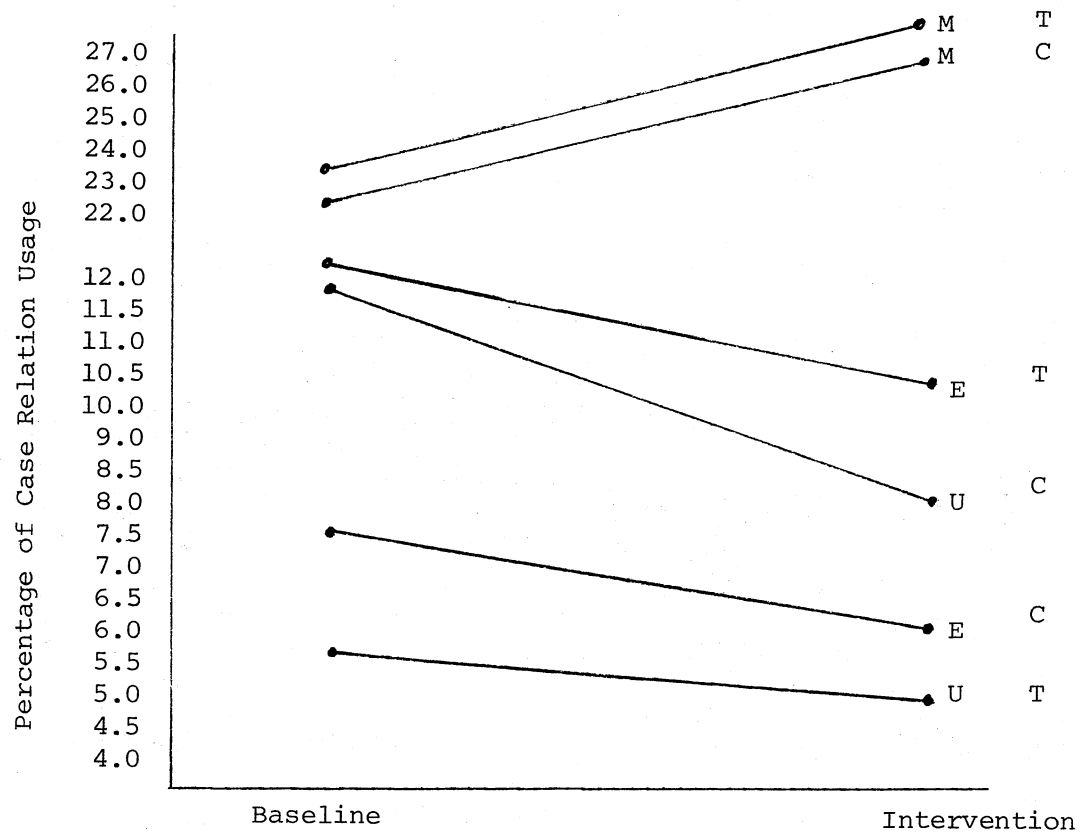
Hypotheses 4 and 5 concern the phenomenon of convergence. Figure 2 reveals that convergence occurred on all of the targeted case relations. This is most evident for the Modal case relation. Although there was still considerable difference between client and therapist usage of Experiencer and Universal case relations by the Intervention segment, the direction of change and the diminishing differences for all the targeted case relation supports the contention that convergence had occurred.

#### Stochastic Analyses

Anderson's (1973) three step procedure for determining a Markov model was employed in each experiment. First, the order of the chain was determined by comparing Chi-Square/Degrees of Freedom ratios for first and second order Markov chains. The order of chain with the higher ratio was retained as the chain fitting the data. Second, stationarity was assessed by dividing each therapy session in half and comparing the transtions in the first half to those in the second half. A nonsignificant Chi-Square indicates stationarity. A significant Chi-Square indicates a lack of stationarity. Third, the Markov model was derived by obtaining the transition probabilities for the matrix describing the data.

As it was with the descriptive statistics, the stochastic analyses make use of the four situations available for study in a therapy situation: the client's monologue, the therapist's monologue and the dialogue





C = Client Monologue; T = Therapist Monologue  
 E = Experiencer; U = Universal; M = Modal

Figure 2. Experiment Two Changes in Case Relation Usage From Baseline to Intervention

with the therapist initiating and the client responding and the dialogue with the client initiating and the therapist responding.

Unlike the descriptive statistics, three case relation categories were used as opposed to the seven possible case relations. This meant that the number of states of the Markov chain was reduced from seven to three. This reduced the overall error involved in the probabilistic modeling. The three case relation categories were constructed by collapsing all seven case relations into three categories. These case relation categories were: (1) Agentive - a combination of the Agentive and Experiencer cases on the basis that both case relations involve an animate noun being the initiator or recipient of an action; (2) Instrumental - a combination of the Instrumental, Objective and Stative case relations on the basis that they entail an unidentified or inanimate noun as initiator or receiver of an action; (3) Pathological - a combination of the Universal and Modal case relations on the basis that these were identified as maladaptive case relations.

#### Determining the Markov Model

##### Experiment One

Table IV presents the statistics used to evaluate the order of the Markov chains. For each chain the Chi-Square is presented and directly below the Chi-Square/Degrees of Freedom ratio is presented. The criteria used to determine the order of the Markov chain is this ratio, i.e., the order of the chain with the higher ratio is used to describe the data. Examination of the client monologue reveals that a first order Markov chain is clearly the better description. For the dialogue in which the client initiates and the therapist responds, a first order

TABLE IV

## EXPERIMENT ONE - DETERMINING THE ORDER OF THE MARKOV CHAIN

	Client Monologue	Client-Therapist Dialogue	Therapist-Client Dialogue	Therapy Monologue
<u>Baseline</u>				
1st order - $\chi^2$	31.43*	9.80*	6.95	4.19
- R	7.86	2.45	1.74	1.05
2nd order - $\chi^2$	13.21*	0.92	3.21	.47
- R	3.30	.84	0.80	.12
<u>Intervention</u>				
1st order - $\chi^2$	26.25*	34.50*	12.49*	20.11
- R	6.56	8.63	3.12	5.04
2nd order - $\chi^2$	12.25*	12.50*	5.95	4.89
- R	3.06	3.13	1.49	1.22

$\chi^2$  - Chi-Square.

R - Chi-Square/degrees of freedom ratio.

\* - Significant at the .05 level.

chain is also the better description of the data in the Baseline and Intervention segments. For the dialogue in which the therapist initiates and the client responds a first order Markov chain is a better descriptor of the data. Finally, for the therapist monologue, the Baseline and Intervention segments fit a first order Markov chain.

Overall, a first order Markov chain appears to describe the data of Experiment One better than a second order Markov chain for all four situations examined. This is important because comparison of the Baseline and Intervention segments is greatly facilitated when all the Markov chains are of the same order. For this reason the first order Markov chain will provide the basis for further stochastic analyses on Experiment One.

Stationarity for Experiment One was assessed by splitting in half each session and calculating a Chi-Square comparing the frequency of transitions for the first half to the frequency of transitions of the second half. Chi-Square values less than those expected to occur at the .05 level were taken to indicate stable transition frequencies. Under this condition the transition probabilities of the Markov chain are said to have stationarity. Chi-Square values greater than that expected at a .05 level indicate that the frequency of transitions from the First half compared to the second half are unstable. Under this condition, transition probabilities are said to lack stationarity.

The Chi-Square tests for stationarity in Experiment One are presented in Table V. The analyses reveal that many sessions and most of the Baseline and Intervention segments lack stationarity. The following sessions are the only ones which exhibit stationarity as defined above:

(a) client monologue - Sessions 5 and 6; (b) client initiate-therapist

response dialogue - Session 6; (c) therapist initiate-client response dialogue - Sessions 2 and 3 and the Intervention segment; (d) therapist monologue - Sessions 2, 4 and 6 and the Baseline segment.

TABLE V  
TEST FOR STATIONARITY SPLIT-HALF CHI-SQUARE

	Experiment One					
	Session					
	1	2	3	4	5	6
Client Alone	92.15	26.20	39.97	19.21	9.07*	10.67*
Client-Therapist	22.69	22.10	24.64	23.2	30.89	6.29*
Therapist-Client	26.27	18.49*	18.49*	20.6	67.88	28.11
Therapist Alone	11.33	10.47*	33.74	12.95*	26.14	13.73*

\* The session has stationarity.

These results suggest that the strict requirement of stationarity must be relaxed if a stochastic analysis is to be conducted (Anderson, 1973). Two potential explanations for the lack of stationarity are suggested by the data. First, the psychotherapeutic process in the beginning of a session is different from that at the end of a session. Thus, the test for stationarity in this instance is actually a comparison of the therapeutic process at the beginning and the end of each session. The results indicate that these segments do differ with respect to the process. The other possible explanation is that case

relations as an experimental unit are too variable to be used in stochastic analyses. There is no means to assess the validity of this contention. The recommendation suggested by previous researchers and that which will be followed in this study, is to continue with the stochastic analyses but remain cognizant of the lack of stationarity (Anderson, 1973).

Having evaluated the data for order of dependence and stationarity, the Markov model may now be presented. The model for each segment is the transition matrix derived from the actual data comprising each segment. Table VI presents the transitions probabilities for the three state model, for Baseline and Intervention segments, for each of the four situations being considered.

By raising the transition matrix by successive powers, every row in the matrix eventually contains the same set of transition probabilities. This set of probabilities, or probability vector, is the fixed point probability vector for the states in the Markov chain. It represents the asymptotic probability of the chain. The fixed point probability vectors attained in Experiment One are presented in Table VII.

#### Experiment Two

The four situations and the three case relation categories in Experiment Two are the same as those used in Experiment One. Table VIII lists the obtained Chi-Squares and the Chi-Square/Degrees of Freedom ratios used to determine the order of the Markov chain.

In the client monologue situation the best fitting Markov chain for the Baseline and Intervention segments was the first order Markov chain. For the dialogue situation in which the client initiates and the thera-

TABLE VI  
 TRANSITION PROBABILITIES OR BASELINE AND INTERVENTION  
 FOR THREE PARAMETER MODEL

		Baseline			Intervention		
		A	I	P	A	I	P
Client	A	54.8	22.42	22.78	54.93	23.29	11.30
	I	40.13	35.42	24.45	45.86	29.30	24.84
	P	43.73	24.07	32.20	44.08	21.76	34.16
Client/Therapist	A	60.00	25.45	14.55	59.86	17.01	23.13
	I	39.13	45.65	15.22	30.93	39.18	29.90
	P	43.25	25.00	31.25	50.52	11.34	38.14
Therapist/Client	A	47.37	28.07	24.56	55.17	18.97	25.86
	I	27.91	53.49	18.60	42.16	32.35	25.49
	P	35.48	41.94	22.58	44.44	17.28	38.29
Therapist	A	51.79	25.00	23.21	54.93	22.41	22.66
	I	37.50	30.36	32.14	46.95	28.05	25.00
	P	45.45	21.82	32.73	40.96	22.09	36.95

TABLE VII  
FIXED POINT PROBABILITY VECTOR

		Experiment One		
		Parameter		
		A	I	P
Client Alone	B	.48	.26	.26
	I	.50	.24	.26
Client/Therapist	B	.50	.32	.17
	I	.51	.20	.29
Therapist/Client	B	.37	.42	.22
	I	.49	.21	.29
Therapist Alone	B	.46	.25	.28
	I	.49	.24	.27



TABLE VIII

## EXPERIMENT TWO - DETERMINING THE ORDER OF THE MARKOV CHAIN

	Client Monologue	Client-Therapist Dialogue	Therapist-Client Dialogue	Therapist Monologue
<u>Baseline</u>				
1st order - $\chi^2$	63.71*	3.10	9.41*	8.85*
- R	15.93	.78	2.35	2.21
2nd order - $\chi^2$	31.76*	3.13	1.83	6.25
- R	7.94	.78	.46	1.56
<u>Intervention</u>				
1st order - $\chi^2$	98.73*	28.18*	10.43*	4.71
- R	24.68	7.04	2.61	1.18
2nd order - $\chi^2$	53.28*	1.67	1.33	8.77*
- R	13.23	.42	.33	2.19

$\chi^2$  - Chi-Square.

R - Chi-Square/degrees of freedom ratio.

\* - Significant at the .05 level.

pist responds there is no clear cut order for the Markov chain in the Baseline segment. The Intervention segment fits a first order chain. Since the Baseline has no clear cut order, a first order Markov chain will be used to describe this segment. This will facilitate comparisons between the Baseline and Intervention segments for the client-therapist dialogue. In the dialogue situation in which the therapist initiates and the client responds a first order chain fits the Baseline and Intervention data better. Finally, in the therapist monologue, a first order chain is the better descriptor of the data in the Baseline segment. This is not, however, the case for the Intervention segment. Despite the fact a second order chain is the better descriptor of the data, a first order Markov chain will be used to describe the Intervention segment of the therapist monologue. The justification for this is twofold. First, this situation has no bearing on determining the status of any hypotheses. Second, by retaining a first order Markov model this situation can be directly compared to other first order Markov models.

Stationarity for Experiment Two was assessed in the same manner used in Experiment One. That is, each session was split into half and a Chi-Square was calculated to compare the frequencies of transitions in the first half to those in the second half. Table IX lists the Chi-Squares obtained in the tests for stationarity.

In the client monologue situation only Sessions 1 and 5 exhibited stationarity. In the client initiating and therapist responding dialogue, Sessions 1, 3 and 5 exhibited stationarity. In the therapist initiating and client responding dialogue, Session 1, 2, 5 and 6 exhibited stationarity. In the therapist monologue, Session 1, 2 and 3 exhibited stationarity. Under these conditions the strict requirement

TABLE IX  
 TEST FOR STATIONARITY SPLIT-HALF CHI-SQUARE

	Experiment Two					
	Session					
	1	2	3	4	5	6
Client Alone	18.17*	32.73	35.06	47.04	18.34*	72.39
Client/Therapist	12.11*	77.05	9.81*	30.54	14.28*	19.36
Therapist/Client	12.63*	12.15*	64.68	39.55	14.15*	8.85
Therapist Alone	15.50*	9.20*	17.54	43.51	74.69	24.80

\* Indicates that the session has stationarity.

of stationarity must be relaxed if the stochastic analysis is to continue (Anderson, 1973). As discussed previously with Experiment One, the lack of stationarity as defined is not a practical problem. Most therapists expect the therapeutic process to differ at the beginning and the end of a therapy session.

Having evaluated the data for order of dependence and stationarity, the Markov models can now be presented. The model for each segment is the transition matrix derived from the actual data comprising each segment. For all eight Markov models presented it must be recalled that a liberal stationarity assumption must be employed. The Markov models for the Baseline and Intervention segments of all four situations are presented in Table X.

The fixed point probability vectors for Experiment Two are presented in Table XI. These asymptotic probabilities represent the likelihood that a speaker will use a specified case category at some undetermined point in the future.

#### Experiment One and Two: Stochastic Analyses of Case Relation Usage

Hypothesis 6 concerns the transition probabilities in which the client responds by using the Pathological case category. Specifically, Hypothesis 6 posits that there will be a decrease in the client's use of the Agentive  $\rightarrow$  Pathological, (AP), transition, the Instrumental  $\rightarrow$  Pathological, (IP), transition and the Pathological  $\rightarrow$  Pathological, (PP), transition. A test of significant differences between two proportions was conducted to compare the frequency of these transitions in the Baseline and Intervention segments. The two situations which have a bearing

TABLE X  
 TRANSITION PROBABILITIES BASELINE AND INTERVENTION  
 FOR THREE PARAMETER MODEL

		Experiment Two					
		Baseline			Intervention		
		A	I	P	A	I	P
Client	A	55.26	15.52	29.22	55.61	17.92	26.47
	I	44.23	22.86	32.91	41.30	26.72	31.98
	P	41.88	15.93	42.19	39.13	16.74	44.11
Client-Therapist	A	42.42	31.31	26.26	47.22	32.64	20.14
	I	38.00	34.00	28.00	44.78	29.85	25.37
	P	35.14	27.03	37.84	27.81	24.50	47.68
Therapist-Client	A	47.57	11.65	40.78	40.52	17.65	41.83
	I	37.14	30.00	32.86	36.96	29.35	33.70
	P	46.03	17.46	36.51	31.90	16.38	51.72
Therapist	A	45.00	26.00	29.00	39.59	31.25	29.17
	I	62.75	25.53	13.73	47.79	23.89	28.32
	P	56.67	13.33	30.00	36.07	32.08	37.29

TABLE XI  
 FIXED PROBABILITY VECTOR FOR THREE PARAMETER MODEL

		Experiment Two		
		Parameter		
		A	I	P
Client Alone	B	.49	.17	.34
	I	.47	.19	.34
Client-Therapist	B	.40	.46	.14
	I	.41	.41	.18
Therapist-Client	B	.40	.30	.30
	I	.37	.17	.44
Therapist Alone	B	.52	.21	.26
	I	.41	.28	.31

on this hypothesis are the client monologue and the therapist client dialogue.

In Experiment One, inspection of the client monologue revealed a change in the AP transition,  $\underline{z} = 8.45$ ,  $\underline{p} < .01$ . The other two transitions did not differ significantly from Baseline to Intervention: IP,  $\underline{z} = 0.60$ ,  $\underline{p} > .05$ ; PP,  $\underline{z} = 1.08$ ,  $\underline{p} > .05$ . Inspection of the therapist-client dialogue revealed no change in two transitions: AP,  $\underline{z} = 0.43$ ,  $\underline{p} > .05$  and IP,  $\underline{z} = 1.46$ ,  $\underline{p} > .05$ . The PP transition changed in such a manner that it contradicted Hypothesis 6,  $\underline{z} = 3.36$ ,  $\underline{p} > .01$ . This suggests that by the Intervention phase, if the therapist used the Pathological case category the client would most likely respond by using the same category.

In Experiment Two, inspection of the client monologue revealed support of Hypothesis 6 from the AP transition,  $\underline{z} = 2.40$ ,  $\underline{p} < .05$ . Hypothesis 6 received no support from the other two transitions as they remained unchanged from the Baseline to the Intervention segments: IP,  $\underline{z} = 0.78$ ,  $\underline{p} > .05$ ; PP,  $\underline{z} = 0.75$ ,  $\underline{p} > .05$ . Inspection of the therapist-client dialogue revealed similar results as found in Experiment One. There was a change in the PP transition ( $\underline{z} = 3.66$ ,  $\underline{p} < .01$ ) which contradicted Hypothesis 6. There was no change in the probabilities associated with the other two transitions: AP,  $\underline{z} = 0.24$ ,  $\underline{p} > .05$ ; IP,  $\underline{z} = 0.26$ ,  $\underline{p} > .05$ .

Hypothesis 7 concerned the fixed point probabilities associated with the Pathological case category. In both experiments the fixed point probabilities for the Pathological category in the client monologue remained identical. There was no need to conduct a statistical comparison under these conditions. In Experiment One, the therapist-

client dialogue revealed no significant change in Pathological case category fixed point probability,  $P$ ,  $\underline{z} = 1.63$ ,  $\underline{p} > .05$ . In Experiment Two, however, the data suggests that the client significantly increased his use of the Pathological category in responding to the therapist,  $P$ ,  $\underline{z} = 3.52$ ,  $\underline{p} < .01$ . This finding contradicts Hypothesis 7.

#### Experiment One and Two: Chi-Square Analyses for Convergence

Chi-Squares were calculated to compare the client and therapist monologues in the Baseline and Intervention segments. The purpose of these Chi-Squares was to determine if the client and therapist monologues became increasingly similar in the course of the six therapy sessions. In Experiment One the Chi-Square comparing the client and therapist monologues in the Baseline segment was  $\chi^2 = 4.01$ . In the Intervention segment the Chi-Square was  $\chi^2 = 12.33$ . The larger Chi-Square in the Intervention segment would suggest that the client and therapist monologue transition probabilities were diverging. This, however, does not appear to be the case. The Agentive  $\rightarrow$  Pathological transition probability shows great variability from Baseline to the Intervention segment. The therapist increased her use of this transition due to her use of reflection. The client reduced his use of this transition due to the effect of the therapist's interventions. If this transition is not included in the Chi-Square for the Intervention the adjusted Chi-Square statistic is  $\chi^2 = .67$ . This suggests that there is a reduction in the difference between client and therapist monologue transition probabilities for the same transitions. This result supports Hypothesis 8.



In Experiment Two, there is clear-cut support for Hypothesis 8. The Chi-Square statistic comparing the client and therapist monologues for the Baseline segment was  $\chi^2 = 33.35$ . The Chi-Square for the Intervention segment was  $\chi^2 = 7.58$ . This reduction in Chi-Square from Baseline to Intervention represents a reduction in differences between client and therapist case relation usage. This can be taken as evidence for convergence. It is clear from the overall changes in the transition probabilities that it is the therapist who is modifying her language to match the client.

Comparison of the client and therapist fixed point vectors for the monologue also serve as an index of convergence and as such this is the focus of Hypothesis 9. In Experiment One, the client and therapist fixed point vectors for the Baseline were compared. There was a .02 difference for the Agentive category, .01 for the Instrumental and .02 for the Pathological category. In the Intervention segment the differences between client and therapist for the Agentive category was .01, the Instrumental category 0.0 and the Pathological category .01. The total differences for the Baseline segment was .05; for the Intervention segment the total difference was .02. This represents a decrease of .03. Overall, these changes support the contention that convergence occurred.

In Experiment Two, the client and therapist differences for the asymptotic probabilities of the three states were: Agentive .03; Instrumental .04 and Pathological .08. The differences for the three states in the Intervention segment were: Agentive .08, Instrumental .09 and Pathological .03. The sum of the client-therapist differences for the Baseline was .15. The sum of the differences for the Intervention

segment was .20. The increased difference from Baseline to Intervention suggests that convergence did not occur. The differences in the Agentive and Instrumental case categories are responsible for the lack of convergence. Changes in the client and therapist usage of the Pathological case category indicates that convergence exists for this category.

#### Summary of Results

The hypotheses tested fall into two categories: (1) case relation usage; (2) convergence. There were two methods by which these hypotheses were tested: (1) descriptive statistics; (2) stochastic analyses. Overall, the hypotheses concerning convergence were supported whether the method of analysis relied upon was descriptive statistics or stochastic analyses. The hypotheses concerning case relation usage did not fare so well. The data from the client monologue in both experiments resulted in mixed support for Hypotheses 1 and 3. Analysis of the client monologues permitted outright rejection of Hypothesis 2. Analysis of the therapist-client dialogue in both experiments resulted in the rejection of Hypotheses 1, 2 and 3. The implication of all these findings is discussed in the following chapter.

## CHAPTER V

### DISCUSSION

Three topics will be presented for discussion. First, the therapists' application of the specified interventions will be considered. The focus of this discussion will be the therapists' proficiency in using the specified interventions. The second topic discussed will be changes in the clients' case grammar usage. The third topic discussed will be the phenomenon of convergence. This section will conclude with several recommendations for future research.

#### Application of Interventions

There are three aspects of the therapists' performance which have an impact on the findings of the present study. These aspects of the therapists' performance are: (1) the increased use of interventions during the Intervention segment; (2) the percentage of correct application of the interventions; (3) the use of reflection when making interventions. Each of these aspects of therapist performance will be discussed.

The therapists' increased use of the specified interventions during the Intervention segment reveals two important factors. First, it reveals that the training the therapist received at the beginning of the study successfully increased the therapists' sensitivity and responsiveness to the targeted case relations. If the therapists could alter

their case grammar habits in response to the training sessions, then one could expect the clients might be able to change their case grammar habits in response to therapy. Second, the change in the therapists' way of relating in therapy necessitated a change in the way the clients related to the therapists. The exact manner in which the clients altered their behavior is the subject matter of the hypotheses discussion. The overall import of the therapists' increased use of the specified interventions is the fact that the clients had to respond to the therapists' new manner of interacting in the therapy setting.

The percentage of correct application of interventions is an important issue. Presumably, the higher the percentage of application, the more effective the interventions. Conversely, the lower the percentage of application, the less effective the interventions. The overall percentage of application in Experiment One and Two was 38% and 24%, respectively. In order to determine if these are high, medium or low percentages, they should be compared to other application percentages in different studies. There is, however, a problem with this approach. The proficiency of application of interventions (independent variables) by therapists or experimenters is not commonly reported. It seems as if this aspect of performance has been largely ignored in the reporting of laboratory studies (Kasner, 1958) and clinical studies (Allyon and Haughton, 1964; Auerswald, 1974). This means that appropriate standards of comparison are not available to evaluate the percentages obtained in the present study. Since empirical standards of comparison are not available, the appropriate evaluation seems to be rational evaluation.

Prima facie, the percentages of application obtained in the present study appear to be small. A test for significance of a proportion con-

ducted in both experiments revealed that the percentages of application were significantly larger than zero. Hence, the therapists' performance could be expected to have some effect. Because the percentage of application was small, the effect of the interventions could be expected to be small. Furthermore, the low percentage of application suggests that the therapists' use of the interventions was variable. Hence, variability in the clients' responses to the interventions could be expected. Overall, the low percentage of application could be expected to produce some minimal but observable change in the clients' case grammar usage. The effect of the interventions would probably have been greater had they been applied more frequently.

The third aspect of the therapists' performance to be discussed is the therapists' use of reflection in order to make interventions. Reflection is a therapeutic technique popularized by Carl Rogers. This technique is defined as the therapist summarizing and restating a set of utterances made by a client using the client's own words. The effectiveness of reflection vis-a-vis the hypothesized effect of the interventions is not immediately obvious. The point in question is whether or not the therapists could have used different, more potent interventions.

The therapists could have utilized other techniques to make the interventions, e.g., interpretation, confrontation or teaching. Studies have been conducted comparing the effects of reflection to these other techniques. Bergman (1950) found that reflection of feeling increases the positive aspects of the therapeutic process whereas interpretation increases the negative aspects of the process. Dittmann (1950) found that progressive therapeutic movement was associated with responses

which were slightly different than, but similar to, pure reflection. More recently, Auerswald (1974) found that restatement demonstrated a detrimental effect on client exploration of feelings whereas interpretation facilitated talking about feelings. Despite the existence of some contrary evidence, reflection has been empirically and clinically substantiated as a powerful therapeutic technique. The fact that therapists in the present study used this technique suggests that they used one of the more potent types of interventions available to them. Consequently, the interventions that the therapists made probably had an impact on their clients.

An overview of the three aspects of the therapists' performance suggests that the training the therapists received effectively sensitized them to respond to the clients' maladaptive case grammar habits. The effectiveness of the therapists' training also suggests that an individual's case grammar habits are subject to change under the influence of external sources. Given the malleability of an individual's case grammar habits, it is unfortunate that therapists did not have a higher percentage of intervention application. On a rational basis one could argue that the effect of the interventions would have been greater had they been applied more frequently. Despite the low frequency of interventions, the therapists' use of reflection probably maximized the effect of the interventions. The exact effect the therapists' interventions had on the clients' case grammar habits is the topic of the next section.

## Case Relation Usage

### Descriptive Statistics

Hypothesis 1, which pertained to the client's use of the Experienter case relation, received support from Experiment One and was contradicted in Experiment Two. Meara (1981) has demonstrated that the therapist's intentions do affect the observed case grammar usage in a session. In the present study, the therapists' similar intentions and interventions resulted in two contradictory effects. The basis of this effect may be due to an important difference between the two clients involved in the study.

In Experiment One the client was a "therapy veteran", i.e., approximately four years of prior therapy experience. With this backlog of therapy experience the client was accustomed to speaking about his feelings. Hence, the client responded appropriately to the therapist's use of reflection aimed at increasing use of the Experienter case relation. In contrast, the client in Experiment Two was a neophyte to therapy. He was unaccustomed to self-disclosure and candid discussion of his feelings. With no prior experience to assure the client that discussion of his feelings would be beneficial, the neophyte client did not respond appropriately to the interventions. In fact, it appears as if the client became threatened and responded defensively by decreasing his use of the Experienter case relation. Overall, the difference between the clients in terms of therapy experience seems to provide the basis for understanding their differential response to this intervention.

Hypothesis 3 was supported by the findings in Experiment Two as the client significantly decreased his use of the Universal case relation

during the Intervention segment. This effect occurs, however, in the context of other changes which mitigate this success. While the client decreases his use of the Universal case relation, he also decreases his use of the Experiencer case relation and increases his use of the Modal case relation. This pattern of case relation usage suggests an overall increase in maladaptive case grammar habits which mitigates the overall success of the case grammar interventions. This pattern of shifting maladaptive behavior is not unique to case grammar. Freud warned early in the development of Psychoanalysis that the "repetition compulsion" made the treatment of symptoms futile. His caveat certainly seems appropriate for therapists interested in case grammar interventions. Translated into case grammar terminology the caveat is: the neutralization of one maladaptive case grammar habit may occur in the context of noticeable increases in other maladaptive case grammar habits.

#### Stochastic Analyses

Hypothesis 6 received partial support in both experiments with a significant reduction in the probability of an Agentive  $\rightarrow$  Pathological (A $\rightarrow$ P) transition. This reduction occurred in the context of no significant increases in other transitions with the Pathological case category as the consequent state. Thus, the reduction of the A $\rightarrow$ P transition probability represent a real reduction in the use of the Pathological case category. This reduction indicates the clients' increasing ability to relate facts (Agentive category) without the use of maladaptive (Pathological category) case grammar habits. This decrease probably reflects a decrease in client defensiveness. More specifically, it may indicate the presence of good rapport and the beginnings of a good



therapeutic relationship.

A related finding concerning Hypothesis 6 was that both clients increased probability of the Pathological → Pathological transition in the therapist-client dialogue situation. This means that during the Intervention segment, if the therapist used the Pathological category the client responded by using the Pathological category. This is different from the client monologue situation which showed an overall reduction in the use of the Pathological category. This suggests that there is some factor present in the dialogue situation which elicits the client's use of the Pathological case category and this factor is not present in the monologue situation. The explanation could be that the client is modeling the therapist's use of the Pathological case category. This explanation is a weak one since the modeling occurring in the dialogue situation would probably carry over into the monologue situation and there is no evidence of this. A more likely conjecture is that the client uses maladaptive case grammar habits in the dialogue situation because he is being defensive. Obsessoids are noted for being noncommittal and evasive in interpersonal relations (Shapiro, 1965). The most intimate situation in therapy, and hence the most threatening for the obsessoid, is the direct dialogue situation. It is in this situation that the client would be expected to behave most defensively. Indeed, the present study does reveal both clients exhibit increasing maladaptive case grammar habits in this situation.

#### Convergence

#### Descriptive Statistics

Hypothesis 4 was supported in both experiments. In Experiment One,

the client and the therapist exhibited convergence on the Experiencer and Universal case relations. In Experiment Two, there was convergence on all three case relations examined. With the exception of the Modal case relationship in Experiment One all the targeted case relations exhibited convergence. Failure to attain convergence on this one case relation was discussed in the Results Section as being a product of the therapist's style of intervening. To recapitulate: the therapist's use of reflection increased her use of the Modal case relation while decreasing the client's use which rendered the net result of no convergence. With this one exception, Patton's (1977) notion of convergence is evinced by the findings in the present study. That is, the client-therapist interaction over time results in changes in the way the participants express themselves. The exact change which Patton specified, and that which was observed in the present study, was that the client and therapist would exhibit increasingly similar case grammar habits.

Patton (1977) and Bieber (1977) also specify that the client may acquire the therapist's case grammar habits. Hypothesis 5 was based upon this assertion and it received support from both experiments. In Experiment One, the client increased his use of the Experiencer case relation. In Experiment Two, the client decreased his use of the Universal case relation. In both instances, the client exhibited convergence and seemed to be acquiring some adaptive aspects of the therapists' case grammar habits. This phenomenon has been observed in previous research (Patton, 1977; Bieber, 1977) and has been explained as part of the therapeutic process. Specifically, the client is believed to be acquiring a set of premisses which constitute a treatment policy, i.e., how therapy is to be conducted and even how one is to speak in therapy

(Bieber, 1977). With this understanding, convergence can serve as feedback to the therapist concerning the client's current date of adaptation to the therapy setting. In the present study, the feedback is that both clients exhibited adaptation to the therapy setting.

Although previous authors have provided a means to understand the client's acquisition of the therapist's case grammar habits, there has been no recognition or discussion of the therapist's acquisition of the client's case grammar habits. In direct contradiction of Hypothesis 5 both therapists exhibited convergence with their client. In Experiment One, the therapist converged with the client by increasing her use of the Universal case relation. In Experiment Two, the therapist converged by increasing use of the Modal and decreasing use of the Experiencer case relation. These findings reveal that the therapist can converge with the client, just as the client has been shown to converge with the therapist. The implication of this finding may be extrapolated from previous research. The therapist's acquisition of the client's case grammar habits implies that the therapist has acquired some of the client's premisses concerning how one should speak in therapy. As mentioned earlier, convergence can serve as feedback about the nature of these premisses. Considering the present findings, the feedback is that the client's maladaptive case grammar habits have become a part of the treatment policy. This is not necessarily a bad occurrence insofar as the therapist is able to recognize and renegotiate this aspect of the treatment policy. The overall implication of this finding is an important one: not all forms of convergence are adaptive. Some forms of convergence are to be aspired to, while others, because of their maladaptive nature, should be eschewed.

### Stochastic Analyses

Hypothesis 8 was supported in both experiments. Chi-Square statistics comparing transition probabilities for client and therapist monologues were smaller for the Intervention segment. This suggests that the client and therapist had developed a pattern of mutual case relation usage. This finding provides a slightly different type of information than generated by the descriptive statistics. The descriptive statistics indicate "how much" the client and therapist use the case relations. The stochastic analysis indicates "how" the client and therapist use these case relations. In the present study the stochastic analysis reveals that the client and therapist match on their pattern of case relation usage. More specifically, they develop a mutually agreeable style for relating. It is this mutual style of relating that forms the basis of Patton's (1977) phenomenon of convergence.

Hypothesis 9 is also supported in both experiments. There is a reduction in differences between client monologue and therapist monologue fixed point probabilities. This indicates that the client and therapist have significantly altered and matched their case grammar habits. Since the fixed point probabilities indicate an asymptotic probability, this finding also suggests that this pattern case grammar usage will continue into the future. This assumes that there is no change in the basic premisses underlying the treatment policy negotiated for therapy. Hence, if the client and therapist continue to interact in the same manner, they can be expected to continue exhibiting a great deal of convergence.

## Summary

### Interventions

The training that the therapists received successfully increased their sensitivity and responsiveness to the clients' case relation usage. Although the training was successful, the therapists' use of the interventions occurred a low percentage of the time. Both therapists favored the reflection technique when making interventions.

### Case Relation Usage

Hypothesis 1 received mixed support from both experiments. Differences in the clients' previous therapy experience was seen as the source of this finding. Hypothesis 3 garnered support from Experiment Two. This occurred in the context of other changes which could be labeled "defensive". This finding provided the caveat: disabusing the client of one maladaptive habit may cause increased reliance on other maladaptive habits.

Hypothesis 6 received some support from both experiments. The client demonstrated the ability to discuss factual aspects of their experience without being defensive.

### Convergence

All the hypotheses concerning convergence received some support from both experiments. The only convergence hypothesis not receiving unequivocal support is the one which stated convergence would be consistent with the hypothesized effects of the interventions. The findings revealed that when convergence occurs it is not always the client

matching the case grammar usage of the therapist. This discovery led to the enrichment of the concept of convergence in two ways. First, it demonstrated that convergence may be directional. That is one speaker may maintain their case grammar habits while another person changes to match these habits. Second, convergence was found to be adaptive or maladaptive depending upon how it was achieved. Adaptive convergence occurs when a speaker forsakes maladaptive case grammar habits. Maladaptive convergence occurs when a speaker acquires maladaptive case grammar habits.

#### Recommendations for Future Research

In the course of analyzing the data of the present study, there was a growing awareness that trends in the data were slowly developing. The key word is "slowly". It may be the case that the six sessions observed in the present study was too short of a time to allow this slow forming trend to reveal itself. The rationale underlying the use of the single subject design and the stochastic analyses was that it would evince the trends present in the data. It appears as if the utility of the design and the analyses is more than adequate but it has an important limitation. It can only evince the trends, patterns or processes in the data which have had time to develop. Future research may need to sample from therapy dyads over a much longer period of time. There can be little doubt that the results obtained in psychotherapy research depend upon when the observations are made.

The present study also revealed that the interventions were successful in some instances and ineffective in others. Future research should work to discover what factors contribute to the success or failure

of case grammar interventions. Two factors which merit investigation were suggested by the present study: (1) experience - previous therapy exposure of the client and the therapist; (2) rate of application - the frequency with which the interventions are applied.

The present study also revealed important nuances of convergence. Future research should attempt to articulate the different aspects of convergence. The present study was able to discover the existence of two different aspects of convergence: adaptiveness and directionality. It will be important to discover the factors underlying the occurrence of these different aspects. It will also be important to discover the concomitants of the different types of convergence. For example, when a therapist exhibits directional convergence, is rapport also being established. Many of the fundamental relationships between convergence and basic therapy phenomenon, e.g., transference are currently uninvestigated.

In closing it should be noted that the present study, and all other case grammar studies, has a serious limitation. This limitation is that it focuses on only one aspect of therapy, i.e., language. Furthermore, it focuses on only one aspect of language, i.e., the case relation. This unifactor focus is a "necessary evil" in the empirical study of psychotherapy. Of all the factors important in psychotherapy which are able to be studied in an empirical manner, language is the most viable variable. Future research will have to integrate the findings of language studies of psychotherapy with other psychotherapy studies focusing on nonverbal behavior, intrapsyche states and processes, and relationship variables.

## BIBLIOGRAPHY

- Adleson, J. and Redmond, J. Personality Differences and the Capacity for Verbal Recall. Journal of Abnormal and Social Psychology. 1958, 57, 244-249.
- Allport, G. W. Personality: A Psychological Interpretation. New York: Henry Holt, 1937.
- Anderson, R. B. W. A Markov Chain Model of Medical Specialty Choice. Journal of Mathematical Sociology. 1974, 3, 259-274.
- Angyal, A. Neurosis and Treatment: A Holistic Theory. E. Hanfmann and R. J. Jones, Eds. New York: Viking Press, 1971.
- Atkinson, R. C., Bower, G. H. and Crothers, E. J. An Introduction to Mathematical Learning Theory. New York: John Wiley and Sons, Inc., 1965.
- Auerswald, M. C. Differential Reinforcing Power of Restatement and Interpretation on Client Production of Affect. Journal of Counseling Psychology. 1974, 21, 9-14.
- Auld, F. and White, A. M. Rules for Dividing Interviews into Sciences. Journal of Psychology. 1956, 42, 273-281.
- Ayllon, T. and Houghton, E. Modification of Symptomatic Verbal Behavior of Mental Patients. Behavior Research and Therapy. 1964, 2, 87-97.
- Bandler, R. and Grinder, J. The Structure of Magic I. Palo Alto: Science and Behavior Books, 1975.
- Beiber, M. R., Patton, M. J. and Fuhrman, A. J. A Metalanguage Analysis of Counselor and Client Verb Usage in Counseling. Journal of Counseling Psychology. 1977, 24, 264-271.
- Benjamin, H. S. The Structural Analysis of Social Behavior and Markov Chain to Study Dyadic Interactions. Journal of Abnormal Psychology. 1979, 88, 303-319.
- Berez, W. An Investigation of Body Boundry, Body Cathexis and Body Awareness Aspects of Body Image in Obsessive Compulsive and Hysterical Personalities. Dissertation Abstracts International. 1979 (Jan.), 37 (7-b), 3595.
- Bergin, A. E. Some Implications of Psychotherapy Research for Therapeutic Practice. Journal of Abnormal Psychology. 1969, 71, 235-246.



- Bergin, A. E. The Evaluation of Therapeutic Outcome. In A. E. Bergin and S. L. Garfield (Eds.) Handbook of Psychotherapy and Behavior Research. New York: Wiley and Sons, 1969.
- Bergin, A. E. and Strupp, H. H. The Last Word on Psychotherapy Research: A Reply. International Journal of Psychiatry. 1969, 7, 160-168.
- Bergin, A. E. and Strupp, H. H. New Directions in Psychotherapy Research. Journal of Abnormal Psychology. 1970, 76, 13-26.
- Bergman, D. V. Counseling Method and Client Response. Journal of Consulting Psychology. 1951, 15, 216-224.
- Boring, E. G. A History of Experimental Psychology. New York: Appleton-Century-Crofts, 1950.
- Caine, T. M. Obsessoid and Hysteroid Components of Personality. In Personality and Personal Illness. G. A. Goulds, Ed. (London): Tavistock Publications, 1965.
- Caine, T. M. and Hawkins, L. G. Questionnaire Measure of the Hysteroid/Obsessoid Component of Personality. Journal of Consulting Psychology. 1963, 27, 206-209.
- Campbell, D. T. and Stanley, J. C. Experimental and Quasi-experimental Designs for Research. Chicago: Rand-McNally, 1963.
- Chafe, W. L. Meaning and the Structure of Language. Chicago: University of Chicago Press, 1977.
- Chassan, J. B. On the Development of Statistic Systems. Biometrika. 1959, 15, 31-40.
- Chassan, J. B. Stochastic Models of the Single Case as a Basis of Clinical Research Designs. Behavioral Science. 1961, 6, 425-438.
- Chassan, J. B. Research Designs in Clinical Psychology and Psychiatry. New York: Appleton-Century-Crofts, 1967.
- Chassan, J. B. On Psychodynamics and Clinical Research Methodology, Psychiatry. 1970, 30, 94-101.
- Chomsky, N. Syntactic Structures. The Hague: Mouton Publishing Co., 1957.
- Clark, H. H. and Clark, E. V. Psychology and Language: An Introduction to Psycholinguistics. New York: Harcourt, Brace and Jovanovich, Inc., 1977.
- Cook, W. A. A Set of Postulates for Case Grammar Analysis, Language and Linguistics. (Working Paper 4) Washington, D.C.: Georgetown University Press, 1972.

- Daugherty, R. C. Review Article: Recent Studies on Language Universals. Foundations of Language. 1970, 6, 505-561.
- Dittmann, A. T. The Interpersonal Process in Psychotherapy: Development of a Research Method. Journal of Abnormal and Social Psychology. 1952, 47, 236-244.
- Dukes, W. F. N=1. Psychological Bulletin. 1965, 64, 74-79.
- Duncan, S., Rice, L. N. and Butler, J. M. Therapist's Paralanguage in Peak and Poor Psychotherapy Hours. Journal of Abnormal Psychology. 1968, 73, 566-570.
- Edgar, E. and Billingsly, F. Believability When N=1. Psychological Record. 1974, 24, 147-160.
- Edgington, E. S. Statistical Inference from N=1 Experiments. Journal of Psychology. 1967, 65, 195-199.
- Falk, J. L. Issues Distinguishing Idiographic From Homothetic Approaches to Personality Theory. Psychological Review. 1956, 63, 53-62.
- Fillmore, C. J. The Case for Case. In E. Bach and R. T. Harms (Eds.) Universals in Linguistic Theory. New York: Holt, Rinehart and Winston, 1968.
- Fisher, D. F. and Keen, S. L. Verbal Recall as a Function of Personality Characteristic. Journal of Genetic Psychology. 1972, 120, 83-92.
- Foulds, G. A. Personality and Personal Illness. New York: Tavistock Publications, 1965.
- Frank, G. H. and Sweetland, A. A. The Study of the Process of Psychotherapy: The Verbal Interaction. Journal of Consulting Psychology. 1962, 26, 135-138.
- Freud, S. Collected Papers (1913). New York: Basic Books, 1959.
- Gottman, J. M. N-of-One and N-of-Two Research in Psychotherapy. Psychological Bulletin. 1973, 80, 93-105.
- Gottman, J. M. McFall, R. M. and Barnett, J. T. Design and Analysis of Research Using Time Series. Psychological Bulletin. 1979, 72, 299-306.
- Gottschalk, L. A. and Auerback, A. H. Methods of Research in Psychotherapy. New York: Appleton-Century-Crofts, 1966.
- Gray, L. N. and Broembsen, M. H. On Simple Stochastic Diffusion Models. Journal of Mathematical Sociology. 1974, 3, 231-244.
- Hersen, M. and Barlow, D. H. Single Case Experimental Designs: Strategies for Studying Behavior Change. New York: Pergamon Press, 1977.

- Hertel, R. K. Applications of Stochastic Process Analysis to the Study of Psychotherapeutic Processes. Psychological Bulletin. 1972, 77, 421-430.
- Hobby, A. K. A Study of Hysteroid and Obsessional Differences in Phenomenal Experience. Dissertation Abstracts International. 1979 (Feb.), 39, (8-b), 4033.
- Honigmann, J. J. Culture in Personality. New York: Harper and Row, 1967.
- Holt, R. Individuality and Generalization in the Psychology of Personality. Journal of Personality. 1962, 30, 377-404.
- Hope, K. and Caine, T. M. The Hysteroid/Obsessoid Questionnaire: A New Validation. British Journal of Social and Clinical Psychology. 1968, 7, 210-215.
- Hurndon, C. J., Pepinsky, H. B. and Mera, N. M. Conceptual Level and Structural Complexity in Language. Journal of Counseling Psychology. 26, 190-197.
- Inglis, J. The Scientific Study of Abnormal Behavior. Chicago, Aldine, 1966.
- Ingram, I. M. The Obsessional Personality and Obsessional Illness. American Journal of Psychiatry. 1961, 117, 1016-1019, (b).
- Jaffe, J. and Feldstein, S. Rhythms of Dialogue. New York: Academic Press, 1970.
- Janet, P. The Major Symptoms of Hysteria. London: MacMillian, 1970.
- Johnson, L. D. An Assessment of Stylistic Verbal Behavior in Response to Stress. Dissertation Abstracts International. 1976 (Nov.), 37 (5-6), 2489.
- Karlin, S. A First Course in Stochastic Processes. New Jersey: Academic Press, 1961.
- Katz, L. and Proctor, C. H. The Concept of Configuration of Interpersonal Relations in a Group as a Time-Dependent Stochastic Process. Psychometrika. 1959, 24, 317-326.
- Kazdin, A. E. Methodological and Interpretive Problems With Single Case Experimental Designs. Journal of Consulting and Clinical Psychology. 1978, 46, 629-642.
- Kemeny, J. G., Snell, J. L. and Thompson, G. L. Introduction to Finite Mathematics. New Jersey: Prentice-Hall, Inc., 1961.
- Kisler, D. J. Some Myths of Psychotherapy Research and the Search for a Paradigm. Psychological Bulletin. 1966, 65, 110-136.

- Kikes, J. T. Psychotherapy: Developing Approaches. New York: Basic Books, 1965.
- Korzybski, A. General Semantics, Psychiatry, Psychotherapy and Prevention. American Journal of Psychiatry. 1941, 98, 203-214.
- LaPalombara, L. E. An Introduction to Grammar: Traditional, Structural and Transformational. Cambridge, Mass: Winthrop Publishers, Inc., 1976.
- Lazare, A., Klerman, G. L. and Arm6r, D. J. Oral Obsessive and Hysterical Personality Patterns: Replication of Factor Analysis in an Independent Sample. Journal of Psychiatric Research. 1970, 7, 275-290.
- Leittemberg, H. The Use of Single Case Methodology in Psychotherapy Research. Journal of Abnormal Psychology. 1973, 82, 87-101.
- Lichtenberg, J. W. and Hummel, T. J. Counseling as a Stochastic Process: Fitting a Markov Chain Model to Initial Counseling Interviews. Journal of Counseling Psychology. 1976, 26, 310-315.
- Marceil, J. C. Implicit Dimensions of Idiography and Nomathesis: A Reformulation. American Psychologist. 1977, 200, 1046-1055.
- Meara, N. M. Pepinsky, H. B., Shannon, J. W. and Murray, W. A. Semantic Communication and Expectations for Counseling Across Three Theoretical Orientations. Journal of Counseling Psychology. 1981, 28, 110-118.
- Meara, N. M., Shannon, J. W. and Pepinsky, H. B. Comparison of Stylistic Complexity of the Language of Counselor and Client Across Three Theoretical Orientations. Journal of Counseling Psychology. 1979, 26, 181-189.
- Miller, G. A. Finite Markov Processes in Psychology. Psychometrika. 1952, 17, 149-167.
- Modansky, A. Least Square Estimation in Finite Markov Processes. Psychometrika. 1959, 24, 137-144.
- Morse, S. J. and Watson, R. I. Psychotherapies: A Comparative Casebook. New York: Holt, Rinehart and Winston, 1977.
- Parzen, E. Stochastic Processes. San Francisco: Holden Day, Inc., 1962.
- Patton, M. J., Fuhriman, A. and Bieber, M. R. A Model and a Metalanguage for Research on Psychological Counseling. Journal of Counseling Psychology. 1977, 24, 25-34.
- Paykel, E. S. and Prysoff, B. A. A Relationship Between Personality Dimensions: Neuroticism and Extraversion Against Obsessive, Hysterical and Oral Personality. British Journal of Social and Clinical Psychology. 1973, 12, 309-318.

- Pollak, J. M. Obsessive-Compulsive Personality: A Review. Psychological Bulletin. 1979, 86, 225-241.
- Ravah, H. Interaction Sequences. Journal of Personality and Social Psychology. 1965, 2, 487-499.
- Reber, A. S. On Psycholinguistic Paradigms. Journal of Psycholinguistic Research. 1973, 2, 289-319.
- Reich, W. Character Analysis (3rd edition) (T. P. Wolfe, Trans.) London: Vision, 1958 (originally published, 1933).
- Rice, L. N. Client Behavior as a Function of Therapist Style and Client Resource. Journal of Counseling Psychology. 1973, 29, 300-211.
- Rudstam, K. Semantics and Psychotherapy. Psychotherapy: Research and Practice. 1978, 15, 190-192.
- Russell, R. H. and Stiles, W. B. Categories for Classifying Language in Psychotherapy. Psychological Bulletin. 1977, 86, 404-419.
- Salansky, M. A. Isaacs, K. S., Levitov, E. S. and Haggard, E. A. Verbal Interaction and Levels of Meaning in Psychotherapy. Archives of General Psychiatry. 1966, 14, 158-170.
- Salzman, L. Psychotherapy of the Obsessoid. American Journal of Psychotherapy. 1979, 33, 32-40.
- Sandler, J. and Hazari, A. The Obsessional on the Psychological Classification of Obsessional Character Traits and Symptoms. British Journal of Medical Psychology. 1960, 33, 113.
- Shapiro, D. Neurotic Styles. New York: Basic Books, 1965.
- Shapiro, M. B. The Single Case in Clinical-Psychological Research. Journal of General Psychology. 1966, 74, 3-23.
- Sidman, M. Tactics of Scientific Research. New York: Basic Books, 1960.
- Southard, O. B. Topicalization of Case in English. Unpublished Ph.D. dissertation. Purdue University, 1972.
- Suppes, P. and Atkinson, R. C. Markov Learning Actions. Stanford: Stanford University Press, 1960.
- Strupp, H. H. and Bergin, A. E. Some Empirical and Conceptual Bases for Coordinating Psychotherapy Research. International Journal of Psychiatry. 1969, 7, 18-90.
- Templer, D. Obsessive-Compulsive Neurosis: A Review of Research. Comprehensive Psychiatry. 1972, 13, 375-383.

- Theios, J. Finite Integer Models for Learning in Individual Subjects. Psychological Review. 1968, 75, 292-307.
- Timmons, E. O. and Noblin, C. D. The Differential Performance of Orals and Anals in a Verbal Conditioning Paradigm. Journal of Counseling Psychology. 1963, 27, 383-386.
- Trager, G. L. Language and Psychotherapy in L. Gottschalk and A. Auerback. Methods of Research in Psychotherapy. New York: Appleton-Century-Crofts, 1966.
- Whorf, B. Grammatical Categories. In J. E. Carroll (Ed.) Language, Thought and Reality. New York. John Wiley and Sons, 1956.
- Yngve, V. H. A Model and an Hypotheses for Language Structure. Proceedings of the American Philosophical Society. 1960, 104, 444-446.
- Zimmer, J. M. and Pepyne, E. W. A Descriptive and Comparative Study of Dimensions of Counselor Response. Journal of Counseling Psychology. 1971, 18, 441-447.

APPENDIX A

FILMORE'S CASE RELATIONSHIPS

Initially, Fillmore (1968) specified six case relations: agentive, instrumental, experiencer, objective, goal and locative. He later expanded the number of case relations to nine with the addition of the source, time and extent case relations (Southard, 1972). A brief definition and example of each case relation is provided to familiarize the reader with the nine case relations.

1. Agentive - animate noun being the instigator of the action identified by the verb.
2. Experiencer - animate noun being the receiver of the action specified by the verb, e.g., John felt angry.
3. Instrumental - inanimate noun causally involved in the action specified by the verb, e.g., The key opened the door.
4. Objective - inanimate noun being the receiver of the action specified by the verb, e.g., The vase broke.
5. Source - the place of origin of the action identified by the verb, e.g., It came from Dallas by mail.
6. Goal - the place of termination of the action identified by the verb, e.g., He went to the store.
7. Locative - the location or spatial orientation of the action identified by the verb, e.g., The vase was on the shelf.
8. Time - temporal orientation of the state or action identified by the verb, e.g., I'll be ready after lunch.
9. Extent - the locational charge or temporal duration of the action identified by the verb, e.g., It rained all night.

Fillmore believed that the case grammar he described is empirically preferable to that proposed by Chomsky in Aspects of the Theory of Syntax (Daugherty, 1970). Chomsky states that the phrase marker is the essence of a sentence. Fillmore contends that this is an intermediate level between the empirically discoverable semantic deep structure (case



relations) and the observationally accessible surface structure. Kess (1976) maintains, however, that both approaches are flawed since speakers cannot represent all of their semantic knowledge in these syntactic structures.

APPENDIX B

HOQ

Read over each question and decide whether it is a true description of how you usually act or feel, then put a circle round the T (true) if the statement describes you or round the F (false) if it does not. Take your first reaction bearing in mind your usual way of acting or feeling. Do not miss any questions. There are no right or wrong answers.

- |   |   |   |
|---|---|---|
| 1. I find it hard to think up stories.  | T | F |
| 2. I like to wear eye-catching clothes.   | T | F |
| 3. I keep my feelings to myself.  | T | F |
| 4. I am slow in making up my mind about things because I weigh up all the pros and cons.        | T | F |
| 5. I am a moody sort of person with lasting moods.  | T | F |
| 6. I have rigid standards I feel I should stick to.   | T | F |
| 7. When I am working I like a job which calls for speed rather than close attention to details. | T | F |
| 8. I like to ask for other people's opinions and advice about myself.                           | T | F |
| 9. I don't feel awkward when meeting people because I know how to behave.                       | T | F |
| 10. I prefer to be popular with everyone than to have a few deep lasting friendships.           | T | F |
| 11. I cannot shake off my troubles easily even if I get the opportunity.                        | T | F |
| 12. I have a good imagination.  | T | F |
| 13. I keep quiet at parties or meetings.  | T | F |
| 14. I feel better after I've had a good row (quarrel) and got it off my chest.                  | T | F |
| 15. I am quick in sizing up people and situations.  | T | F |

- |     |  |   |   |
|-----|--|---|---|
| 16. | My mood is easily changed by what happens around me.   | T | F |
| 17. | My conscience seldom bothers me.   | T | F |
| 18. | I keep a place for everything and everything in its place.   | T | F |
| 19. | I am rather lacking in the social graces.  | T | F |
| 20. | I have the same friends now as I had years ago.  | T | F |
| 21. | It pleases me to be the center of a lively group.  | T | F |
| 22. | I like to show people exactly how I feel about things.   | T | F |
| 23. | The first impressions or reactions are usually the right ones in the end.                          | T | F |
| 24. | I do not mind if things turn out badly as long as I know I've done the right thing.                | T | F |
| 25. | I can lead more than one life in my imagination.   | T | F |
| 26. | I like discussing myself with other people.  | T | F |
| 27. | I do not show my emotions in front of people.  | T | F |
| 28. | When someone asks me a question I give a quick answer and look for the reasons later.              | T | F |
| 29. | If I am not in the right mood for something, it takes a lot to make me feel differently.           | T | F |
| 30. | I usually get by without having to worry about whether I have done the right thing morally or not. | T | F |
| 31. | One can understand most things without having to go into all the details.                          | T | F |
| 32. | It is important to be fashionable in your opinions, clothes, etc.                                  | T | F |
| 33. | My party manners are pretty good.  | T | F |
| 34. | The only friends I make I keep.  | T | F |
| 35. | If I happen to be upset about something, it seems to carry over into all I do for a long time.     | T | F |
| 36. | I cannot completely lose myself in a book or story.  | T | F |
| 37. | I like to sit in the background or in an inconspicuous place at socials, meetings, etc.            | T | F |

- |  |   |   |
|--|---|---|
| 38. I act out my feelings.   | T | F |
| 39. I wait until I am sure of all my facts before I make a decision.   | T | F |
| 40. I spend a good deal of time worrying about the rights and wrongs of conduct.   | T | F |
| 41. When going into a room or meeting someone for the first time I get a strong general impression first and only gradually take in the details. | T | F |
| 42. When meeting people I haven't met before I usually feel I make a rather poor impression.   | T | F |
| 43. It upsets me to leave friends and make new ones even if I have to.   | T | F |
| 44. When watching a play I identify with the characters.   | T | F |
| 45. My feelings about things and towards other people seldom change.   | T | F |
| 46. I do not like taking a leading part in group activities.   | T | F |
| 47. Mistakes are usually made when people make snap decisions.   | T | F |
| 48. If two people find they disagree about things, they should not try to carry on being close friends.  | T | F |

## HOQ SCORING KEY

<u>HOQ ITEM NUMBER</u>	<u>SCORING DIRECTION</u> <u>T = True F = False</u>
1	F
2	T
3	F
4	F
5	F
6	F
7	T
8	T
9	T
10	T
11	F
12	T
13	F
14	T
15	T
16	T
17	T
18	F
19	F
20	F
21	T
22	T
23	T
24	T
25	T
26	T
27	F
28	T
29	F
30	T
31	T
32	T
33	T
34	F
35	F
36	F
37	F
38	T
39	F
40	F
41	T
42	F
43	F
44	T
45	F
46	F
47	F
48	T

APPENDIX C

CONTACTS OF ELIGIBLE CLIENTS

The following is the text which was read to clients who scored nineteen or below on the HOQ and who were consequently eligible for the study.

"Hello, my name is Matt Ferrara. I am the graduate student in clinical psychology who is conducting the psychotherapy research at PSC. When you filled out the intake forms at PSC you also filled out a questionnaire for my study. It was a 48-item, true-false questionnaire. Do you remember it? Well, you are eligible to participate in the study. I was wondering if you would be willing to set up a time for us to get together so I could talk to you about participating in the study. It will be a brief meeting--about 15 minutes or so. How about \_\_\_\_\_?"  
(time)

#### Face-to-Face Contact With Eligible Clients

"What I would like to do at this time is give you more information about the study so you can make a decision about participating or not participating in the study. Is that okay?"

"First, I would like to emphasize that participation is completely voluntary. You can choose not to participate and this will in no way affect your status at PSC. You will still be able to see a therapist and talk about your problems. Further, if you do choose to participate but at some later time choose to withdraw from the study, or discontinue before it is over. You can do this. At this point you may wish to continue with the same therapist, switch therapists or even go to another agency. Your therapist and PSC will help you in any of these decisions. The important thing is that you get the services you feel you need. Your participation is voluntary and you have ultimate control in your role in this study. Do you have any questions?"



"In order to conduct this study each of your sessions will have to be audiotaped and transcribed for the purposes of analyzing them. In an effort to maintain confidentiality I will personally review the tapes and delete as much identifying material as possible. For example, I will erase all last names or any mention of specific locations, such as your home address. In this way this information will not be on the transcript, which will assure you of a greater degree of anonymity. You should be aware that both your therapist and I agree that we wouldn't want therapy material in the public realm. In the case of research we are even more adamant about this. It is necessary to protect you, us, PSC and the entire Psychology Department. Do you have any questions?"

"Another thing is that although this is a psychotherapy study, it will in no way curtail what you can talk about in therapy. You and your therapist will determine the goals you wish to achieve and the content of each session. The study will not interfere with your therapy, in fact, it is designed to improve the treatment you receive. Do you have any questions?"

"Finally, the nature of the study and all the details cannot be discussed at this time. To do so would bias the results of the study. The study itself is due to last six weeks. At the end of the study, or the end of your therapy, whichever comes first, your therapist will debrief you. Until that time, the study cannot be discussed with you in any great detail. Any questions?"

"As I have explained the study, I hope you can see that you have control over your participation and every attempt will be made to safeguard your anonymity. I would really appreciate it if you would help improve the quality of services provided in psychotherapy. I hope you

will take this opportunity to help. Do you want to participate in the study?"

If the Answer Was 'No'

"Thank you for considering participation. As I said, your nonparticipation will have no affect on the services you receive at PSC. The therapist who is assigned to your case will be getting in touch with you. You have some hesitations about the study. In that case I think your decision is correct and the only appropriate one. You must feel comfortable about the therapy setting if you are to get the optimal effects. I hope your therapy goes well. Thank you and good luck."

If the Answer Was 'Yes'

"Thank you for agreeing to participate. Your therapist will be contacting you within the next few days. I would like to give you a consent form to sign. This form is a written version of what we have discussed. It will be your written permission for me to audiotape your sessions and conduct the study. If you have any questions about the study, at any time, your therapist will be able to answer them, or I will make myself available to you. Please read the consent form carefully and if you can agree to it, sign here. Thanks for your help."

Telephone Contact of Ineligible Clients

The following was the text which was read to clients who failed to score nineteen or below on the HOQ and who were consequently ineligible for the study.

"Hello, my name is Matt Ferrara. I am the graduate student in

clinical psychology who is conducting the psychotherapy research at PSC. Because so few clients were required for the study we were not able to use all those who volunteered to participate. I would like to thank you for volunteering but I already have the necessary number of clients to conduct the study."

"I would like to emphasize that although I won't require your participation in my study, you are still eligible for therapy at PSC. In fact, you will be contacted in the near future by your intake therapist or a new therapist. At that time you can make arrangements for your meetings."

"I would also like to offer you the opportunity for feedback on the questionnaire that you filled out for this study. I hesitate to give feedback over the phone because I don't normally hold test result conferences in that manner and I don't think I want to start now. If you are interested we can get together at PSC for 10-15 minutes and go over the results."

"Once again, I want to thank you for volunteering and I hope that you continue to be as giving of yourself. Thank you."

## CLIENT CONSENT FORM

The study you are being asked to participate in is a psychotherapy study. The aim of this study is to develop some therapeutic techniques which will improve the effectiveness of therapy. The exact nature of study and the techniques which will be employed cannot be revealed at this time as it would bias the results of the study, however, the results will be discussed later. You should be aware that the techniques are not harmful or threatening in any way. After the study is complete, your therapist will inform you as to what the techniques are and what their purpose is.

In order to conduct this study, your sessions will have to be audio-recorded and transcribed. Every effort will be made to safeguard your tapes and transcripts. Only your therapist and I will listen to the tapes and read the transcripts. You will not be identified in an effort to maintain your anonymity. After the study is completed, there will be no way that your results can be associated with your name--confidentiality will be maintained. Of course, at some time in the study you may wish to withdraw your participation. This is perfectly legitimate and if you feel like doing so, I encourage it fully. Withdrawing participation from the study does not in any way mean that you cease to see your therapist; that is a different decision.

I hope you will participate in the study. It poses no threat to you and it may prove to be helpful. Confidentiality and anonymity will be maintained. This is a good opportunity for you to help and get help. If you have any questions, your therapist can answer them.

I agree to participate in the study.

---

Client's Name

---

Witness

## CLIENT DEBRIEFING FORM

The study you participated in was a psycholinguistic study of psychotherapy. That is, the study investigated the effects of language and language patterns on the effectiveness of your treatment. The therapist was instructed to watch for specific language behaviors which were designated as maladaptive. If the therapist detected any of these behaviors, she was instructed to help you restate what you said in a more adaptive manner. By a more adaptive manner, I mean a manner of talking by which it is easier for you to generate alternatives to your problems. The primary aim of this study was to devise a method of treatment to help you and other people as well. If you have any questions, your therapist will be happy to answer them. If you wish to see me for any reason, your therapist will coordinate a meeting time for us. Thank you for your help.

APPENDIX D

RULES FOR DIVIDING INTERVIEWS INTO SENTENCES

Dividing interviews into units is a necessary first step in case grammar analysis. The present study uses Auld and White's (1956) method for identifying sentences in an interview. There are nine rules which are used to identify sentences:

1. A sentence consists of an independent clause standing by itself or occurring along with one or more dependent clauses.
2. A clause is a statement containing a subject (explicitly stated) and a predicate, with or without complements or modifiers.
3. An independent clause can be distinguished from a dependent clause by the facts that (a) when two independent clauses are connected, the second may be introduced by a coordinating conjunction or a conjunctive adverb and (b) dependent clauses, which are always used as part of speech, are introduced by subordinating conjunctions or by pronouns such as who, which or that.
4. Some combinations of words without an expressed subject and predicate can make complete sentences. These are called elliptical sentences. Since the present study is concerned with the relationship of verbs and noun phrases, elliptical sentences will not be scored.
5. False starts, or anacolonthons, do not count as separate sentences.
6. Utterances lacking some essential feature of a complete sentence because of interruption by the other speaker or a lapse into silence are considered separate units when there is a subject and a predicate. Linguists call this construction "aposlopesis."
7. Affirmations and negations are not counted as separate units if the patient goes on to amplify. But if the affirmation stands alone, it is considered a separate sentence. For the purposes of the present



study, affirmations and negations which stand as complete units are not scored since they don't contain a subject and a predicate.

8. Phrases like "you know," "I guess" and "isn't it" when added onto sentences are not considered separate units.

9. If one independent clause is interrupted parenthetically by another independent clause, each is scored as a separate unit.

APPENDIX E

TEST FOR SIGNIFICANCE OF DIFFERENCE  
BETWEEN TWO PROPORTIONS

The form of the statistic used is that of a z-statistic. The numerator is the difference between the two proportions being compared. The denominator is similar to the standard error of the mean. It is comprised of the proportions being considered and the sample size. The statistic has the form

$$z = \frac{P_1 - P_2}{\sqrt{\frac{P_1(1-P_1)}{N_1} + \frac{P_2(1-P_2)}{N_2}}}$$

where

$P_1$  = proportion #1

$P_2$  = proportion #2

$N_1$  = sample size on which  $P_1$  is based

$N_2$  = sample size on which  $P_2$  is based

The distribution for the statistic is the  $N(0,1)$ . The significant levels for two-tailed tests are 1.96 at the .05 level and 2.58 at the .01 level.

VITA<sup>2</sup>

MATTHEW LUKE FERRARA

Candidate for the Degree of

Doctorate of Philosophy

Thesis: CASE GRAMMAR INTERVENTIONS FOR THE OBSESSOID

Major Field: Psychology

Biographical:

Personal Data: Born in Kansas City, Missouri, March 12, 1954, the son of Mr. and Mrs. Michael R. Ferrara.

Education: Graduated from Jesuit College Preparatory School, Dallas, Texas, in May, 1972; graduated from the University of Texas at Austin with high honors and special honors in Psychology, received a Bachelor of Arts degree in May, 1976; completed the requirements for a Master of Science degree at Oklahoma State University in July, 1979; completed the requirements for a Doctor of Philosophy degree at Oklahoma State University in July, 1982.

Professional Experience: Volunteer aide at the Austin State Hospital, Austin, Texas, September, 1975-May, 1976; Mental Health Aide at the Austin State Hospital, Austin, Texas, May, 1976 - May, 1977; Psychological Associate at Oklahoma State University Counseling Centers, Stillwater, Oklahoma, September 1977 - May, 1981; Instructor of Psychology at Oklahoma State University, September, 1977 - August, 1981; Federal Intern at the El Reno Federal Co-rectional Institution, El Reno, Oklahoma, May, 1978 - August, 1978; Psychological Associate at the Children's Medical Center, Tulsa, Oklahoma, September, 1980 - May, 1981; Psychology Intern at the Audie L. Murphy Veterans Hospital, San Antonio, Texas, September, 1981 - August, 1982.