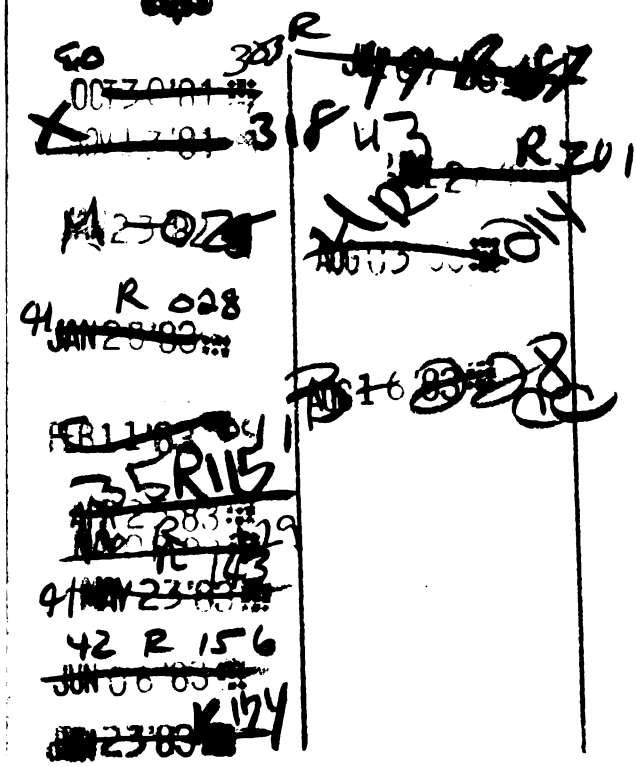

THE EFFECT OF INTERVIEWERS RESPONDING DIFFERENTIALLY TO SUBJECTS' REPRESENTATIONAL SYSTEMS AS INDICATED BY EYE MOVEMENT

By

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ABSTRACT

THE EFFECT OF INTERVIEWERS RESPONDING DIFFERENTIALLY TO SUBJECTS' REPRESENTATIONAL SYSTEMS AS INDICATED BY EYE MOVEMENT

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The major purpose of this study was to test the notion that: if interviewer-therapists responded with perceptual predicates congruent to the internal representational system of a subject-client, then the therapeutic relationship would be enhanced and subject-clients would report being understood. The concept of representational systems and eye movement patterns, developed by Grinder, DeLozier and Bandler in their book Patterns of the Hypnotic Techniques of Milton Erickson, M.D. Volume II (1977), served as the theoretical foundation for this study. Internal representational systems (visual, auditory and kinesthetic) can be identified by observing the eye movement(s) an individual makes when reflecting on experiences and by listening for the perceptual predicates an individual uses in his or her speech. Specific eye movement patterns apply only to right-handed individuals and to those who have not suffered severe head injuries.

Seventy-two undergraduate students at Michigan State University were considered the usable subject pool who voluntarily participated. These subjects, thirty-six men and thirty-six women, were randomly assigned to one of two treatment conditions: (1) a "congruent"

interview in which interviewers responded with perceptual predicates that matched the subject's representational system(s) as indicated by eye movement; and (2) an "incongruent" interview in which interviewers responded with perceptual predicates that mismatched the subject's representational system(s) as indicated by eye movement. All interviews were structured identically in format and content with only predicates varied according to condition. Four interviewers (two male and two female) were trained in the model of representational systems and in accurately identifying eye movements and responding with appropriate predicates. One male and one female interviewer were assigned to each of the two treatment conditions.

Data for the dependent variables of empathy, ease, anxiety, and hostility were collected after the interviews from subjects who completed three self-report instruments: (1) Barrett-Lennard Relationship Inventory--Empathic Understanding Scale; (2) Ease of Communication Inventory designed by the author; and (3) Multiple Affect Adjective Check List--Today Form.

These data were used to determine the interactions and main effects of the three factors (independent variables) in the research design: sex of interviewer, sex of subject, and condition. Seven hypotheses were designed to test these effects. Multivariate analysis of variance was used to analyze and test the data at the $p < .10$ level of significance. If the multivariate test resulted in significance, univariate tests were then conducted and tested at the $p < .025$ level to determine the variables upon which groups differed. For

those univariate tests with significance, post hoc procedures were then conducted to determine in what ways groups differed.

No significant three-way interaction was found. Analysis of the two-way interactions indicated that the sex of interviewer by sex of subject interaction was statistically significant ($p = .007$). Univariate tests indicated significance on the ease scale ($p = .001$). Male subjects were markedly more at ease in their communication with male interviewers than with female interviewers. Female subjects, however, appeared equally at ease with either male or female interviewers. Although not statistically significant on the multivariate test ($p = .118$), there was evidence for a condition by sex of subject interaction on the univariate test - ease scale ($p = .012$). Male subjects appeared markedly more at ease in the congruent condition than the incongruent condition. Female subjects, however, were not affected differentially by condition. Analysis of the main effects showed that only the main effect, sex of interviewer, was statistically significant ($p = .009$). Univariate tests indicated significance on the empathy scale ($p = .023$). Female interviewers were perceived as more empathic than male interviewers. Even though significant differences were found between male and female interviewers on empathic understanding, this did not facilitate ease in communication for either male or female subjects. The results of this study offer questionable support for the notion of increased rapport when interviewers respond to subjects' representational systems as indicated by eye movement.

to my parents

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CHAPTER I

THE PROBLEM

Introduction

Effective communication is important in the development of any relationship but it is particularly important in the "helping relationship." Effective communication is taken to mean "developing an ability to perceive sensitively and accurately the feelings and experiences" of another individual (Truax & Carkhuff, 1967, p. 143).

One of the first steps in effective communication is being able to understand the internal model another person has constructed for viewing their world and thus creating personal meaning in his or her life. Communicating this understanding of another's world in a language congruent with the person's experiences increases the feeling of being understood (Rogers, 1965). This internal frame of reference has been referred to as the person's map or internal representation of the world (Grinder & Bandler, 1976; Horowitz, 1978).

Research on imagery and the new insights made recently on the organization and functions of the human brain shed light on how a person selects and organizes all the available sensory data of the world into a meaningful representation. But how exactly does one go about understanding another's internal representation of the world? And how does one communicate in a way congruent with another's

experiences that conveys understanding of another's personal frame of reference?

A new theoretical perspective has been postulated in 1975 and 1976 by Richard Bandler and John Grinder integrating the areas of psychotherapy and communication, linguistics and neurological functioning into a model that describes how understanding and subsequent communication can be enhanced between individuals. These theorists suggested that any individual processes information and internally represents the world mainly through the visual, auditory and kinesthetic sensory systems. Gaining access to which sensory system(s) a person has used to construct his or her internal representations is crucial to the present study. Bandler and Grinder (1975, 1976), suggested two observable ways this can be done. By watching the non-verbal, reflexive eye movements an individual displays when reflecting on past experiences and by listening for the verbal components in his or her speech that reflect the visual, auditory and kinesthetic sensory systems, it can be determined which of the sensory systems is used to form and store internal representations of past and present experiences. This allows one to understand the process used by an individual for constructing their map or model of the world. Communicating in a language which reflects the sensory processes a person has used to organize his or her experiences increases understanding and subsequently builds rapport.

Very little research has been done and reported on this theoretical model to date. Therefore, it is the purpose of this study to explore what happens in the communication process between a "helper" who understands another's internal representational system and conveys this understanding in a language congruent to that representational system as opposed to conveying understanding in a language incongruent to that person's internal representational system. Specifically, what is the effect on perceived understanding and ease of communication when "helpers" respond differentially to representational systems as indicated by the reflexive eye movements an individual displays when reflecting on past experiences?

Importance of the Study

As mentioned earlier very little empirical research has been reported thus far on the particular theory upon which this study is based. If the anticipated findings of this study are realized, they could have significant implications for the therapeutic relationship and for the process of therapy in general. There is a need for a practical, easy-to-learn tool that therapists can use to enhance and communicate their specific understanding of another's internal frame of reference. The method of identifying internal representational systems is based on the easily observable behaviors of eye movement and therefore offers another advantage. In addition, therapists may enrich their own current resources by implementing this method of understanding internal representations. As long as knowledge of internal representations is viewed as an important aspect of therapy,

the theory can conceivably be applied by different therapists regardless of theoretical orientation.

Purpose

The purpose of this study is to test the notion that as therapists respond within the representational system(s) a client is using to store experience there will be an increase in that client's self-report of being understood and being at ease in the communication. Specifically, two sets of interviewers will be trained to reliably identify eye movements of subjects and respond by using one of two conditions. One set of interviewers will be trained to respond to eye movements using perceptual predicates that are congruent with the movement and the underlying representational system. The other set of interviewers will be trained to respond to subjects' eye movements using perceptual predicates that are incongruent with the representational system being used by the subject.

All interviews will be identically structured and all questions or statements will be presented to facilitate a search of stored information in the subject. Interviewer responses to the subjects' eye movements will vary only in the use of perceptual predicates. It is anticipated that those subjects in the congruent condition will report higher scores in being understood and at ease in the communication than those subjects in the incongruent condition.

Research Hypotheses

The following hypotheses form the basis of this study and are presented in statistical terminology in the chapter on Research Design and Methodology.

Hypothesis I:

> Subjects in the congruent condition will report significantly higher scores on perceived empathy than subjects in the incongruent condition.

Hypothesis II:

> Subjects in the congruent condition will report significantly higher scores on perceived ease of communication during the interview than subjects in the incongruent condition.

Hypothesis III:

> Subjects in the congruent condition will report significantly lower scores on anxiety than subjects in the incongruent condition as measured by items on the Multiple Affect Adjective Check List -- Today Form.

Hypothesis IV:

> Subjects in the congruent condition will report significantly lower scores on hostility than subjects in the incongruent condition as measured by items on the Multiple Affect Adjective Check List -- Today Form.

Definition of Terms

The following are definitions of terms in this study:

Representational System: "Ways of representing our experience of the world" (Grinder & Bandler, 1976, p. 6). There are several

ways to represent our experiences. These include creating images in the visual, auditory and/or kinesthetic sensory systems as well as certain sets of words in the English language.

Primary Representational System: "The representational system the person typically uses to bring information into consciousness--that is, the one he typically uses to represent the world and his experience of himself" (Grinder & Bandler, 1976, p. 26). The use of a primary representational system does not preclude the use of other sensory systems to represent experience. It merely reflects the system the individual tends to use consciously.

Lead System: A representational system that is not available to a person's consciousness but which has been used to store and represent sensory experience. The detection of a lead system is possible through observation of initial and secondary eye movements when compared with verbalizations. The initial eye movement is usually the unconscious representation; the secondary eye movement is the conscious representation.

Visual Representational System: The way of representing internal experience through generation of visual images or pictures.

Auditory Representational System: The way of representing internal experience through the use of sounds, voices or internal dialogue.

Kinesthetic Representational System: The way of representing internal experience through the use of feelings or bodily sensations.

Predicates: "Verbs, adjectives and adverbs in the sentences which the client uses to describe his experience" (Grinder & Bandler, 1976, p. 9).

Visual Predicates: Predicates which presuppose internal visual representations. Words such as "see," "picture," "bright," "shining," "view," "look," "perspective" are examples.

Auditory Predicates: Predicates which presuppose auditory internal representations. Words such as "say," "sound," "hear," "squeal," "talk," "harmonize" are examples.

Kinesthetic Predicates: Predicates which presuppose a kinesthetic way of representing experience internally. Words such as "touch," "feel," "soft," "hold," "grasp," "handle" are examples.

Non-Specified Predicates: Predicates or process words which presuppose no particular representational system. Words such as "think," "learn," "know," "remember," "experience" are examples. These predicates can be interpreted in any representational system.

Eye Movement: The direction in which the eyes move in response to a stimulus cue. Specific eye movement patterns developed by Grinder et al. (1977) and Cameron-Bandler (1978) are discussed in Chapter III.

Assumptions and Limitations of the Study

The one major theoretical assumption which underlies this study is that the representational systems individuals use to organize their experiences do in fact exist as postulated by the developers of the theory. Data from imagery and neurological studies will be discussed in Chapters II and III to support this assumption.

It is also assumed that right-handed individuals are lateralized consistently with the left hemisphere dominant for speech and sequential processing and the right hemisphere dominant for spatial relationships and simultaneous processing. Left handers are not assumed to have consistent lateralization and thus will not be included in this study.

Individuals who have had severe head injuries where consciousness was lost for a period of time are assumed to have suffered neurological damage. These individuals will be excluded from this study.

Theory

Although the theory from which this study derives will be described in detail in Chapters II and III, a brief overview will be presented here. Grinder and Bandler (1976) have developed a theory which integrates the areas of linguistics, imagery, neurology and psychotherapy. Their theory states that human beings create patterns out of incoming sensory stimuli and organize their perceptions in a way that provides meaning and direction to their lives. As Bandler and Grinder (1975) stated, "We as human beings do not operate

directly on the world. Each of us creates a representation of the world in which we live--that is, we create a map or model which we use to generate our behavior" (p. 7).

Perception is thus viewed as an active process which results in creating what has been described as internal representations, images, maps or models of the world (Gordon, 1972; Grinder & Bandler, 1976; Horowitz, 1978). These internal representations do not convey all that actually happened; they merely reflect an individual's viewpoint of how they've interpreted the situation or what they believe has happened. For any given situation then, two people may have entirely different perceptions of that situation based on what portions of that experience they each attended to and were most aware of. Representational systems are used not only to encode and organize experience but they are also used to decode and recall experiences. Gaining access to the representational processes an individual has used for creating his or her map and bringing into awareness other representations not conscious to the individual are two important aspects of the therapeutic process.

As Rogers (1965) stated from his client-centered model of therapy, the therapist needs "to assume, insofar as he is able, the internal frame of reference of the client . . ." (p. 29). To do so, the therapist must find ways that will allow him or her access to material that is both consciously and unconsciously represented by the client. It has been suggested by various therapists that this is done by listening carefully to how and what the client is saying as well as not saying, and listening to how the client perceives

and conceptualizes experiences and relationships (e.g., Mueller, 1973).

As Mueller (1973) pointed out, "the perceptual process of a client provides the therapist with an important avenue to understanding the client" (p. 19). Not only is understanding of the client's perceptual process important to the therapeutic relationship, it also gives the therapist information about the client's limitations and the ways he or she has distorted the world. Mueller (1973) further stated, "clients perceive what they need to perceive in order to maintain some semblence of unity without suffering undue anxiety. A client sees what he wants to see, what he needs to see, and he avoids seeing those things he cannot afford to see because they are too dangerous" (p. 20). A client, then, who ignores a great deal of the available perceptual information because it does not fit into his or her order of the world becomes impoverished and loses the satisfaction and richness that life can offer.

One of the tasks of the therapeutic process is to change the client's current way of perceiving and to open up new perspectives. As Rogers (1965) stated, "therapy is basically the experiencing of the inadequacies in old ways of perceiving, the experience of new and more accurate perceptions, and the recognition of significant relationships between perceptions" (p. 77). This process entails bringing into awareness rich, primary experiences which have been stored away unconsciously.

How, specifically, can therapists tap this information in the client? Bandler and Grinder (1975) suggested that this necessary

information on exactly how a person has perceived and conceptualized his or her experience can come from watching and responding to the person's eye movement patterns and listening for and responding to specified perceptual predicates in the client's speech. People represent their experiences using any of the sensory modalities but primarily use the visual, auditory and kinesthetic sensory modalities. These representations can take the form of images or can be expressed in specific process words (called perceptual predicates) that presuppose the underlying visual, auditory and kinesthetic sensory modalities.

Often, however, people find it easy to disguise even to themselves, what they're experiencing by using words that do not specify the kinds of processes they're employing to organize their experiences (Horowitz, 1978). It is then up to the therapist to find ways to discover these processes and communicate understanding and acceptance of these processes (Rogers, 1965). Gordon (1972) and others have suggested that using imagery in therapy is one way to gain access to stored sensory information.

As pointed out in this discussion, if the therapist actively pays attention to both the verbal and non-verbal cues offered usually unconsciously by clients, the therapist gains a greater understanding of the client's internal frame of reference. In their research efforts over a period of several years, Rogers (1965), Truax and Carkhuff (1967) and Carkhuff (1969) have defined a model for therapy that identifies the therapist's knowledge of a client's frame of reference as crucial to the therapy process and to the

development of the therapeutic relationship. They have identified conditions basic to the process of therapy and have defined important interpersonal skills that therapists need in order to enhance the relationship between therapist and client. One of the "necessary but not sufficient conditions" for developing the therapeutic relationship is for the therapist to be able to respond to a client with "accurate empathic understanding." This is operationally defined as the "sensitivity to moment to moment feelings during the therapy session and the verbal facility to communicate this understanding in a language attuned to the client's current feelings" (Truax & Mitchell, 1971, p. 318).

While Rogers (1965), Truax and Carkhuff (1967) and Carkhuff (1969) have built a strong foundation for the process of therapy which includes the notion that accurately understanding and conveying acceptance of a client's frame of reference and feelings enhances rapport between client and therapist, Bandler and Grinder (1975, 1976) have expanded and altered this model. They include even more specific elements that describe the actual processes a client uses to form his or her "frame of reference." They emphasize the use of all the sensory modalities but especially the visual, auditory and kinesthetic systems in creating internal representations of external events. Bandler and Grinder (1975, 1976) also describe explicit techniques that make use of specific observable behaviors (eye movement patterns and perceptual predicates) that therapists can use to accurately identify and understand even verbally disguised internal representations. With the implementation of Bandler and

Grinder's theory of representational systems, a therapist can even more accurately identify and convey understanding of a client's "frame of reference" or map used to guide his or her behavior in the world.

The theory proposed by Bandler and Grinder (1975, 1976) has focused on identifying specific behaviors that can be readily observed to understand a client's internal representational system(s). These behaviors are the eye movement patterns that clients display when reflecting on past experiences and the perceptual predicates that clients use in their speech to describe those experiences. They conclude that if therapists respond with perceptual predicates that assume the same underlying representational system as a client is using, the client's belief that he or she is understood will be strengthened.

Overview of the Study

There appears to be a need for a study to test the notion that as therapists respond within the representational system a client is using when reflecting on past experiences, there will be an increase in that client's self-report of being understood. The theory underlying this notion was briefly examined. The definition of terms used in this study have been presented and the research hypotheses stated.

In Chapter II, the theoretical assumption that representational systems do in fact exist as described will be explored in more detail and in Chapter III, the pertinent literature is reviewed. In

Chapter IV, the population and sample are described; the procedures, instrumentation and design employed for analyzing results is presented. Chapter V is devoted to reporting and analyzing the results of this investigation. Chapter VI is a summary of the study, a discussion of the findings and suggestions for additional research in the area of eye movements and representational systems.

CHAPTER II

THEORY

This study is based on the theoretical assumption that representational systems as described by Grinder and Bandler (1976) do in fact exist. The purpose of this chapter is to review the research on imagery and perception relevant to this assumption. Woven into this review are the techniques postulated by Grinder et al. (1977) and Cameron-Bandler (1978) that are used to identify representational systems--namely, the reflexive eye movement patterns an individual displays when reflecting on experiences and the perceptual predicates an individual uses to describe his or her experiences. The use of these techniques in the process of therapy and in the development of the therapeutic relationship is discussed.

Eye Movements and Perceptual Predicates

Eye movement patterns and "perceptual predicates" are two observable behaviors that are assumed to indicate the representational system being used by an individual at any given moment. From their clinical observations, Grinder et al. (1977) and Cameron-Bandler (1978) noted that right-handed people moved their eyes in certain directions when asked to recall or reflect on past experiences. They linked specific eye movements observed to the visual,

auditory and kinesthetic sensory modalities and found that certain eye movements facilitate a search of stored sensory-perceptual information that can be accessed and brought into conscious awareness.

Specifically, they have suggested the following eye movements in right-handed individuals who are accessing stored perceptual information: (1) eyes up and to the right when accessing visual constructed images; (2) eyes up and to the left when accessing visual eidetic images; (3) eyes defocused at midline when accessing either constructed or eidetic visual images; (4) eyes laterally right or left when accessing auditory images; (5) eyes down and to the left when accessing auditory images; (6) eyes down and to the right when accessing kinesthetic images.

When an individual is thinking about some past experience and is trying to recall it in some detail, it can be determined by observing their eye movement which sensory system(s) has been used to encode that experience. Since eye movements are of major interest in this study, further discussion of the link between eye movements and the visual, auditory and kinesthetic sensory modalities will be reviewed in detail in Chapter III.

Another indicator of representational systems is a set of words in the English language called "perceptual predicates" (Grinder & Bandler, 1976) that an individual uses when talking about his or her experiences. Perceptual predicates are the verbs, adverbs and adjectives in speech which describe "those portions of experience an individual is consciously aware of" (Cameron-Bandler, 1978, p. 36).

These process words are also linked to the visual, auditory and kinesthetic sensory modalities and are used as descriptors for conveying the sensory process involved in experiencing events or situations in the world.

Examples of perceptual predicates that presuppose a visual sensory modality include: "picture," "bright," "flash," "color," "see," "focus," "perspective," "view." Examples of predicates that presuppose an auditory system include: "hear," "shout," "screech," "loud," "tune," "harmonize." Examples of predicates that presuppose a kinesthetic system include: "feel," "warm," "grasp," "handle," "smooth" (Cameron-Bandler, 1978, p. 37). When an individual uses perceptual predicates that presuppose a particular sensory modality, it can be assumed that the person is using a particular way to represent their experience. Listening for the predicates that clients use can be a useful technique for therapists to gain a greater understanding of how their client perceives and conceptualizes the world.

There are other words in the English language that describe the process of thinking but do not presuppose any particular sensory modality. These words are referred to as "unspecified process words" and include: "think," "know," "learn," "understand," "trust," "believe" (Cameron-Bandler, 1978, p. 38). When an individual uses unspecified predicates, it is necessary to ask for more information directed toward identifying the process they have specifically employed for structuring their experiences. In doing so, the therapist not only gains a greater understanding of the client's

model of the world, but also the client gains access consciously to specific ways he or she construes the world.

Imagery

The study of imagery was a major research focus during the late 19th century and early 20th century. The intent of the research at that time was to discover the nature of consciousness and the internal resources that individuals used to help them solve tasks and conceptualize their experiences. Subjective reports were relied upon heavily to the exclusion of studying behavioral actions which could be observed objectively. Because of the emphasis placed on individual differences as a result of subjective reports, psychologists became wary of the use of imagery as a way to find descriptions of trends and similarities between people. Thus, interest in imagery research waned and the focus turned toward studying behaviors and actions that could be objectively observed and measured. It was not until two decades ago that interest in imagery surfaced once again and a "subjective behaviorism" approach emerged (Miller, Galanter & Pribram, 1960).

Much of the recent imagery research has focused primarily on visualization and to some extent on audition. The current focus on the visual image leads one to believe that imagery is only a visual experience when, in fact, imagery has been found to include all the sensory modalities (Galton, 1907). Although his own work focused on visual images only, Horowitz (1978) defined an image as "any thought representation that has a sensory quality. Images can involve the

senses of seeing, hearing, smell, taste and movement" (p. 3). He stressed also that an image is an internal representation of external events, not an exact replica of external reality. Gordon (1975) agreed with this definition and made a similar distinction between images and percepts. She said "an image is the perception of forms, or colors, or sounds, or smells, or movements, or tastes in the absence of an actual external stimulus. Though such external stimulus may have presented itself in the past, it is not there at the time when the image occurs" (p. 13).

Imagery and Perception

Although theorists differentiate between perception and images, they are also very closely linked to one another. Perception is a complex process consisting of the occurrence of an external event combined with the way an individual subjectively experiences and judges that event. Perception includes the process of how an individual attends to external events as well as the process of making personal meaning out of external stimuli. How an individual attends to the external event and subsequently represents his or her experience of 'external reality' can be both influenced by and take the form of an image. As Gordon (1975) said, "what we 'see' is the result of a combination of the actual qualities possessed by an object plus all the expectations, needs, hopes and wishes of the participant" (p. 13).

The interaction of external events with internal experience was demonstrated by Perky (1910) and later replicated by Segal (1971).

Perky (1910) asked subjects to imagine visually an image of an object that had been projected onto a screen previously. While subjects conjured up the image, the investigator at the same time flashed a very faint picture of the object onto the screen which subjects faced. She found that in so doing most subjects were unable to identify the fact that an external stimulus had been presented. Subjects fused their visual images with the visual stimulus. Segal (1971) replicated this experiment and found the same results. When subjects were asked to image a particular object as though it were appearing on a blank screen while a picture of that object was projected faintly on the screen at the same time, subjects were not aware of the 'real' stimulus in the visual field.

Segal (1971) tested this image-percept phenomenon using both the visual and auditory sensory modalities. In both modalities, she found that subjects were blocked from perceiving the 'real' stimulus that was presented in the same sensory modality the subjects were using to form their images. She concluded that imagery and perception seem to use common pathways in the brain to process information of the same modality. Thus, images and percepts cannot easily be separated out from one another. External perceptual events influence the formation of images and at the same time image representations influence how an individual consciously attends. Perception involves the process of representing external stimuli in a way that carries meaning for an individual. At the same time, the types of representations formed earlier influence what is presently brought into awareness.

In an experiment on daydreaming, Antrobus et al. (1970) found when subjects were asked to process external visual stimuli, they reported few visual daydreams yet continued to report a consistent number of auditory daydreams. When subjects focused on processing external auditory signals, they reported few auditory daydreams yet continued to report the same amount of visual daydreams that they had reported before the presentation of the auditory stimulus. These results throw further light on the interaction of external stimuli and internal thoughts. The same conclusion can be drawn that common pathways in the brain seem to be used to process both images and percepts of the same modality. Yet this experiment also seemed to demonstrate that a limitation exists on the amount of information that can be processed consciously at any one time whether that stimuli is internal or external.

Representational Systems

External stimuli impinge on human beings all the time every day. People can be bombarded with all the sights, sounds, feelings, tastes and smells of living. In order to survive the constant stimulation, the physiological structure of the sensory systems is designed to reduce the amount of useless, irrelevant information individuals receive by alerting us only to changes that occur in the environment (Ornstein, 1977). Individuals also selectively respond to the stimuli entering the sensory systems by categorizing and organizing the incoming data in a way that is meaningful and relevant to physical survival and psychological aims and goals. Attention is

directed toward gathering the information most relevant at the present moment. Perception is thus viewed as an active process of making patterns out of all the available information in the world. This pattern-making is described as creating internal representations, maps or models of the world (Gordon, 1972; Grinder & Bandler, 1976; Horowitz, 1978).

Even though individuals consciously attend to certain information from the environment, this does not mean that other stimuli do not enter the sensory systems. It does mean, however, that some sensory input does not enter consciousness and is thus processed and stored unconsciously or is held in abeyance until attended to at a later time (Gordon, 1978). For example, most individuals are not aware of tastes and smells as often as they are aware of sights, sounds or feelings (body sensations). Furthermore, orienting spatially and communicating to others in the environment calls for the visual, auditory and kinesthetic systems much more often than either the gustatory or olfactory systems. The present discussion will be limited to the visual, auditory and kinesthetic sensory modalities. These are the systems most often used consciously to gather relevant information and store experience (Grinder & Bandler, 1976).

An individual's cognitive ability to consciously process all the available perceptual information is limited. To handle the incoming sensory stimuli, Miller (1956) described a process of "organizing or grouping the input into familiar units or chunks" (p. 93). Since human beings can only attend to and process a few "bits" of information at any one time, the process of chunking these

"bits" into larger units facilitates our capacity to assimilate new material. These chunks are then stored in memory and coded so that an individual may retrieve the information at a later time when it becomes necessary for survival. The study on daydreaming by Antrobus et al. (1970) discussed earlier seemed to demonstrate this limitation on conscious awareness.

Given that it is necessary for human beings to chunk sensory information together, how is this done? Imagery is one of the methods used to represent and code sensory experiences. Horowitz (1978) referred to 'image representations' as one of three forms of thought for processing sensory input and constructing inner models of the external world. He proposed that thinking in images is often a preferred mode of thought since images are so closely linked with perceptions and images retain the affect associated with the original experience. When images are brought into consciousness at a later time, "it allows memories to be treated 'as if' they were current experiences" (p. 85). Singer (1974) also referred to the importance of imagery for organizing and coding information. He said images formed in any one of the "specific sensory modalities are one of several major coding systems the brain has for organizing and storing experience" (p. 218). Storing sensory input in images allows for rapid processing and categorizing. The subsequent retrieval of a wealth of information about the original experience becomes available including the associated affect. Gordon (1972) described this same process of using imagery to "arrange the multiplicity of sensory stimuli into meaningful patterns" (p. 79). Images help in the

cognitive development of an individual by allowing emotions to be abstracted and stored until a later time when their release is appropriate to the present situation. She further stated that by forming images, an individual can be free from having to depend solely on the presence of external stimuli. When external events do occur, images can allow an individual to compare his or her "present perceptions with past experience and tolerate present frustrations for the sake of future satisfactions" (p. 79).

The process of forming internal representations, then, starts with information received through the five senses of hearing, seeing, feeling, tasting, smelling. Each of these sensory channels has associated with it a system that organizes, codes and stores memories of current experiences. These coded memories influence what the individual further attends to in his or her environment. In this way, an individual brings his or her internal, subjective ways of organizing data into play with new external stimuli. Using the "sensory systems as perceptual systems" (Gibson, 1966), individuals create images using the incoming sensory information to help structure and make meaning in their lives. At the same time, these newly formed images also distort the world so that no one ever perceives exactly what exists. Images, therefore, are not external reality; rather they are a person's subjective experience and organization of 'reality.'

Primary Representational System

Bandler and Grinder (1975) have suggested that not only do people use the visual, auditory and kinesthetic systems to organize their experience, but they also tend to rely on one sensory modality more often than the others for categorizing their experiences. The tendency to use either the visual, auditory or kinesthetic system depends on what an individual has learned in the past is the most meaningful way to sort out the incoming stimuli. This preferred system is called the person's most-valued, primary representational system.

Research on imagery supports this notion of a primary representational system by categorizing individuals according to certain characteristics of their imagery. In imagery studies, predominance of sensory modality refers to the frequency of using one particular sensory modality to form images. This does not preclude, however, the use of other sensory modalities for image formation. It merely refers to the frequency of use relative to other modalities. Galton's (1907) work on imagery led to the theory that each person could be classified according to the sensory modality employed to form images. For example, individuals could be classified as visualizers, audiles or kinesthetics. The method he used was a questionnaire which asked subjects to form images that tapped various modalities such as "an evenly clouded sky first bright, then gloomy" (visual); "the beat of rain against the window panes" (auditory); the "sensation of fatigue" (kinesthetic) (p. 256). He concluded that not only could people be classified into types but

also that people of different types react to situations differently, remember events differently and behave differently from each other.

Brower (1947) also studied the relative predominance of sensory modality in imagery. Subjects were asked to answer "yes" or "no" to questions which asked whether they could see, hear, feel, smell, and taste a pan of onions frying on a stove. His results indicated the following order of most frequently reported images: visual, auditory, tactual, tactuo-kinesthetic, thermal and olfactory.

In the Griffitts' (1927) test of imagery dominance, a list of seventy-five words and fifty phrases were used which each had the capacity to elicit images in several sensory modalities. He asked subjects to state whether they formed a visual image, an auditory image or a motor (kinesthetic) image upon presentation of words such as "bell," "dog," "storm," and phrases such as "a newsboy selling papers," "a child opening an umbrella," "a woman cutting paper with scissors" (p. 80). The results indicated that subjects formed mostly visual images, fewer auditory images and least of all kinesthetic images.

Using a similar format, Diehl and England (1958) used twenty words which were pretested and found to elicit images in the visual, auditory and kinesthetic modalities. For each word, if subjects reported an image in only one modality, a total of seven points was given for that word. If subjects experienced two or three modalities for a given word, they were to divide up a total of seven points between the modalities assigning a number indicating the relative predominance of each modality. Scoring for predominance entailed

tallying up the number of points for each modality and expressing the total as a percentage. Results were similar to those of other researchers. The visual mode was dominant for the majority of people, followed by the auditory and kinesthetic modes respectively. Diehl and England (1958) also explored imagery dominance in relation to undergraduate major. They administered their list of twenty words to students majoring in art, physical education, music and a control group from the general student population. Art majors reported more visual imagery than controls and physical education majors reported more kinesthetic imagery than controls. There was no significant difference, however, between music majors and controls in reporting auditory imagery.

Although predominance of sensory modality has been used to classify people, Richardson (1969) cautioned that people cannot be separated into discrete image types. He suggested an alternative typology which makes a distinction between individuals based on the vividness of their imagery. Vividness refers to a combination of clarity and liveliness. An image with unusual vividness closely resembles an actual percept (Sheehan, 1972). Individuals have been classified, then, as habitual visualizers or habitual verbalizers. This typology seems to reflect the difference in cognitive style employed by each of the hemispheres in the human brain as discussed in Chapter III.

Betts (1909) developed a lengthy questionnaire which was used to report vividness of images. He found that subjects who formed vivid images in the visual sensory modality also tended to form vivid

images in other modalities. Subjects who reported dim visual images also reported dim images in general. Sheehan (1967) developed a short yet reliable form of the Betts' (1909) questionnaire and confirmed these findings. He reported that people seemed to differ in terms of their vividness of imagery. Good imagers had vivid images across modalities while poor imagers had dim images in general.

Whether individuals report vivid or dim images, this may reflect the cognitive style used in constructing or forming images. As discussed later in Chapter III, the left hemisphere of the brain processes information sequentially while the right hemisphere processes information simultaneously. The effect of cognitive style employed may reflect the visualizer-verbalizer typology. This does not exclude, however, the use of the sensory modalities for forming images and thus representing the world internally in this form. It merely suggests that another system, namely language, can be used to represent experience as well.

Language as a Representational System

In addition to visual, auditory and kinesthetic images as internal representations of external reality, language can also be used to represent experience. However, attaching verbal labels to one's experience requires further abstraction and is thus more removed from representing the actual bits of sensory experience. Horowitz (1978) posited that lexical thinking serves the purpose of further classifying, abstracting and symbolizing experience. This creates more channel space for receiving and assimilating new

information. Language also allows individuals to communicate to others their conscious experience of the world.

Grinder and Bandler (1976) stated "by using our language representational systems, we are able to present our experience of any of the other representational systems" (p. 7). That is, human beings can use language in the same way that images are used--to create maps or internal representations of sensory input. The difference in using language as opposed to images to represent experience is that language is a higher order of cognitive development (Horowitz, 1978). It can be used as a representation of image representations or a map of our other internal image maps of the world. Language thus acts as a meta-system allowing individuals to comment about their experiences using verbal labels to reflect the underlying visual, auditory and kinesthetic sensory systems.

Use of Eye Movements and Predicates in Therapy

It has been suggested by Grinder and Bandler (1976) and Cameron-Bandler (1978) that observing eye movements and listening for the client's use of perceptual predicates will give the therapist a wealth of information regarding the processes used for organizing his or her experience of the world. If the therapist actively pays attention to these cues offered both verbally and non-verbally by the client, the therapist will be able to more accurately understand the world as the client 'sees' it, 'hears' it, and/or 'feels' it. Understanding the patterns a client has used for organizing his or her experience provides the therapist with information on how to be

helpful to the client. Before the therapist can begin to help the client reorganize those perceptual patterns and representations of the world that no longer provide satisfying outcomes in living, it is necessary to build rapport and convey to the client that their current way of organizing their experience is understandable. Grinder and Bandler (1976) suggest this is done by using perceptual predicates which are congruent with the client's current ways of perceiving the world. Knowledge of representational systems, then, is useful for developing the necessary rapport between client and therapist, as well as for pointing out what needs to be changed in order for the client to live a more rewarding and satisfying life.

As discussed earlier, representational systems can be expressed in the form of visual, auditory, or kinesthetic images and in the form of perceptual predicates which presuppose the underlying sensory system involved. Both forms of creating and storing representations of the world are important to the process of therapy. This notion of understanding the client's internal representations or 'frame of reference' in order to facilitate change is supported by numerous theorists in the field of psychotherapy.

In general, Gordon (1972) reported that nearly all psychotherapeutic approaches rely on both verbal and non-verbal communication for gathering information. Imagery, in particular, has been used for re-creating crucial parts of a client's inner world so the individual can re-live in the therapeutic relationship significant past events and experiences. Imagery can allow a client to compare present 'reality' with the beliefs and ideas carried from past

experiences. It is also valuable for re-surfacing buried affect that has been stored with the image (Horowitz, 1978).

Analysts including Freud (1924) and Jung (1959) used images to gain access to repressed mental contents. They each used the technique of free association and encouraged clients to report spontaneously any memories that surfaced. Jung (1968) advocated that clients re-dream their dreams in the therapy session and re-experience them imaginally by reporting an overall, general reaction to the dreams. Even many of the behavior modification techniques advocate the production of images since Wolpe (1958) first used imagery in his desensitization methods.

The theory developed by Grinder et al. (1977) and Cameron-Bandler (1978) which stresses the importance and meaning of both verbal and non-verbal behavior patterns (particularly perceptual predicates and eye movement patterns) gives the therapist specific tools to use. As Gordon (1972) noted about the therapist, "where his capacity to image is limited, there he fails to comprehend with ease the experience of his patient. In fact, he may be tempted to disregard, disbelieve or dismiss those experiences of his patient which his own imaginal disposition does not allow him to share" (p. 73). By actively watching the non-verbal messages the client displays, particularly eye movement patterns, the therapist whose own imagery is limited can gain an understanding of the client's model of the world which he or she uses to guide his or her life. The use of imagery allows the client to recognize that there is a

great deal of valuable information stored internally which can be used to enrich and enhance one's life.

Horowitz (1978) commented that "often, when trust has not developed, the typical verbal style of therapy is limited in finding out diagnostic information because people have a keen ability to censor verbal communication" (p. 330). Listening for the perceptual predicates clients use in their speech and watching the eye movements clients display open up new "avenues to understanding" (Mueller, 1973) the client and facilitating the therapeutic relationship.

Summary

In this chapter, an attempt has been made to draw the links between that portion of the model for psychotherapy postulated by Grinder, DeLozier and Bandler (1977) and Cameron-Bandler (1978) regarding representational systems and imagery. It was noted that perception is a complex process which involves organizing sensory input into meaningful patterns for the purpose of providing individuals with an inner map that is used to guide and direct their lives. This internal representation can take the form of images and can be expressed in the sensory modalities of vision, audition, and kinethesis. The relationship of image representations to language was discussed and linked to the therapy relationship.

Chapter III will be devoted to a review of the literature relevant to the eye movement patterns developed by Grinder et al. (1977) and Cameron-Bandler (1978). Since there are only two

reported studies on their theory, this review will include research on the two cerebral hemispheres of the human brain and the nature of cognitive processing.

CHAPTER III

REVIEW OF LITERATURE

The purpose of this chapter is to discuss the research relating to the cognitive styles of thinking employed in the two cerebral hemispheres of the human brain and review specific studies on the visual, auditory and kinesthetic sensory modalities. Research on lateral eye movements will be reported and the postulated theory of eye movements will be discussed in light of research on orienting and attentional mechanisms.

Cerebral Asymmetry and Cognitive Modes

Although Grinder, DeLozier and Bandler (1977) and Cameron-Bandler (1978) do not define the thinking involved in the construction of their model linking eye movement patterns to visual, auditory and kinesthetic sensory modalities, some of the theory can be understood in light of the recent research on the cerebral asymmetry of the human brain.

The cerebral cortex in human beings is divided into two cerebral hemispheres commonly referred to as the left or major (dominant) hemisphere and the right or minor (non-dominant) hemisphere. A bundle of nerve fibers called the corpus callosum connects the two halves of the brain. Although the normal human brain looks

anatomically symmetrical, it has been observed that each cerebral hemisphere tends to specialize in performing certain functions and each hemisphere seems to receive, process, encode and conceptualize sensory information in different ways before relaying this information to other parts of the brain (Dimond, 1978).

Ornstein (1977) provided a review of the specialized functions and modes of thinking for the two cerebral hemispheres. He reported that the left hemisphere in right-handed individuals controls the right side of the body and tends to be dominant for language and speech. The mode of thinking characteristic of the left hemisphere is logical, verbal, analytical and sequential in processing information. The right hemisphere controls the left side of the body and tends to be dominant for spatial relationships. The mode of thinking that characterizes the right hemisphere is more diffuse, holistic and simultaneous in processing information. It has the capacity to synthesize diverse inputs into a combined whole.

Thus it can be said that the left hemisphere specializes in perceiving and processing components of speech and language as well as controls the movements of the contralateral (right) side of the body. Contralateral movements not only refer to arm and leg movements of the right side but also to the right field of vision in both eyes. Objects perceived in the right visual field of each eye are directed exclusively to the left hemisphere. Conversely, the right hemisphere specializes in perceiving the spatial relationships between objects whether of an auditory or visual nature. It controls the movements of the contralateral (left) side of the body including

the left field of vision for both eyes. Objects perceived in the left visual field of each eye are projected exclusively to the right hemisphere.

Much research has been generated on the functions of the cerebral hemispheres. Since Dax in 1836 (Benton & Joynt, 1960) and Broca in 1861 (Broca, 1960) first observed that lesions in the left hemisphere produced speech difficulties in several patients, other patients with lesions to either the left or right hemispheres have been studied and reviewed in detail (Benton, 1962; Gardner, 1976). Since the mid 1950's, patients being treated for epilepsy by performing a surgical operation that separated the two cerebral hemispheres by disconnecting the fibers in the corpus callosum (split-brain operation) have been studied by Roger Sperry, Michael Gazzaniga, Joseph Bogen, Jerre Levy and associates and reviewed extensively (Gardner, 1976; Levy, 1974; Nebes, 1974; Ornstein, 1977). A third group of researchers since 1967 have been working with mental patients giving electro-shock treatments to one hemisphere of the brain at a time (Deglin, 1976). Finally, studies on normal people without brain damage or mental problems have also been reported. Some of the methods employed with normal people have included dichotic listening tasks where auditory material is presented to both ears simultaneously (e.g., Kimura, 1967), tachistoscopic presentations where visual material is presented to the right or left visual field and thus projected only to the left or right hemisphere respectively (e.g., Durnford & Kimura, 1971; McKeever, 1970), EEG

recordings of alpha activity (Galin & Ornstein, 1975) and lateral eye movements (e.g., Bakan, 1971; Kinsbourne, 1974).

Summarizing the results that are consistent from all of these studies, it has been found that each hemisphere can function independently of the other and can sense, perceive and conceptualize on its own even when disconnected surgically. Visual, auditory and kinesthetic sensory systems on either side of the body seem to pick up and receive different kinds of sensory information based on the kind of thinking or cognitive mode employed by each hemisphere. Recall that the left hemisphere operates in a logical, analytical and sequential manner (able to process information that is ordered in a sequence of time) which is the type of thinking involved in awareness of and use of language, verbal functions and sequences of movement. The right hemisphere operates in a holistic, gestalt, simultaneous manner (able to process many diverse inputs at the same time) which is the cognitive mode employed in synthesizing spatial relationships and musical arrangements. Each of the hemispheres, therefore, not only attends to and receives but also processes sensory information in a style congruent with its dominant cognitive mode. This organization of the hemispheres seems to hold true for 99% of right-handed individuals and for 56% of left-handed individuals (Levy, 1974).

Anatomical Structure of the Brain and the Sensory Systems

Dimond (1977) reported that visual, auditory and kinesthetic (body sensations) anatomical structures are located in each hemisphere of the brain and that these structures control the visual, auditory and kinesthetic sensory input and output received and processed in each cerebral hemisphere. The two occipital lobes of the cortex, located at the back of the brain, one in each hemisphere receive and process sensory input of a visual nature. The two temporal lobes of the cortex, located on either side of the cortex roughly above the ears, receive information of an auditory nature. The parietal lobes, located between the occipital and temporal lobes receive somatosensory information. Each of these lobes has nerve endings connecting them to both sides of the brain but the pathways connecting to the opposite (contralateral) hemisphere are apparently more effective than the pathways leading to the same side or ipsilateral hemisphere (Kimura, 1973). For visual input then, information in the right field of vision in both eyes is projected more effectively to the left hemisphere and information in the left field of vision is projected more effectively to the right hemisphere. The same holds true for auditory information received in the right and left ears. Information to the right ear is projected more strongly to the left temporal lobe while information to the left ear is projected more strongly to the right temporal lobe. Kinesthetic sensations on the right side of the body project more effectively to the left hemisphere and are more dominant than those on the right. Each of these

cortical zones of the brain also has an area associated with it which analyzes or interprets the incoming sensory data (Teyler, 1975).

The brain acts as a communication channel with the sensory structures receiving and processing the sensory input from the contralateral side first before relaying the information to other parts of the brain. Dimond and Beaumont (1974) reported that "each hemisphere is an information-processor which works through the information presented to it in a machine-like fashion, quite independently of the state of its partner. Only after the information has been processed do the functions at one side integrate with those of the other" (p. 81). There is evidence that the physiological mechanisms used by each hemisphere to process the sensory information also seem to coincide with the specialized cognitive modes of each hemisphere. The left hemisphere seems more anatomically specialized for the discrete, focal information=processing underlying logic, and the right hemisphere is more diffusely organized which is advantageous for orientation in space and for other situations that require simultaneous processing of many units at once (Semmes, 1968).

Auditory Information Processing

Grinder et al. (1977) and Cameron-Bandler (1978) have suggested that eye movements either left or right horizontally and down left involve auditory processing. Since eye movements are of major interest in this study, research on lateral eye movements will be discussed in a separate section. Other examples of relevant research will be discussed here.

It has been known for a long time that speech is dominant in the left hemisphere, primarily for right-handed individuals, but also for 56% of left-handed individuals (Levy, 1974). Verbal tasks are mediated by the left hemisphere while spatial tasks are mediated by the right hemisphere (Gardner, 1976). Milner (1962) studied patients with lesions to the right or left temporal lobes using the non-verbal Seashore Measures of Musical Talents. She found that people with lesions of the right temporal lobe made more errors than the group with left temporal lobe lesions on all parts of the musical test. She concluded that the right temporal lobe is greatly involved in understanding musical arrangements.

Dichotic listening tasks have been a technique used to study right or left ear superiority on tasks involving the presentation of different auditory materials to both ears simultaneously. Kimura (1967) reviewed some of her work using this technique with normal subjects and presented the work of some other experimenters as well. She reported that the right ear which is contralateral to the hemisphere specialized for processing language and verbal material is predominant in its perception of words. The left ear which is connected more strongly to the right temporal lobe is superior in perceiving and assimilating melodies and musical arrangements. She concluded that the right hemisphere of the brain seems specialized for perceiving and discriminating musical patterns and sounds while the left hemisphere seems specialized for processing speech and material of a verbal nature.

In a series of experiments using electro-shock therapy, Deglin (1976) reported similar findings. By placing electrodes to only one side of the head at a time, these researchers found activity in that part of the brain could be relaxed or "put to sleep" for a couple of hours. As a result of this discovery, they were able to study the functions of each of the hemispheres alone as well as compare these functions with the normal behavior of the same person once the effects of the shock treatment subsided. The 'left hemisphere person' (whose right hemisphere had been relaxed) improved their speaking ability and his or her hearing for words became even more acute. Memory for the meaning of words remained intact. However, this 'person' was unable to speak in other than a monotone, was unable to recognize familiar noises such as coughing, laughing, thunderstorms and ceased to recognize or be able to hum well-known melodies or musical arrangements. Failure to distinguish between intonations or discriminate between male and female voices occurred. The opposite occurred for the 'right hemisphere person' (whose left hemisphere had been relaxed). This individual preferred responding by mime or gestures rather than using words to express themselves. Ability to memorize a list of words was impaired. This 'person' was able to recognize familiar noises and musical patterns even more quickly than when both halves of the brain were working together. Intonations were intact in his or her own expressions and this 'person' was able to distinguish easily between male and female voices.

Other researchers have found similar results concerning auditory processing using different techniques (e.g., Gazzaniga, 1970).

Dimond (1977) concluded that "with damage to the left temporal lobe the patient may lose his capacity for disentangling the sounds of speech, whereas at the opposite hemisphere the patient may lose the capacity for disentangling the elements of a musical arrangement" (p. 65).

In summary, it appears that the left hemisphere of the brain specializing in language, speech and verbal materials is more adept at processing information of an auditory-verbal nature. The right hemisphere is specialized to process auditory information of a non-verbal, musical nature distinguishing between intonations and pitch easily.

Visual Information Processing

It has been suggested that eye movements up and to the right reflect a visual constructed image (Cameron-Bandler, 1978; Grinder, et al., 1977). This type of image formation relies on a sequential process which involves constructing or fitting pieces together one by one in order to construct an image or picture in the mind's eye. Eye movements up and to the left reflect an image of a past experience, one that is recalled from memory of something that has been seen before. The type of information processing underlying each of these visual images coincides with the research on hemispheric specialization.

Dimond and Beaumont (1974) reported that each cerebral hemisphere has a visual system of its own. Evidence from the work on split-brain patients indicated that each hemisphere possesses its

own complete inner visual world, one that is distinctly different from the visual world of the other hemisphere. In an earlier experiment, Sperry and his associates (1964) used split visual input to the hemispheres by flashing the word "heart" to the patient. The word, however, was split into "he" and "art" with "he" flashed only to the right hemisphere and "art" flashed only to the left hemisphere. Recall that input to the person's right visual field goes directly to the left hemisphere while input to the left visual field projects directly into the right hemisphere. When asked to report verbally what they saw, patients said "art" but when asked to point (respond non-verbally) to what they had seen, patients pointed to "he."

In another experiment, Levy, Trevarthen and Sperry (1972) showed photographs of people's faces that had been created by putting together the left half of a face from one person with the right half of a face from another person. The photographed faces were shown to split-brain patients so that only one-half of the face would be perceived by each hemisphere. When asked to choose verbally which face they had seen, patients chose the face projected to the left hemisphere. When asked to point, they chose the face projected to the right hemisphere. Other studies using the "split-stimulus" technique confirmed these results. Levy and Travarthen (1976) concluded from their series of "split-stimulus" experiments that the left hemisphere recalls visual stimuli through a sequential style of linguistic encoding thus making it more difficult to see and appreciate the entire image at once. The right hemisphere, however, is mediated by

a memory image of the whole visual stimuli, thus making it easier to recall.

Results from a Space Relations Test (Levy-Agresti & Sperry, 1968) with both split-brain and normal subjects indicated that each hemisphere used different strategies in performing the mental operations necessary to complete the task. The Space Relations Test was composed of matching a three-dimensional form with its unfolded two-dimensional representation. Performance using the right hemisphere was better on this task since a strategy which synthesized visual-spatial similarities in form was used. The left hemisphere analyzed each detail of the form one by one conceptualizing and using a process of linguistic naming to perform the task.

The research reported by Deglin (1976) using electro-shock therapy techniques revealed that the 'left hemisphere person' (whose right hemisphere remains inactive temporarily) prefers to use an abstract method for dealing with similar visual stimuli, and is unable to memorize odd-shaped, non-classifiable figures. Visual impressions do not seem to register. The 'right hemisphere person' (whose left hemisphere remains inactive temporarily) does the opposite. This 'person' groups stimuli together based on visual appearance rather than by abstract meaning. He or she is capable of memorizing odd-shaped figures for recall later but is unable to memorize a list of words. Visual impressions register and spatial orientation is intact.

In summarizing the results of tests involving the visual sensory modality, it appears that the left hemisphere of the brain which specializes in processing information abstractly and sequentially is predominant in constructing visual images. The right hemisphere is specialized in registering a whole visual stimulus all at once. It is predominant, then, for recalling past experiences and memory of an impression or 'eidetic' visual image.

Kinesthetic Information Processing

Grinder et al. (1977) and Cameron-Bandler (1978) proposed that eye movements down and to the right reflect kinesthetic processing of information or sensing how the body feels. Eye movements down and to the left reflect inner speech. Very little research relating directly to cerebral asymmetry has been carried out concerning the kinesthetic sensory modality as an encoding process separate from the visual-tactile combination reported by Gazzaniga (1970) used in spatial orientation. However, some studies on imagery referred to two components of inner speech. One of those components is strictly auditory and involves only the sounds of words in speech. The other component of inner speech involves the kinesthetic sensations of movement in the throat and larynx (Griffitts, 1927).

Galton (1907) defined kinesthesia as a muscular response involved in performing some type of action. His own experience was described as "where I am both spectator and all the actors at once, in an imaginary mental theatre. Thus, I feel a nascent sense of some muscular action while I simultaneously witness a puppet of my brain--

a part of myself--perform that action, and I assume a mental attitude appropriate to the occasion" (p. 142). Piaget (1959) believed kinesthetic representations derive from the 'sensorimotor' representations in childhood.

In an experiment involving imagery and free association to animal names, Aylwin (1977) found that associations to kinesthetic imagery involved a linear sequence of events organized in an "actor to action to object" framework. To experience the world in a kinesthetic way involved processing a sequence of body sensations or movements. It requires the same type of sequential construction for which the left hemisphere is specialized. Bogen (1969) described this 'subject to action to object' sequence as propositional thinking and based on his research assigned a left hemisphere superiority to this type of thinking.

It appears that the processes involved in the kinesthetic modality reflect left hemisphere predominance. A kinesthetic image involves a sequence of action or a series of steps to complete the action, the type of cognitive process for which the left hemisphere is specialized.

Summary of Sensory Modalities and Cognitive Modes

The studies discussed above on cerebral asymmetry reveal that the left hemisphere in the human brain for 99% of right-handed individuals (Levy, 1974) is specialized to perform cognitive operations of a linear, sequential nature while the right hemisphere is specialized for processing information in a simultaneous, holistic way. A

direct link can be made to the theory of representational systems postulated by Grinder et al. (1977).

These theorists defined two types of visual images: visual constructed and visual 'eidetic.' A visual constructed image is defined as creating a new picture that has never been seen before by putting together separate, distinct, countable parts to form a picture in the mind's eye. In constructing a visual image of this type, it can be seen that the underlying process involved is the speciality of the left hemisphere. A sequential, step-by-step order of information is used to form the picture. An example of a visual constructed image would be to picture a "purple cow." In order to do so requires two steps: imaging a cow, then coloring it purple; or imaging the color purple and forming an outline of a cow. A visual 'eidetic' image is defined as having a visual memory image of something that has been seen before. The type of information processing involved in having visual 'eidetic' images where a whole, visual impression is seen at once is the predominant mode of the right hemisphere; the ability to see the whole scene all at once reviewed again in the mind's eye.

Grinder et al. (1977) postulated three kinds of auditory representations. From the review of the literature, it seems that applicable labels would be: auditory-verbal, auditory-musical, and auditory-inner speech. An auditory-verbal representation involves hearing and making sense out of spoken words. To understand language requires a sequential type of process for which the left hemisphere is specialized. An auditory-musical representation involves hearing

sounds presented all at once as in a musical arrangement or in the familiar noises of living. To understand and make meaning from these sounds which requires the simultaneous processing of several different intonations, is the process employed by the right hemisphere. Auditory-inner speech (or internal dialogue) involves only the auditory sounds or intonations of speech. Rather than understanding the meaning of the words themselves, the meaning of the internal messages is conveyed through the intonations of the dialogue. Recognition of intonations has been shown to be specialized in the right hemisphere.

Finally, processing kinesthetic information, sensing how the body feels, seems to involve the predominant use of the left hemisphere which is specialized for processing the sequential nature of movement.

Theory of Sensory Modalities and Eye Movements

Grinder et al. (1977) and Cameron-Bandler (1978) suggested that the eye movements an individual makes reveal the kind of sensory information that is being processed at any moment in time. Reviewing their theory: (1) eye movements up and to the left reflect visual 'eidetic' images; (2) eye movements up and to the right reflect visual constructed images; (3) eyes defocused at midline reflect visual imaging which can be either constructed or 'eidetic'; (4) eye movements to the left or right on a horizontal plane reflect auditory images of musical patterns, familiar noises or verbal sounds; (5) eye movements down and to the left reflect auditory internal dialogue;

(6) eye movements down and to the right reflect kinesthetic images, sensing how the body feels.

Theory of Attention and Orienting Reflexes

It has been shown thus far that there are two major modes of cognition, one mode specialized for each of the two cerebral hemispheres in the human brain. It has also been shown that the visual, auditory and kinesthetic sensory modalities can be linked to the cognitive process required to form each of six types of sensory images: visual constructed, visual 'eidetic,' auditory verbal, auditory musical, auditory internal dialogue, and kinesthetic images. The question now is, how do the eye movement patterns suggested by Grinder et al. (1977) and Cameron-Bandler (1978) reflect these sensory images and thus reflect the underlying cognitive process?

Kinsbourne's (1972; 1973) research helps answer this question. He said that each hemisphere of the brain in effect controls the contralateral side of the body including eye movements. Each hemisphere of the human brain has a frontal lobe located at the front of the cortex at the forehead (Dimond, 1977). Each of these frontal lobes contains a mechanism for controlling the direction of attention. These symmetrical features direct a person's attention (turning of the head and eyes) to either the left or right in order to perceive stimuli at the left or right of the person. "When the effects of the two (frontal lobe) centers are equally balanced, attention (turning of the head and eyes) is directed straight ahead" (Kinsbourne, 1972, p. 539).

Consider now the asymmetrical features of the human brain. The left hemisphere is specialized for sequential processing which is the cognitive mode needed to understand verbal cues. The right hemisphere is specialized for simultaneous processing which is the cognitive mode needed to synthesize spatial relationships. These cognitive modes do not exist in both hemispheres symmetrically but rather predominate in one hemisphere or the other (Zangwill, 1962). The neurological pathways of each hemisphere connect more strongly to the contralateral side of the body (Kimura, 1967) and it is therefore important to present a stimulus requiring a specific type of processing to the side opposite the hemisphere which is specialized for that type of thinking. Because "the cerebrum is a highly-linked system . . . when subjects await a verbal stimulus and must also look centrally, the verbal activation overflows to the left-sided orientation center (the left hemisphere) driving attentional balance off center and to the right" (Kinsbourne, 1972, p. 539).

This same phenomenon has been demonstrated by Penfield and Roberts (1959) using electrical stimulation of the human brain. When one hemisphere was stimulated, the head and eyes turned in the opposite direction. For example, when the left hemisphere is stimulated, the eyes and head turn to the right. The opposite occurs when the right hemisphere is stimulated.

Kinsbourne's (1973) experiments demonstrated this attention shifting and turning of the head and eyes. He required normal subjects to locate a gap in a square while speaking. Subjects were less likely to detect a gap on the left side of the square because

by speaking, their attention and eyes had been shifted to the right side of the square. He concluded that if certain tasks involve one hemisphere primarily, a person's eyes will shift in the direction opposite of that hemisphere. Lateral eye movements left or right indicate that the opposite hemisphere of the brain is being activated at any given moment in time. Vertical eye movements and no eye movements indicate equal activation of the hemispheres.

Kinsbourne's (1972; 1973) theory of orienting reflexes can be applied to the eye movement patterns suggested by Grinder et al. (1977) and Cameron-Bandler (1978) to understand the meaning of the direction of eye movement. In creating or having visual images, a person's eyes move up and to the right or left. The vertical movement (up) implies that both hemispheres are being activated to process the visual information. The lateral movement, right or left, indicates that one or the other hemisphere is predominant for processing. The combination of eye movement up and to the right, for example, indicates that although both hemispheres are involved in processing the visual information, the left hemisphere predominates in the processing. The cognitive operation, therefore, is analytical, logical, and sequential. Eye movements up and to the left, for example, indicate activation in both hemispheres but predominantly involves the holistic thinking of the right hemisphere. The same meaning can be applied to the other eye movement patterns in the Grinder et al. (1977) theory.

Eye Movements as Indicators of Cerebral Activation

Although eye movement research has been of interest for a long time, it is only recently that research on eye movements has focused on using the lateral direction as an indicator of cerebral asymmetry or hemispheric activation. Teitelbaum (1954) first reported the phenomenon of eye movement either left or right during mental concentration. He observed that the direction of movement seemed characteristic for any given individual and thought that the gaze deviation was to allow the person to break contact with the environment, to reduce external stimulation and pave the way for internal, reflective thinking. Day (1964) also noticed lateral eye movements associated with reflective thinking and observed that the right or left direction was fairly consistent for each person. He reported on a number of physiological, personality and cognitive differences between people whose eye movement preference was to the left from those whose eye movements were mainly to the right (Day, 1964; 1967a; 1967b). These findings were confirmed by Duke (1968) who labelled people as "left movers" or "right movers."

Bakan (1969; 1971) hypothesized that the right or left movement is associated with activation in the hemisphere of the brain contralateral to the direction of eye movement. Specifically, when a person looks to the right immediately after a question requiring reflective thought has been asked, it is assumed that the contralateral left hemisphere of the brain is being activated to process the information requested. Similarly, when a person looks to the

left following a question that requires inner thought, it is assumed that the contralateral right hemisphere of the brain is being activated. Bakan (1969; 1971) thus proposed a model of brain asymmetry and individual preference for using one hemisphere of the brain to process information over the other hemisphere. The consistency of eye movements either left or right is interpreted as an indicator of preference or habitual use of certain kinds of information processing. That is, people who consistently shift their eyes right when pondering the answer to a reflective question prefer using the functions specialized in the left hemisphere (verbal, analytical) and people who consistently shift their eyes to the left prefer using the nonverbal, spatial relationship functions specialized in the right hemisphere. A more detailed description of cerebral asymmetry is discussed elsewhere in this review.

To further study the relationship of direction of lateral eye movement and brain asymmetry, researchers focused on developing reflective questions that were intended to tap the specialized functions of the hemispheres. There is evidence that the direction of lateral eye movements can be influenced by the content of the question used to elicit movement (Gur, Gur & Harris, 1975; Kocel et al., 1972; Kinsbourne, 1972; Weiten & Etaugh, 1974), though this finding was not confirmed by Ehrlichman et al. (1974). Methods employed by those with consistent results were similar to each other but different from those employed by Ehrlichman et al. (1974), who did not have an interviewer present. Those with consistent results reported that questions that required left hemisphere processing increased the probability of

right eye movements and questions requiring right hemisphere processing increased the probability of left eye movements. The cognitive demands of the questions influenced the direction of eye movement more than an individual's habitual use of one hemisphere as the preferred mode of thinking.

Although these results seem incompatible with Bakan's (1969; 1971) results of consistency, Gur (1975) noted that the seemingly conflicting results could be accounted for when the location of the examiner was tested. She found that when the examiner faced subjects (method of Day, 1964; Duke, 1968; Bakan, 1969, 1971; Bakan & Strayer, 1973), they were consistent in the direction of their lateral eye movements regardless of the cognitive demands of the question. She also found that when the examiner sat behind subjects (method of Kinsbourne, 1972; Kocel et al., 1972), the cognitive demands of the questions elicited the eye movements assumed to be associated with the type of information processing done in the contralateral hemisphere.

All of the studies discussed thus far have assumed that the direction of lateral eye movements indicates which hemisphere of the brain is being activated to process information during reflective thought. Lateral eye movements to the right are assumed to indicate verbal, analytic modes while lateral eye movements to the left are assumed to indicate the spatial relationship, holistic mode of thinking. Individuals may rely on a predominant mode of thinking in a face-to-face situation. They may also use whichever hemisphere of

the brain is specialized to meet the particular cognitive demands of the task in a less social, more impersonal situation.

The direction of eye movements emphasized in the literature is the lateral movement, either left or right on a horizontal level. However, vertical eye movements have also been observed (Bakan, 1969; Ehrlichman et al., 1974; Hiscock, 1977; Kinsbourne, 1972). Blank stares, recorded as no movement, have also been reported to occur (Ehrlichman et al., 1974). Kinsbourne (1972; 1973) suggested that vertical eye movements indicate that both hemispheres of the brain are being activated equally if the eyes move up and/or down at mid-line. If, however, subjects look up and left as they did in response to reflecting on spatial questions (Kinsbourne, 1972), the assumption is that although both hemispheres of the brain are being activated to process the information, the right hemisphere predominates in solving the task.

It is suggested from this review that both lateral (horizontal) and vertical eye movements do occur when subjects are asked questions that require mental concentration or reflective thought. The type of questions or statements designed by researchers have varied. Some have used interpretation of proverbs (Bakan & Strayer, 1973) while others have specified certain cognitive demands by asking verbal, numerical, spatial (Gur et al., 1975; Kinsbourne, 1972) and musical questions (Couch, 1976; Kocel et al., 1972; Weiten & Etaugh, 1974). Meskin and Singer (1974) found that questions requiring an extended search of memory such as "what is your earliest memory from your first day of kindergarten?" elicited greater movement than minimal

search questions such as "what is the color of your eyes?" Day (1964) and Duke (1968) also found that subjects did not always break eye contact with the examiner and reported that this was to be expected if the questions were too easy or caused embarrassment.

All of the questions or statements used in lateral eye movement research have required some degree of mental concentration, inner attention or reflective thinking. Most of the emphasis on the design of questions has been to tap the verbal and the non-verbal processes of the left and right hemispheres, respectively. Questions, therefore, have been classified as processing verbal, sequential information (proverbs, numerical) or non-verbal, simultaneous information (spatial, musical). None of the research on lateral eye movements has considered the effect of sensory modality on eye movements although some of the questions used have implied the sensory modalities of vision and audition.

Eye Movements and Representational Systems

Only one study has been reported that relates to the eye movement patterns suggested by Grinder et al. (1977) and Cameron-Bandler (1978). One other study was reported which focused on primary representational systems using frequency of predicate verbalizations to classify subjects. Although other research on this portion of the model for psychotherapy is currently in progress, no results have been reported nor were available for review here.

In an investigation of eye movements and representational systems, Owens (1977) was interested in exploring which methods

predicted representational systems. He tested combinations of three measures: self report, eye movement and verbalizations. A total of sixteen raters were used. Eight of these raters, in an interview situation, questioned subjects and rated eye movements only. Six of the nine questions asked required no verbalization from the subjects and were used for eye movement rating only. Three other questions which required verbalizations were asked. Sessions were audiotaped and listened to later by eight other raters not involved in the interviewing process. His results indicated that the combination of eye movements and verbalizations was significant in predicting representational systems. No other combinations were significant as predictors.

In another study, Shaw (1977) was interested in the effect on recall of subjects' primary representational systems. She classified individuals according to their primary representational system using verbalizations to do so. She then tested subjects on their ability to recall items presented in three forms of a story described with visual, auditory and kinesthetic predicates. Her results showed that subjects did not respond differentially to the visual, auditory and kinesthetic predicates in the stories.

Summary

This review of the literature has focused on research related to the visual, auditory and kinesthetic sensory systems. Topics discussed included the structures of the brain used for processing sensory information. It was noted that the two cerebral hemispheres

of the human brain each process sensory information but do so in two different ways. The right hemisphere processes information simultaneously. The left hemisphere processes information sequentially. These cognitive modes as well as orienting reflexes associated with direction of attention including head turning and eye movements were discussed. Studies on lateral eye movements as indicators of hemispheric activation were reviewed and discussed in relationship to the theory of eye movements and representational systems.

In Chapter IV, an overview of the design and procedures employed in this study are presented.

CHAPTER IV

RESEARCH DESIGN AND METHODOLOGY

Introduction

Based on the research on cerebral asymmetry and on imagery, it seemed reasonable to assume that the eye movement patterns postulated by Grinder et al. (1977) and Cameron-Bandler (1978) do reflect the underlying processes of the visual, auditory and kinesthetic sensory modalities. Rather than attempt to replicate Owens' (1977) findings that eye movements and verbalizations do predict representational systems, it seemed reasonable to go on to the next step and develop a study that related more directly to the interviewing situation of a therapy relationship.

Therefore, this study was an attempt to determine the effect of interviewers responding differentially to subjects' representational systems as indicated by eye movement. Generally, the research question was: Is there a difference in perceived ease of communication and perceived empathic understanding when interviewers responded to subjects' eye movements with perceptual predicates that were congruent as opposed to incongruent with the representational system indicated by eye movement?

In this chapter, the research design and methodology are presented. Included in this discussion are the following areas:

(a) selection and description of the sample; (b) selection, training and reliability of interviewers; (c) determination of the stimulus cues; (d) research procedures; (e) instrumentation; (f) research design; (g) research hypotheses; and (h) analysis.

Selection of Sample Population

Subjects were drawn from the undergraduate student population at Michigan State University. During the second and third weeks of October 1979, staff members from five residence hall areas were contacted to solicit volunteers for the study. In addition, one instructor in the College of Education agreed to solicit volunteers from his class (ED 450) and students from the Psychology Department subject pool were contacted to solicit their participation. A letter from the researcher with a sign-up list attached was given to each staff member and/or instructor who agreed to solicit subjects (Appendix A). Those students who voluntarily agreed to participate in the study were given the information on the cover letter and asked to sign their name, address, phone number and sex on the attached sign-up sheet. In order to participate, it was necessary for subjects to meet the following criteria: (a) persons who were right-handed; and (b) persons who had not suffered severe head injuries and lost consciousness for a long period of time.

A total of ninety-eight (98) students voluntarily signed up to participate in the study. Twenty-two (22) of these students were from the Psychology Department subject pool and therefore received credit which served as part of the total points for meeting course

requirements. Seventy-six (76) students did not receive any course credit for participating. Since other research options existed for those who received credit, the subject pool was not considered biased toward this particular project. The fact that some subjects received credit for participating and others received no credit was not deemed to be a variable that would in any way bias the results.

Before signing up to participate, individuals were told this was a doctoral research project in Counseling Psychology. They were told that if they signed up, they would be expected to participate in an interview which consisted of recalling and relating to an interviewer some past experiences in their life. At the end of the interview, they were to complete three short questionnaires. Both the interview and the completion of the questionnaires would take approximately thirty (30) minutes of their time. Individuals were made aware of the dates and times that the interviews would take place and were asked to indicate any strong preferences for a particular day or block of time on the sign-up sheet. Before agreeing to participate, students were also informed that all of their responses during the interview and on the questionnaires would be coded anonymously and kept confidential. In return for their participation, the researcher would be happy to share the results of the study once data analysis had been completed.

Sign-up sheets were collected from the staff members of the residence halls and from instructors. Students who had agreed to participate were told to expect a phone call and/or notice in their mailbox with an assigned time for them to take part in this study.

Description of Sample

A total of ninety-eight (98) subjects volunteered to participate in the study. Eighty-three (83) individuals actually participated. The fifteen (15) who did not participate either failed to arrive for their scheduled appointment or notified the researcher they were no longer interested. As a result, these fifteen (15) individuals were dropped from the research.

All subjects except one (who was a first year graduate student) were undergraduate students at Michigan State University in various academic majors. Ages ranged from 17 to 27 years with the majority of individuals between 18 to 22 years. The sample consisted of forty (40) women and forty-three (43) men. Both male and female students were included in this research since the literature reviewed on lateral eye movements regarding gender and cerebral lateralization did not suggest strong differences between males and females.

The sample was also limited by the following two criteria: (a) persons who were right-handed; and (b) persons who had not suffered severe head injuries where consciousness was lost for a long period of time. Of the eighty-three (83) subjects who actually participated, five (5) individuals did not meet these criteria and were subsequently dropped from the research. Finally, for statistical purposes, six (6) more subjects were randomly dropped from the research in order to balance the cells of the research design. The usable subject pool for data purposes thus included a total of

seventy-two (72) individuals--thirty-six (36) females and thirty-six (36) males.

Selection and Description of Interviewers

Four doctoral students from the graduate program in Counseling Psychology at Michigan State University were chosen as interviewers for this study based on their interest and availability. Two (2) males and two (2) females were selected. Three of the interviewers were in their fourth year of the doctoral program and currently doing an internship at the Michigan State University Counseling Center. One of the interviewers was a first year doctoral student. All but one of the interviewers had no prior knowledge of the Bandler and Grinder (1975, 1976, 1977) model of representational systems and eye movement patterns.

Training of Interviewers

A two hour training session was held for interviewers one week prior to the beginning of data collection. The training session and expectations of interviewers was announced via a letter to interviewers. A copy of this letter is included as Appendix B. Prior to training, interviewers were also given a training manual to read in order to familiarize them with the Bandler and Grinder (1975) model of representational systems and the Grinder et al. (1977) theory of eye movements and verbalizations. This training manual is included as Appendix C.

All four interviewers, the researcher and two assistants (one male and one female) were present during interviewer training.

Following brief introductions and a short review of the model of representational systems, eye movement patterns and perceptual predicates, the researcher/trainer demonstrated with one of the assistants (female) who served as a subject, the task required of interviewers. Specifically, the researcher/trainer simulated a "congruent" interview using the six stimulus statements designed to elicit eye movement. Interviewers were asked to observe this demonstration and record the subject's eye movement for each stimulus statement and identify the representational system used by the researcher/trainer in her verbal responses to the subject's eye movement. Following this demonstration, recorded observations were compared and questions answered.

The researcher/trainer then reviewed the theory of representational systems as indicated by eye movement patterns and described the procedure to be used for identifying and recording lead systems and representational systems. It was noted that some individuals make only one movement with their eyes when asked to recall some past experience. This movement indicates the representational system used by the individual to consciously store and recall experiences. Some individuals, however, make two movements with their eyes when asked to recall past experiences. When two movements occur, the first movement indicates the lead system which is unconscious, while the second movement indicates the conscious representational system. The task of the interviewers was defined as responding with perceptual predicates that were either congruent or incongruent with the subject's representational system--the system which is conscious

to the individual. Therefore, interviewers needed to be able to distinguish between representational systems and lead systems when two eye movements occurred and identify accurately the representational system when only one eye movement occurred.

To accomplish this end, a videotape which had been made prior to the training session was used. This videotape included six vignettes of three different people whose faces were videotaped. Each vignette was composed of a subject who displayed eye movements according to instruction and/or in response to stimulus statements designed to elicit recall of past experiences. Eye movement patterns displayed on the videotape are included as Appendix D. The first vignette in which the subject displayed nine separate eye movements was used for demonstration purposes only. Interviewers were asked to identify aloud the direction of eye movement and the representational system indicated. Discussion followed the videotape demonstration and any questions were answered. The remaining five vignettes were then played and used to determine the accuracy of identifying eye movements and the agreement among interviewers in doing so. Interviewers recorded their independent observations (ratings) on a prepared form which is included as Appendix E. A test of accuracy of interviewers' ratings was made upon completion of the two hour training session and is discussed at the end of this section on training.

Following the videotaped demonstrations, interviewers were asked to observe the researcher/trainer simulating an "incongruent" interview with the male assistant serving as the demonstration

subject. Interviewers independently recorded their observations of the subject's eye movement(s) for each stimulus cue and identified the representational system used by the researcher/trainer in her verbal responses to the subject. For recording their observations, interviewers used the same rating form that had been prepared for use during the experiment itself. This rating form is included as Appendix F.

A discussion of perceptual predicates followed and the interview response conditions were discussed. During the experiment, all interviewers were to follow the same format which included first an introductory statement that described the sequence of what was to happen during the interview. Next, interviewers were to state the stimulus cue and observe and record the subject's eye movement(s). Third, interviewers were to ask subjects to describe the experience they were recalling. Fourth, interviewers were to verbally convey their understanding of the subject's experience. After all stimulus cues had been given, interviewers were to then thank subjects for their participation and instruct them to return to the experimenter where they would be asked to complete some questionnaires. The structure of the interviews with the six stimulus cues is included on the rating form interviewers used to record subjects' eye movements (Appendix F).

Within this format, interviewers in the "congruent" condition were to respond to the subject's eye movement(s) with perceptual predicates that matched the subject's representational system. Interviewers in the "incongruent" condition were to respond to the

subject's eye movement(s) with perceptual predicates that mismatched the subject's representational system. If two eye movements occurred for any stimulus cue in either condition, interviewers were to verbally respond "congruently" or "incongruently" (depending on condition) to the subject's representational system indicated by the second eye movement and not respond verbally to the lead system indicated by the first eye movement. This meant that interviewers in the "congruent" condition matched representational systems directly with visual, auditory or kinesthetic predicates when asking for the subject's description and conveying their understanding of the subject's experiences. Interviewers in the "incongruent" condition, however, were to respond with perceptual predicates that did not match either the subject's lead system or representational system. Thus, for subjects in the "incongruent" condition who made two eye movements, for example, up left, then down right = visual, then kinesthetic, interviewers were to respond with only auditory predicates. Guidelines for the response conditions are included as Appendix G.

Next in the training session, interviewers paired off and worked with the two assistants who served as subjects. Using the same stimulus cues which were to be used during the experiment, each interviewer practiced simulating a "congruent" interview in which the interviewer responded with perceptual predicates that matched the identified representational system as indicated by the subject's eye movement. Each interviewer also simulated an "incongruent" interview in which the interviewer responded with perceptual

predicates that mismatched the subject's eye movement for each stimulus cue. The other interviewer in each pair observed during this practice simulation. At the end of each practice interview, both the subject and the observer gave feedback to the interviewer on how he or she conducted the interview and delivered his or her verbal responses. Upon completion of this phase of the training session, interviewers decided which condition (congruent or incongruent) they chose to do during the experiment. This decision was based on their comfort and facility in using one condition or the other with the restriction that a male and a female interviewer were needed for each condition. The training session concluded with an announcement of the dates, times and place where the experiment would be held.

After the training session, a test of agreement was made to determine to what degree interviewers had identified eye movements correctly and consistently. In order to insure consistency among interviewers, it was necessary for them to score similarly and it had previously been decided to replace any interviewer who was grossly in error. All interviewers demonstrated 82% to 88% accuracy in identifying eye movements from the videotape. This was deemed quite satisfactory. A test of agreement among interviewers was also made to determine the accuracy of identifying representational systems from perceptual predicates used during the demonstration of the "incongruent" interview. All interviewers demonstrated 84% to 100% accuracy in identifying the representational system from perceptual predicates. This was also deemed quite satisfactory

particularly since the two interviewers who scored equally at 84% and the other two who scored equally at 100% accuracy were balanced across the two response conditions. Thus, all interviewers were retained for the study.

Determination of Stimulus Cues

The six stimulus cues employed in this study were designed to elicit recall of past experiences and thus elicit eye movements. All items were stated with non-specified predicates so that no predetermined direction of eye movement would occur thus leaving subjects the freedom to recall their past experiences in any of the three representational systems. The decision to employ non-specified predicates was designed for the purpose of identifying the use of a primary representational system should it occur in subjects. To insure that the stimulus cues contained only non-specified predicates, the items chosen were shown to three individuals familiar with Bandler and Grinder's theory. None of the items were found to presuppose a particular representational system.

Six stimulus cues were used. This number was based on a recommendation by Owens (1977) who had used nine cues in his study. He recommended the use of fewer items thus giving subjects more time to discuss their experiences. The content of the items was designed to require an extended search of memory which was reported by Meskin and Singer (1974) to elicit greater eye movement than minimal search questions. Three of the items were designed to reflect what a therapist might ask a client to think about. It was anticipated

that these items might raise some anxiety in subjects. The other three items were designed then to be non-threatening and possibly pleasant to think about. To insure that the stimulus cues did in fact elicit eye movements and recall of past experiences that could be described, a pre-test with eight individuals (four males, four females) was conducted. All items were found to elicit responses as expected.

Research Procedures

Subjects who participated in this study were initially contacted through residence hall staff or in classes. Once students agreed to participate and had indicated any strong preferences for a particular day or block of time, they were randomly assigned to one of two interview conditions. The two conditions consisted of: (a) a "congruent" condition where the interviewer responded verbally with predicates that matched the subject's eye movement; and (b) an "incongruent" condition where the interviewer responded with predicates that mismatched the subject's eye movement. Since it was necessary for design purposes to evenly distribute males and females among the four interviewers and over the two interview conditions, subjects were divided according to sex and then randomly assigned to interviewers.

Each subject was then contacted by phone by the researcher two or three days prior to the beginning of data collection with a designated day and time to appear for an interview. A written

notice (Appendix H) was also sent to each participant the day before they were to report for their interview.

Where possible, four subjects were scheduled to arrive every fifteen minutes. Upon arrival, they were asked by the researcher or an assistant to sign a consent form (Appendix I) and complete a brief information form (Appendix J). At this time, subjects were reminded of the confidentiality aspects and asked if participation was still desired.

Subjects were then escorted to separate rooms where they were introduced to their respective interviewer. The four rooms where interviews took place were classrooms located in one of the residence halls on campus. A table and two chairs were situated at the front of each classroom as uniformly across interview rooms as possible. The interviewer had been instructed to ask the subject to sit in the chair with his or her back to the door in order to eliminate visual distractions as much as possible. The two chairs were facing each other with the table alongside in order to simulate the atmosphere of a counseling interview. All interviewers had been provided with a clip board, a list of times to expect subjects with each subject's first name and code number entered next to their assigned time, and an exact number of rating forms (Appendix F) needed for the day. Interviewers' rating forms had been coded with subject numbers prior to the beginning of the experiment.

Interviewers then gave the instructions to subjects for what was to happen during the interview and the interview process began. Following the last stimulus cue, interviewers then instructed

subjects to return to the reception area where they were to complete three short questionnaires. When subjects returned to the researcher or assistant, they were given the three paper-and-pencil self-reporting instruments. A description of these instruments is included in the Instrumentation section of this chapter. These forms as well had been coded with the same subject number prior to the beginnning of data collection. Upon completion of these forms, subjects were thanked for their participation and any questions were answered regarding feedback on the results of the study. The entire process for one subject entailed approximately thirty (30) minutes.

All subjects were processed within a period of two weeks. Originally, it was hoped that subjects would be processed within one week but this was impossible since one of the interviewers was unable to attend during the last originally scheduled evening of interviews. One other evening (November 1) was set up to complete those interviews.

Of the original ninety-eight (98) students who agreed to participate, eighty-three (83) actually appeared for their interview resulting in an 85% show rate. Three students when initially called to schedule a time for an interview indicated to the researcher they were no longer interested in participating and were therefore dropped from the research. Of the remaining ninety-five students, sixteen subjects failed to arrive at their scheduled time. All but seven of these subjects (who could not be reached and were dropped at this point from the research) were contacted by the researcher to reschedule another appointment time. Of the nine who were contacted

for rescheduling, six were rescheduled. The other three individuals indicated at this time they were no longer interested and were thus dropped from the research. Two of the rescheduled subjects failed to arrive for their rescheduled appointment and were also dropped. No subject was contacted more than once for rescheduling if they failed to appear. A total of fifteen (15) students were thus dropped from the research for failing to show up or indicating they were no longer interested.

As discussed in the Description of Sample section, five subjects who did appear for their interview were eliminated from the research because they failed to meet the following two criteria: (a) persons who were right-handed; and (b) persons who had not suffered severe head injuries. These criteria had been established prior to the experiment based on the Grinder et al. (1977) theory that eye movement patterns do not apply to left-handed individuals and based on the review of the literature regarding neurological functioning (e.g., Kinsbourne, 1972, 1974; Gardner, 1976).

Finally, for statistical purposes, six (6) more subjects were randomly dropped from the research in order to balance the cells of the research design. This resulted in a usable subject pool of seventy-two (72) individuals--thirty-six (36) males and thirty-six (36) females.

Subjects who participated in this research project were sent a follow-up letter (Appendix M) thanking them for their participation and describing the research project. Those who expressed further

interest in knowing more about the theory and the actual results of the research met with the researcher for discussion.

Instrumentation

Three instruments were chosen to measure the dependent variables of empathic understanding, ease of communication, anxiety and hostility in this study. The first instrument was the Relationship Inventory by Barrett-Lennard (1962). Although this inventory includes items to measure level of regard, congruence, unconditionality, willingness to be known, and empathic understanding, only those items that measure empathic understanding were used. A copy of this instrument is listed as Appendix K.

Internal consistency of each of the five scales was assessed by the split-half method using the Spearman-Brown formula (Barrett-Lennard, 1962, p. 11). The reliability coefficient for the empathic understanding scale from data gathered after five therapy interviews with college students (n = 42) was .86. Test-retest reliability was also determined on each of the scales using a sample of college students (n = 36) from an introductory psychology class. The test-retest correlation for the empathic understanding scale was .89 (Barrett-Lennard, 1962, p. 12). Both these coefficients were within an acceptable range for the purposes of this study.

The second instrument used in this study was designed to measure the ease of communication experienced by the subject during the respective interview. No existing reliable or valid instrument was found in the literature to test ease of communication. Therefore,

an instrument designed to measure the effects of interview conditions on perceived ease of communication was developed by the author. A copy of this instrument is included as Appendix L. This is a 12-item self-report instrument with visual, auditory, kinesthetic and unspecified predicates distributed equally among items. This was done to eliminate bias toward any particular representational system in the wording of the items.

The third instrument chosen was the Multiple Affect Adjective Check List--Today Form (MAACL) by Zuckerman and Lubin (1965). This instrument is an extension of the Affect Adjective Check List--Today Form (AACL) which was designed to measure anxiety. Internal reliability on the AACL--Today Form was found to be .85 for anxiety when tested with college students (n = 35). The Multiple Affect Adjective Check List--Today Form (MAACL) includes the original adjectives designed to measure anxiety states as well as adjectives designed to measure the states of hostility and depression. Only two of the scales, anxiety and hostility, were used for analysis in the present study although data on the depression scale was collected. Internal reliability coefficients for anxiety and hostility on the MAACL--Today Form were .79 and .90 respectively when tested with (n = 46) college students (Zuckerman & Lubin, 1965, p. 17). Since the Today Form was designed to measure subjects' feelings at the moment, and most people fluctuate in mood from day-to-day, it was predicted that a test designed to measure affect from day-to-day would not be statistically reliable over time if it was truly sensitive to individual fluctuations. This was found to be the case when

reliability was tested over a seven day interval with college students (n = 46). Reliability coefficients for anxiety and hostility were found to be .21 and .15, respectively, over a seven day interval (Zuckerman & Lubin, 1965, p. 17). The internal reliability and test-retest reliability for the states of anxiety and hostility on the Multiple Affect Adjective Check List--Today Form indicated that this instrument appeared to be adequate for measuring the states of anxiety and hostility in the college students who participated in this research study.

Research Design

The design used in this study is a factorial design with three factors. Basically, a factorial design is defined as having two or more variables in the same experiment which can be manipulated or not manipulated by the experimenter (Glass & Stanley, 1970). Not only is it possible to test the main effects of each of the variables but it is also possible to test the interaction effects between the variables.

Each of the factors in this experiment is fixed. That is, the levels of each variable are selected arbitrarily or the entire population of levels of the variable is included (McSweeney, 1975, p. 70). Each of the factors in this study has two or more levels or categories. The design variables and dependent variables are listed in Table 4.1.

Table 4.1

Description of Independent and Dependent Variables

Variable	Number of Levels	Description of Levels
Independent:		
Sex of Interviewer	2	Female Male
Sex of Subject	2	Female Male
Condition	2	Congruent Incongruent (These levels stem from the Bandler & Grinder theory of representational systems)
Dependent:		
Measures	4	Empathic Understanding Ease of Communication Anxiety Hostility

The "levels" of each factor are crossed with those of the other factors. In this particular study, there are two female interviewers and two male interviewers who are completely crossed with the two conditions (congruent and incongruent). That is, all levels of sex of interviewer appear with all levels of condition. One female and one male interviewer were assigned to the congruent condition; one female and one male interviewer were assigned to the incongruent condition. Sex of subject is also crossed completely

with the two levels of interviewer sex and the two levels of condition. That is, female subjects were assigned randomly to both male and female interviewers and to both congruent and incongruent conditions; male subjects were also assigned randomly across interviewers and across conditions. Subjects are said to be nested within all levels of these three factors and crossed with the four levels of dependent measures.

The design for this study is illustrated in Figure 4.1. The design for this study also has the property of being balanced (i.e., equal subjects or observations per cell). This permits "testing more than one hypothesis about main effects efficiently in the same experiment. It also makes it possible to study how the factors interact" (Glass & Stanley, 1970, p. 490).

As can be seen from the diagram, the symbols I_1 and I_2 represent the female and male interviewers, respectively. The symbols C_1 and C_2 represent the two experimental conditions. C_1 signifies the congruent condition and C_2 signifies the incongruent condition. The symbol M represents the measure of perceived relationship between interviewer and subject. For this study: M_1 signifies the measure of empathic understanding, M_2 signifies the measure of ease of communication, M_3 signifies the measure of anxiety, and M_4 signifies the measure of hostility.

Also in the diagram, it can be seen that S_1 and S_2 represent female and male subjects, respectively. Thus far, it can be said that both levels of sex of interviewer, condition and sex of subject are crossed with each other producing eight factor-level combinations.

				Empathy M_1	Ease M_2	Anxiety M_3	Hostility M_4
Female Interviewers I_1	Congruent C_1	Female Ss S_1	R_1 : R_9				
		Male Ss S_2	R_1^I : R_9^I				
	Incongruent C_2	Female Ss S_1	R_1^{II} : R_9^{II}				
		Male Ss S_2	R_1^{III} : R_9^{III}				
Male Interviewers I_2	Congruent C_1	Female Ss S_1	R_1^{IV} : R_9^{IV}				
		Male Ss S_2	R_1^V : R_9^V				
	Incongruent C_2	Female Ss S_1	R_1^{VI} : R_9^{VI}				
		Male Ss S_2	R_1^{VII} : R_9^{VII}				

Figure 4.1. Research Design

Nested within each of these factor-level combinations are specific subjects (replications) designated by the symbols R, R^{I}, R^{II}, etc. These symbols (R, R^{I}, R^{II}, etc.) are subscripted by numbers from one to nine indicating each of the nine subjects in each of the cells. Hence, R_5^{III} designates the fifth subject out of the male subjects in the incongruent condition with a female interviewer. All subjects, regardless of condition, took the same measures of relationship (M_1, M_2, M_3, M_4). Because there is a multiplicity of dependent variables in this study, special consideration must be given to the analysis of the data obtained from the measures through the design. A multivariate analysis of variance procedure was used to test for differences between groups and interactions.

The logic for this design is predicated on the following notions. It is assumed that all subjects exhibit to some degree the eye movement representational scheme to internally map and access their recall processes. The critical underlying variable necessary to this study then is present. Hence, one can expect some unknown but in principle definable distribution on this construct. One can thus use the reasoning endemic to randomization to maintain this distribution when the subject pool is assigned to their respective groups. It is assumed that the necessary requisite skills needed for adequate scaling of perceptions relative to empathy, ease, anxiety and hostility are also present in all subjects and are distributed equivalently between conditions due to randomization. In a factorial design, "bias is avoided by the random assignment of the experimental units to the factor-level combinations" (Glass &

Stanley, 1970, p. 490). The assignment paradigm can thus be considered as illustrated in Figure 4.2.

Research Hypotheses

The hypotheses which guide this study are derived from the purpose of the study. Because the design used is a multifactorial design, there is a necessary ordering of the hypotheses that can be tested from this design. This ordering rests primarily on the logic of hypothesis testing rather than on the statistical algorithms used because the design is balanced (i.e., equal number of observations per cell).

In this section, the major hypotheses are presented, using the following abbreviations when the hypotheses are translated into statistical notation.

H_o = Null Hypothesis

H_a = Alternate or Research Hypothesis

M = Vector of mean scores for all subjects in a given category on the dependent variables

m = Mean score for all subjects in a given category on a particular dependent variable

COND = Conditions

C_1 = Congruent Condition

C_2 = Incongruent Condition

EMP = Empathic Understanding Scale (Barrett-Lennard)

EASE = Ease of Communication Scale

ANX = Anxiety Scale (MAACL)

HOST = Hostility Scale (MAACL)

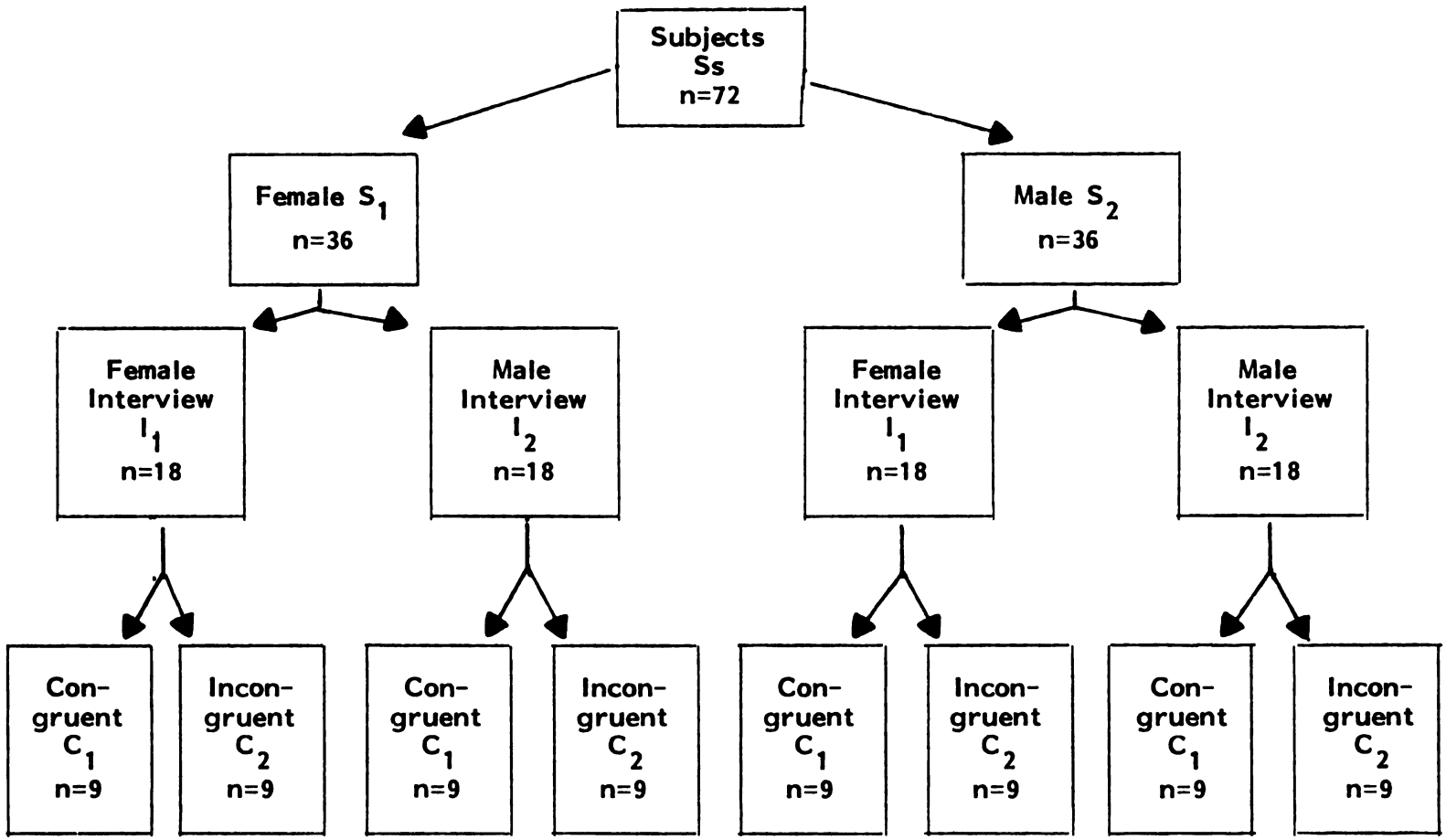


Figure 4.2. Random Assignment Paradigm

IS = Sex of Interviewer

SS = Sex of Subject

I_1 = Female Interviewers

I_2 = Male Interviewers

S_1 = Female Subjects

S_2 = Male Subjects

$I:C_1$ = Interviewers in Congruent Condition

$I:C_2$ = Interviewers in Incongruent Condition

In order to maintain consistency in the presentation of the hypotheses when results are analyzed and presented in Chapter V, the order of presentation of the hypotheses is as follows: (a) second order interaction (3-way interaction); (b) first order interactions (2-way interactions); and (c) main effects.

Second Order Interaction

Null Hypothesis I:

There will be no significant sex of interviewer by sex of subject by conditions interaction as indicated by the subjects' mean scores on the four dependent variables of empathy, ease, anxiety and hostility.

$$H_o: \ M_{IS} \times M_{SS} \times M_{COND} = 0$$

$$H_a: \ M_{IS} \times M_{SS} \times M_{COND} \neq 0$$

First Order Interactions

Null Hypothesis II:

There will be no significant sex of subject by conditions interaction as indicated by the subjects' mean scores on the four dependent variables of empathy, ease, anxiety and hostility.

H_o: $M_{SS} \times M_{COND} = 0$

H_a: $M_{SS} \times M_{COND} \neq 0$

Null Hypothesis III:

There will be no significant sex of interviewer by conditions interaction as indicated by the subjects' mean scores on the four dependent variables of empathy, ease, anxiety and hostility.

H_o: $M_{IS} \times M_{COND} = 0$

H_a: $M_{IS} \times M_{COND} \neq 0$

Null Hypothesis IV:

There will be no significant sex of interviewer by sex of subject interaction as indicated by the subjects' mean scores on the four dependent variables of empathy, ease, anxiety and hostility.

H_o: $M_{IS} \times M_{SS} = 0$

H_a: $M_{IS} \times M_{SS} \neq 0$

Main Effects

Null Hypothesis V:

There will be no significant difference between female subjects and male subjects as indicated by the subjects' mean scores on the four dependent variables of empathy, ease, anxiety and hostility.

$$H_o: \ M_{S_1} = M_{S_2}$$

$$H_a: \ M_{S_1} \neq M_{S_2}$$

Null Hypothesis VI:

There will be no significant difference between interviewers in the congruent condition and interviewers in the incongruent condition as indicated by subjects' mean scores on the four dependent variables of empathy, ease, anxiety and hostility.

$$H_o: \ M_{I:C_1} = M_{I:C_2}$$

$$H_a: \ M_{I:C_1} \neq M_{I:C_2}$$

Null Hypothesis VII:

There will be no significant difference between female interviewers and male interviewers as indicated by the subjects' mean scores on the four dependent variables of empathy, ease, anxiety and hostility.

$$H_o: \ M_{I_1} = M_{I_2}$$

$$H_a: \ M_{I_1} \neq M_{I_2}$$

The main effects for this study were developed to test the notion that if individuals in a simulated counseling interview were responded to by interviewer-therapists with perceptual predicates

congruent to their representational system(s), those individuals would report being understood and at ease in their communication with the interviewer. It logically follows that they would also report less anxiety and less hostility. Conversely, individuals who were responded to by interviewer-therapists with perceptual predicates incongruent to their representational system(s) would report being misunderstood and ill at ease in their communication with the interviewer. They would also report more feelings of anxiety and more hostility. Consequently, if the main effects are significant in a statistical sense, then further investigation will be done to determine if:

1. Subjects in the congruent condition will report significantly higher scores on perceived empathic understanding than subjects in the incongruent condition.

$$m_{C_1\ EMP} > m_{C_2\ EMP}$$

2. Subjects in the congruent condition will report significantly higher scores on perceived ease of communication than subjects in the incongruent condition.

$$m_{C_1\ EASE} > m_{C_2\ EASE}$$

3. Subjects in the congruent condition will report significantly lower scores on anxiety than subjects in the incongruent condition as measured by items on the Multiple Affect Adjective Check List--Today Form.

$$m_{C_1\ ANX} < m_{C_2\ ANX}$$

4. Subjects in the congruent condition will report significantly lower scores on hostility than subjects in the incongruent condition as measured by items on the Multiple Affect Adjective Check List--Today Form.

$$m_{C_1\ HOST} < m_{C_2\ HOST}$$

Analysis

Multivariate Analysis of Variance (MANOVA) was used to analyze the results of the data. This type of analysis was chosen because it allows the researcher to consider several dependent variables at once which are believed to be highly interrelated. The purpose of the analysis was to determine the overall effect of the two interview conditions on subjects' perceptions of empathic understanding, ease of communication, anxiety and hostility simultaneously.

With Multivariate Analysis of Variance, it is necessary to insure that the following assumptions are met: "(a) dependent variables be normally distributed; (b) observations be independent across subjects; and (c) variances of dependent variables be similar across groups" (VanEgeren, 1973, p. 522). To insure the statistic would be robust to possible violation of these assumptions, an equal number of subjects was randomly assigned to each cell. Comparisons within the MANOVA model were considered at the $p < .10$ level of significance. If the multivariate test resulted in significant differences between groups at the .10 level, univariate tests were conducted to determine on which dependent measures groups differed. The significance level for each of the four univariate tests was set at $p < .025$ (.10 divided by the number of dependent variables, 4).

Summary

Seventy-two undergraduate students at Michigan State University were considered the usable subject pool who voluntarily participated in this research project. These subjects, 36 men and 36 women, were randomly assigned to two treatment conditions. The treatment conditions consisted of: (a) a congruent interview in which interviewers responded with perceptual predicates that matched the subjects' representational system as indicated by eye movement; and (b) an incongruent interview in which interviewers responded with perceptual predicates that mismatched subjects' representational systems as indicated by eye movement. All interviews were structured identically in format and content with only predicates varied according to condition.

Prior to the experiment, four interviewers, two male and two female doctoral students in Counseling Psychology, had been given an overview of the model of representational systems developed by Bandler and Grinder (1975, 1976). Specifically, interviewers were trained to accurately identify eye movement patterns as indicators of representational systems (Grinder et al., 1977; Cameron-Bandler, 1978) and respond with perceptual predicates that matched or mismatched the representational system indicated. One male interviewer and one female interviewer were assigned to each of the two treatment conditions.

When subjects arrived for the experiment, they were introduced to their respective interviewer and the interview began. Stimulus cues used during the interviews were designed to elicit recall of

past experiences and thus elicit eye movement in subjects. For each stimulus cue, interviewers responded to the subjects' eye movement with perceptual predicates that either matched or mismatched the eye movement depending on the treatment condition. At the end of the interview, subjects completed three self-report instruments: (a) the Barrett-Lennard Relationship Inventory (empathic understanding items only); (b) an ease of communication inventory designed by the author; and (c) the Multiple Affect Adjective Check List--Today Form.

Since the dependent measures were believed to be highly interrelated, multivariate analysis of variance was used to analyze the data. Comparisons within the MANOVA model were tested at the $p < .10$ level of significance. If the multivariate test resulted in significance, univariate tests were then conducted and tested at the $p < .025$ level of significance to determine on which dependent variables groups differed. The results of data analysis are presented in Chapter V.

CHAPTER V

ANALYSIS OF THE DATA

The purpose of this chapter is to present the data collected from the subjects who voluntarily participated in this research project. The results of data analysis are presented in accordance with Chapters I through IV and in accordance with the research design employed in this study.

Descriptive Statistics

Data on the four dependent variables of empathic understanding, ease of communication, anxiety and hostility were obtained from three self-report instruments which subjects completed immediately following their respective interviews. These data were used to determine the interactions and main effects of the three factors (independent variables) in this research design: sex of interviewer, sex of subject, and condition.

Table 5.1 contains the cell means and standard deviations for each of the factor-level combinations on each of the four dependent variables. The marginal means and standard deviations for each of the dependent variables are included at the bottom of the respective column.

The Pearson product-moment correlation coefficients between the various dependent variables is shown in Table 5.2. Inspection of

Table 5.1

Cell Means and Standard Deviations

			Empathy $\bar{x}$ S.D.	Ease $\bar{x}$ S.D.	Anxiety $\bar{x}$ S.D.	Hostility $\bar{x}$ S.D.
Female Interviewers	Congruent	Female Ss	27.33 9.60	26.22 6.16	5.33 4.00	5.78 3.46
		Male Ss	21.44 8.37	22.78 5.59	4.67 4.61	5.33 3.46
	Incongruent	Female Ss	25.44 6.58	26.33 5.48	6.11 4.40	7.00 4.50
		Male Ss	13.22 11.05	10.56 12.51	5.67 3.24	7.22 3.53
Male Interviewers	Congruent	Female Ss	16.22 12.23	19.33 10.30	5.22 3.83	5.89 4.20
		Male Ss	16.22 10.57	26.11 5.97	4.11 3.33	4.22 2.68
	Incongruent	Female Ss	18.11 12.28	21.89 7.61	6.78 3.93	6.11 3.02
		Male Ss	14.78 8.36	22.00 5.57	7.11 4.68	6.22 4.35
			19.10 10.71	21.90 8.90	5.63 3.95	5.97 3.62

Table 5.2

Pearson Correlation Coefficients Between All Pairwise Combinations of the Variables Empathy, Ease, Anxiety and Hostility

	Empathy	Ease	Anxiety
Ease	.62*		
Anxiety	-.17+	-.31*	
Hostility	-.13	-.27*	.78*

*p < .05

+p < .10

these coefficients indicates, not surprisingly, that empathic understanding and ease of communication tend to be highly related ($r = .62$). Anxiety and hostility are also highly related ($r = .78$). It can also be seen that ease and anxiety are inversely related ($r = -.31$) as are ease and hostility ($r = -.27$). All of these relationships are statistically significant at the $p < .05$ level. It is noted that empathy and anxiety are also inversely related ($r = -.17$) at the $p < .10$ level of significance. It is also noted that the negative sign in front of the correlation coefficient between empathy and hostility, while not statistically significantly different from zero (0), does seem to be going in the expected direction. From these correlation coefficients, it is reasonable to assume that the measures appear to be valid relative to each other. With these preliminary facts established, this chapter will now proceed with hypothesis testing.

Results of Hypothesis Testing

Before one can interpret main effects in a factorial design, inspection of any significant interactions involving those main effects should be done. Hence, an examination of the hypotheses will proceed as outlined in Chapter IV from the second order interaction through the first order interactions to the main effects.

Multivariate Analysis of Variance was used to test each of the seven hypotheses of this study. The logic for analyzing the significance of a multivariate hypothesis is suggested by Hummel and Sligo (1971) and can be described as follows: if the MANOVA test

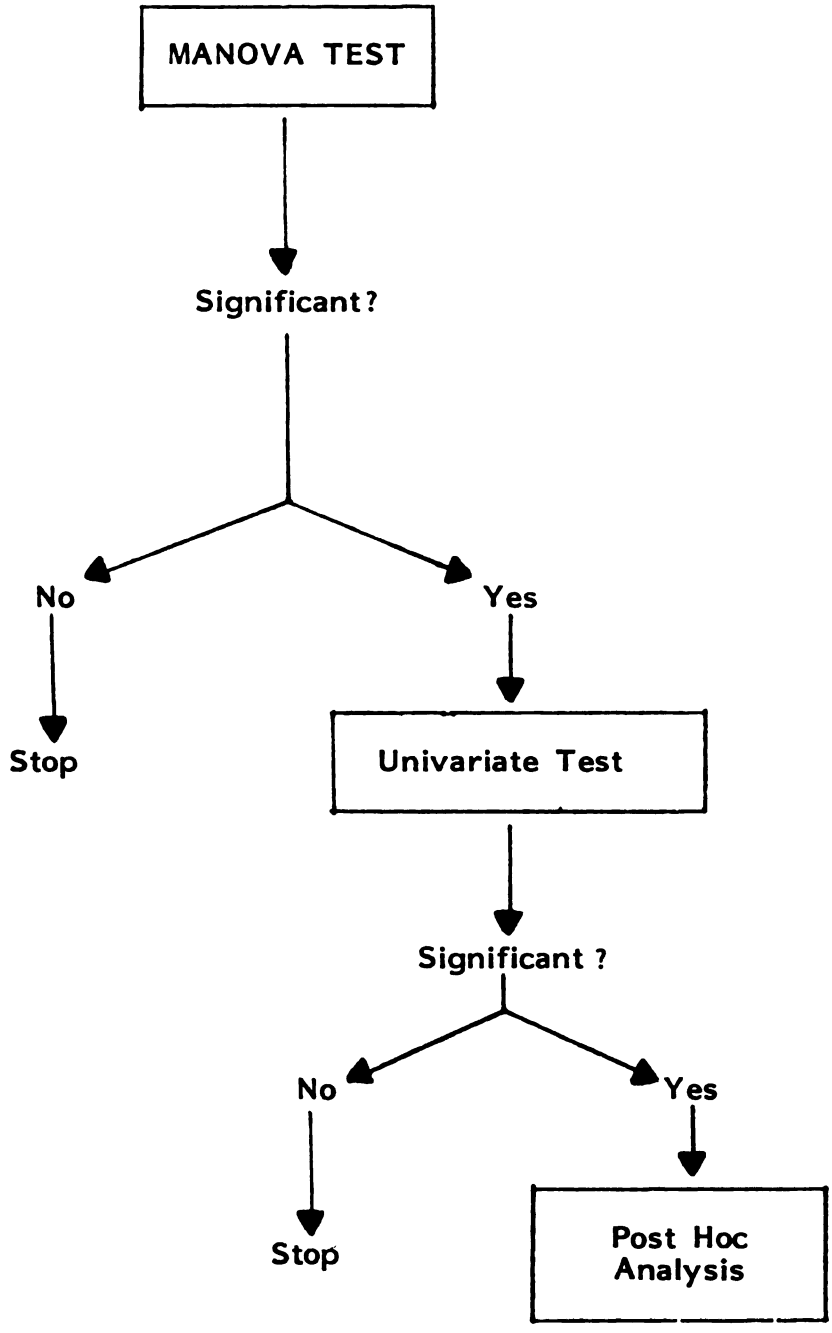


Figure 5.1. Procedure for MANOVA Test

is not significant at the stipulated alpha level, no further analysis takes place and the null hypothesis is not rejected. If the results of the MANOVA test are significant, then univariate tests are conducted to determine the variables upon which the groups differed. For those univariate tests with significance, post hoc procedures are then conducted to determine in what ways groups differed. Figure 5.1 graphically illustrates this process.

Unfortunately, pursuing the univariate tests in a post hoc fashion leads to an inflated alpha level. To control for this, a variation on the Bonferroni inequality will be employed. That is, the experiment-wise Type I error (alpha = .10) will be divided by four, the number of dependent variables (which is the number of univariate tests), to equal a comparison-wise alpha = .025.

The results of the multivariate analysis for each of the seven hypotheses is summarized in Table 5.3. To facilitate reading, a restatement of each null hypothesis in non-statistical form will be presented along with the results of analysis.

Second Order Interaction

Null Hypothesis I:

> There will be no significant sex of interviewer by sex of subject by conditions interaction as indicated by the subjects' mean scores on the four dependent variables of empathy, ease, anxiety and hostility.

Inspection of Table 5.3 shows that the multivariate test for the second order interaction is not statistically significant ($p = .909$). The null hypothesis is not rejected.

Table 5.3

MANOVA Results for Hypothesis Tests

Source of Variation	Null Hypothesis	Wilks Λ	df	Significance Level
IS x COND x SS	I	.984	4,61	.909
COND x SS	II	.888	4,61	.118
IS x COND	III	.914	4,61	.236
IS x SS	IV	.796	4,61	.007
SS	V	.908	4,61	.200
COND	VI	.930	4,61	.341
IS	VII	.803	4,61	.009

IS = Sex of Interviewer
SS = Sex of Subject
COND = Condition

First Order Interactions

Null Hypothesis II:

> There will be no significant sex of subject by conditions interaction as indicated by the subjects' mean scores on the four dependent variables of empathy, ease, anxiety and hostility.

As seen on Table 5.3, the level of significance for this hypothesis was $p = .118$ indicating that the interaction of sex of subject by condition was not statistically significant at the stipulated alpha level ($p < .10$).

Null Hypothesis III:

> There will be no significant sex of interviewer by conditions interaction as indicated by the subjects' mean scores on the four dependent variables of empathy, ease, anxiety and hostility.

Statistical significance for Hypothesis III was not obtained as can be seen on Table 5.3. With a Wilks Lambda value of .914 and a significance level of .236, the null is not rejected.

Null Hypothesis IV:

> There will be no significant sex of interviewer by sex of subject interaction as indicated by the subjects' mean scores on the four dependent variables of empathy, ease, anxiety and hostility.

Hypothesis IV is the only first order interaction that obtained statistical significance at the stipulated alpha level ($p < .10$). Inspection of Table 5.3 shows a Wilks Lambda value of .796 significant at the $p = .007$ level for this hypothesis. The null hypothesis is rejected in favor of the alternate hypothesis that there is a significant interaction between the sex of interviewer and the sex of subject factors. According to the logic of multivariate hypothesis testing, further investigation of this interaction must take place before one can interpret the significance of either the sex of interviewer main effect or the sex of subject dimension. The analysis now proceeds directly to this investigation.

Table 5.4 shows the results of the univariate tests of the dependent variables for the sex of interviewer (IS) by the sex of subject (SS) interaction.

Table 5.4

Univariate Results for the Sex of Interviewer by Sex of Subject Interaction

Univariate Test	Mean Square Between	Mean Square Error	df	F	Significance Level
Empathy	245.68	101.24	1,64	2.43	.124
Ease	767.01	60.77	1,64	12.62	.001
Anxiety	.13	16.28	1,64	.01	.930
Hostility	2.00	13.69	1,64	.15	.704

Inspection of Table 5.4 indicates that the only dependent variable upon which the groups differed significantly is ease of communication ($p = .001$). One must now inspect the groups to isolate the exact differences on the ease scale. In accordance with the logic of hypothesis testing, a post hoc test of the cell means was conducted. Table 5.5 shows the combined cell means of the univariate test--ease for the sex of interviewer by sex of subject interaction.

Figure 5.2 illustrates in graph form the combined cell means for post hoc testing of the univariate test--ease scale for the sex of interviewer by sex of subject interaction.

As can be seen from the graph in Figure 5.2, the interaction of sex of interviewer by sex of subject is disordinal. A cell means post hoc procedure between male and female interviewers within the

Table 5.5

Combined Cell Means for Sex of Interviewer by Sex of Subject Interaction: Univariate Test--Ease Scale

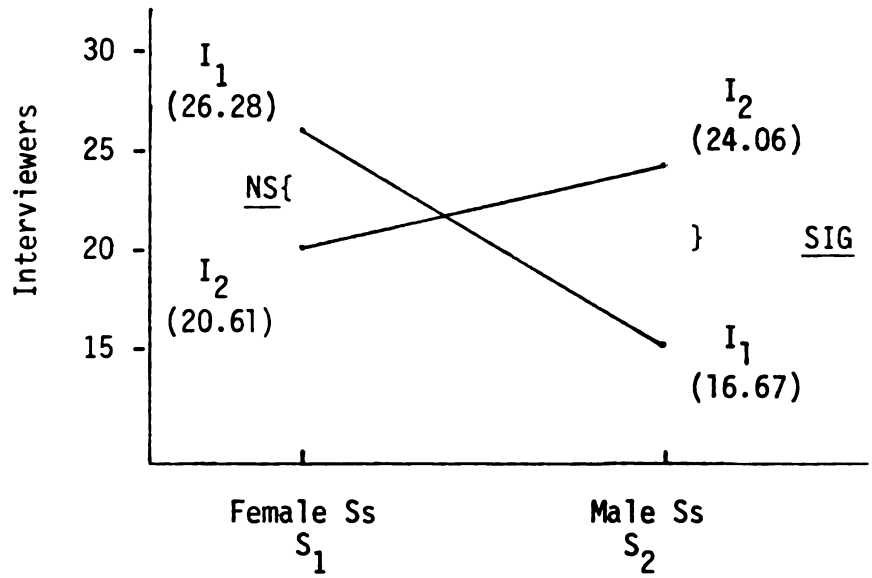
I_1	S_1	26.28 n = 18
	S_2	16.67 n = 18
I_2	S_1	20.61 n = 18
	S_2	24.06 n = 18

I_1 = Female Interviewers

I_2 = Male Interviewers

S_1 = Female Subjects

S_2 = Male Subjects



I_1 = Female Interviewers

I_2 = Male Interviewers

NS = Not Significant

SIG = Significant ($p < .025$)

Figure 5.2. Graph of Combined Cell Means for Univariate Test - Ease Scale: Post Hoc Test for Sex of Interviewer by Sex of Subject Interaction.

respective levels of subject sex indicate that when the subject is female, they are equally at ease in their communication with either a male or a female interviewer. When the subject is male, however, they are decidedly more at ease in their communication with male interviewers than with female interviewers. With this caution in mind, it is now possible to inspect the multivariate tests for the main effects.

Main Effects

Null Hypothesis V:

> There will be no significant difference between female subjects and male subjects as indicated by the subjects' mean scores on the four dependent variables of empathy, ease, anxiety and hostility.

In the summary of MANOVA results in Table 5.3, it can be observed that the multivariate test for this hypothesis was not statistically significant ($p = .200$). The null hypothesis is therefore not rejected indicating that no significant difference between male and female subjects was found.

Null Hypothesis VI:

> There will be no significant difference between interviewers in the congruent condition and interviewers in the incongruent condition as indicated by the subjects' mean scores on the four dependent variables of empathy, ease, anxiety and hostility.

Inspection of Table 5.3 also indicates that there is no significant main effect of condition ($p = .341$). Null Hypothesis VI is not rejected.

Null Hypothesis VII:

> There will be no significant difference between female interviewers and male interviewers as indicated by the subjects' mean scores on the four dependent variables of empathy, ease, anxiety and hostility.

Table 5.3 shows that this main effect, sex of interviewer, is significant. With a Wilks Lambda value of .803 and a p = .009, the null hypothesis is rejected in favor of the alternate hypothesis that there is a significant difference in how subjects perceived female and male interviewers. Again, following the logic of hypothesis testing, univariate tests of each of the dependent variables was conducted. The results of the univariate tests are listed in Table 5.6.

Table 5.6

Univariate Results for the Sex of Interviewer Main Effect

Univariate Test	Mean Square Between	Mean Square Error	df	F	Significance Level
Empathy	550.01	101.24	1,64	5.43	.023
Ease	13.35	60.77	1,64	.22	.641
Anxiety	2.35	16.28	1,64	.14	.705
Hostility	9.39	13.69	1,64	.69	.411

Inspection of Table 5.6 indicates that the empathy scale is the significant dependent variable upon which interviewers differed. The combined cell means for the empathy scale show that female interviewers ($\bar{x}$ = 21.86) received significantly higher scores on empathic understanding than male interviewers ($\bar{x}$ = 16.33). It was noted earlier in the presentation of the results for Hypothesis IV that there is a significant disordinal interaction between the sex of the interviewer and the sex of the subject. This interaction was significant for the univariate test--ease of communication indicating that male and female interviewers are perceived as significantly different on the ease scale only when the subject is male. This interaction effect, however, is not significant for the univariate test--empathy ($p = .124$, Table 5.4). In light of this observation, the main effect finding that female interviewers are perceived as significantly more empathic than male interviewers does not vary according to the sex of the subject. Null Hypothesis VII is therefore rejected in favor of the alternate hypothesis.

The main rationale for this study was to explore the effect of the variable, condition. This variable showed no significant results either by itself or as an element of an interaction at the stipulated alpha level ($p < .10$) using a multivariate analysis of variance statistical technique. Because of the major interest in this particular variable, an investigation of possible trends involving this variable will be presented in the discussion section of Chapter VI.

Summary

Seven hypotheses were tested using a multivariate analysis of variance testing procedure. Results of the analysis of the second order interaction (Hypothesis I) indicated that there was no significant interaction between the sex of interviewer by the sex of subject by the condition.

Analysis of the first order interactions (Hypotheses II, III, IV) showed that the only statistically significant interaction was the sex of interviewer by the sex of subject (Hypothesis IV). The conclusion drawn after univariate and post hoc tests were conducted was that male subjects were significantly more at ease in their communication with male interviewers than with female interviewers. Female subjects, however, appeared equally at ease in their communication with either male or female interviewers.

Analysis of the main effects (Hypotheses V, VI, VII) showed that only the sex of the interviewer (Hypothesis VII) was statistically significant ($p = .009$). Univariate tests and inspection of the combined cell means indicated that female interviewers were perceived as significantly more empathic than male interviewers regardless of the sex of the subject.

CHAPTER VI

SUMMARY

In this chapter, a summary of this study is presented and conclusions drawn from the results of data analysis are explored. A discussion of the use of representational systems in therapy and revisions for future research in this area are also included.

Summary

The primary purpose of this investigation was to explore the effect on perceived empathy and ease of communication when interviewer-therapists responded with perceptual predicates that either matched or mismatched a subject-client's internal representational system as indicated by the subject's eye movements. The concept of representational systems, developed by Bandler and Grinder in their books The Structure of Magic Volume I (1975) and Volume II (1976), and by Grinder, Bandler and DeLozier in their books Patterns of the Hypnotic Techniques of Milton Erickson, M.D. Volume I (1976) and Volume II (1977) served as the theoretical foundation for this study. Specifically, these theorists predicted that if therapists matched their clients' internal representational systems, the therapeutic relationship would be enhanced and clients would report being understood. The potential use of an easy-to-learn technique to facilitate more effective communication and the significant

implications for using representational systems in therapy provided the impetus for this study. Also, very little research had been reported on this theoretical model to date.

Internal representational systems can be identified by observing the eye movement(s) an individual makes when reflecting on experiences and by listening for the perceptual predicates an individual uses in his or her speech. Specific eye movement patterns identified by Grinder et al. (1977) apply only to right-handed individuals and to those who have not suffered severe head injuries. In reviewing the literature, it was noted that the concept of representational systems is endorsed by many theorists in the field of therapy (e.g., Mueller, 1973, Rogers, 1965; Truax & Carkhuff, 1967). The use of sensory modalities to store experience and the specific eye movement patterns were found to correspond with other investigative and experimental research in the fields of imagery (e.g., Gordon, 1972; Horowitz, 1978), cerebral asymmetry and information-processing (e.g., Deglin, 1976; Gardner, 1976; Levy, 1974; Ornstein, 1977), and eye movement research (e.g., Bakan, 1971; Gur et al., 1975; Kinsbourne, 1972, 1973).

Seventy-two undergraduate students at Michigan State University were considered the usable subject pool who voluntarily participated in this research project. These subjects, thirty-six (36) men and thirty-six (36) women, were randomly assigned to one of two treatment conditions. The treatment conditions consisted of: (1) a "congruent" interview in which interviewers responded with perceptual predicates that matched the subject's representational system(s) as indicated by eye movement; and (b) an "incongruent" interview in which interviewers

responded with perceptual predicates that mismatched the subject's representational system(s) as indicated by eye movement. All interviews were structured identically in format and content with only predicates varied according to condition. Four interviewers (two males and two females) were trained in the model of representational systems, and in accurately identifying eye movements and responding with appropriate perceptual predicates. One male interviewer and one female interviewer were assigned to each of the two treatment conditions.

Data for the dependent variables of empathy, ease, anxiety, and hostility were collected after the interviews from subjects who completed three self-report instruments: (a) Barrett-Lennard Relationship Inventory--Empathic Understanding Scale; (b) Ease of Communication Inventory designed by the author; and (c) Multiple Affect Adjective Check List--Today Form.

These data were used to determine the interactions and main effects of the three factors (independent variables) in the research design: sex of interviewer, sex of subject, and condition. Seven hypotheses were designed to test these effects. Since the dependent measures were believed to be highly interrelated, multivariate analysis of variance was used to analyze the data. Comparisons within the MANOVA model were tested at the $p < .10$ level of significance. If the multivariate test resulted in significance, univariate tests were then conducted and tested at the $p < .025$ level of significance to determine the variables upon which groups differed. For those univariate tests with significance, post hoc procedures were then conducted to determine in what ways groups differed.

Results

Seven hypotheses were tested using a multivariate analysis of variance testing procedure. Results of the analysis of the second order (3-way) interaction (Hypothesis I) indicated that there was no significant interaction among the sex of the interviewer by the sex of the subject by the condition.

Analysis of the first order (2-way) interactions (Hypotheses II, III, IV) showed that the only statistically significant interaction which occurred was between the sex of the interviewer by the sex of the subject. The conclusion drawn after univariate and post hoc tests were conducted was that male subjects were significantly more at ease in their communication with male interviewers than with female interviewers. Female subjects, however, appeared equally at ease in their communication with either male or female interviewers.

Analysis of the main effects (Hypotheses V, VI, VII) showed that only the main effect, sex of the interviewer, was statistically significant ($p = .009$). Although the results of Hypothesis IV, the interaction of sex of interviewer by sex of subject, indicated that male subjects perceived male interviewers as markedly easier to communicate with than female interviewers, the main effect, sex of interviewer, indicated that female interviewers were decidedly more empathic than male interviewers regardless of the sex of the subject. The conclusion drawn from the results of the main effects was that both male and female subjects equally perceived female interviewers as significantly more empathic than male interviewers. Even though female interviewers were seen as more empathic, this did not

facilitate ease in communication for male subjects with female interviewers. Conversely, even though male interviewers were not as empathic as female interviewers, male subjects still felt more at ease in their communication with male interviewers.

Conclusions

Five major conclusions can be drawn from the results of data analysis. First, a significant disordinal interaction occurred between the sex of interviewer by the sex of subject on the dependent variable, ease of communication. Female subjects were equally at ease in their communication with either male or female interviewers. Male subjects, however, were markedly more at ease with male interviewers than with female interviewers.

Second, a main effect was found for the sex of the interviewer on the empathic understanding dependent variable. The conclusion drawn from these results was that female interviewers were perceived as decidedly more empathic than male interviewers.

The third major conclusion is that even though male interviewers were not seen as empathic as female interviewers, male subjects still reported being more at ease in their communication with male interviewers. Conversely, even though female interviewers were seen as more empathic than male interviewers, this did not facilitate ease in communication for male subjects with female interviewers. Female subjects, however, were equally at ease with both sexes of interviewer even though female interviewers were seen as more empathic.

Fourth, no statistically significant difference was found for the main effect of condition. There was evidence, however, for male subjects to appear markedly more at ease in the congruent condition than the incongruent condition particularly when placed with a male interviewer. Discussion of this finding and the supporting data are presented in the Discussion section of this chapter.

The fifth major conclusion was that female subjects were not affected differentially by condition regardless of placement with a male or a female interviewer.

Discussion

Several questions arise from the results and conclusions of data analysis. Why do male subjects report being more at ease in their communication with male interviewers than with female interviewers while female subjects report no such difference? What can account for female interviewers being perceived as more empathic than male interviewers? What accounts for the fact that male subjects report being more at ease with male interviewers even though female interviewers are perceived as more empathic? Why do female subjects report being equally at ease with either sex of interviewer even though female interviewers are perceived as more empathic? Finally, what accounts for the differences between male and female subjects with respect to condition?

Condition

The main rationale for this study was to explore the effect of the variable, condition. Because of the major interest in this

particular variable, further investigation of the effect of condition was conducted and is presented here. Although this variable showed no statistically significant results either by itself (Hypothesis VI) or as an element of an interaction (Hypotheses I, II, III) at the stipulated alpha level ($p < .10$), the first order interaction (Hypothesis II) of condition by sex of subject was significant at the $p = .118$ level. Univariate tests of this interaction indicated that the ease of communication scale was statistically significant ($p = .01$). Further inspection of the combined cell means for this interaction suggested that males are more affected than females vis a vis the condition. That is, females are equally at ease in either condition but males tend to be more at ease in the congruent condition. These results, however, need to be interpreted with great caution since the questionable significance of the MANOVA test ($p = .118$) indicates that this could have occurred by chance alone.

Given that the instruments for measuring the variables of empathy, ease, anxiety and hostility are ostensibly reliable, and given the results, namely: (1) that male subjects are markedly more at ease with male interviewers than with female interviewers even though male interviewers are perceived as less empathic; and (2) that male subjects tend to be more at ease in the congruent condition than in the incongruent condition and significantly more comfortable than female subjects; the question now is whether or not placement of a male subject in the congruent condition with a male interviewer would compensate for the differences observed? Or is it possible

that something else uncontrolled for in the research design accounted for the differences observed?

Inspection of the combined cell means--ease of communication scale--indicate that male subjects were most comfortable with the male interviewer in the congruent condition ($\bar{x}$ = 26.11); next most comfortable with the female interviewer in the congruent condition ($\bar{x}$ = 22.78); third most comfortable with the male interviewer in the incongruent condition ($\bar{x}$ = 22.00); and least comfortable with the female interviewer in the incongruent condition ($\bar{x}$ = 10.56). This evidence suggests that male subjects tend to feel more at ease in their communication with interviewers in the congruent condition particularly if the interviewer is male. The intent of reporting these combined mean scores is only to show a possible trend rather than to present statistical test data since the significant difference on the ease scale could have occurred by chance alone. Further research on this possible trend needs to be pursued in depth with an adequate design and sufficient sample size to render a conclusion about this trend.

Based on the review of the literature in the related areas of eye movements as indicators of cerebral activation (e.g., Bakan, 1969, 1971; Kinsbourne, 1972, 1974; Kocel et al., 1972), and the research on processing sensory information (e.g., Dimond, 1977; Dimond & Beaumont, 1974; Kimura, 1967, 1973; Levy & Trevarthen, 1976), it seemed reasonable to conclude that eye movements alone were indicative of cerebral activation and the internal storing of sensory experience. This assumption, that eye movements alone

indicate representational systems, may be a faulty assumption or it may only apply to a particular type of subject. In the one reported investigation of eye movements and representational systems, Owens (1977) found that the most reliable means of determining representational systems was through a combination of observing eye movements and listening to the verbalizations of an individual rather than any other combination of eye movements, verbalizations and self-report.

While the present study assumed eye movements alone to be indicators of representational systems which interviewers then responded to with perceptual predicates that matched or mismatched the sensory system indicated by the eye movement, an important and necessary phenomenon may have been overlooked in designing the conditions of this study. Interviewers did not listen for or record subjects' verbalizations after recording the observed eye movement(s) but merely responded with predicates to match or mismatch the eye movement. It is possible that some subjects' eye movements may not have matched their own verbalizations and thus an incongruency between a subject's own "internal" and "external" representations may have existed. Not controlling for this possibility of an "internal-external incongruency" for each subject may have affected the subject's ability to perceive interviewers in the congruent condition as easier to communicate with and/or more empathic than interviewers in the incongruent condition. That is, if the subject's own representational system is not well developed or if the subject uses two or more different sensory systems to recall and represent his or her experience, an interviewer responding verbally to the system indicated

by the eye movement alone may not convey an empathic understanding of the subject's total experience. Controlling for the variable of "congruent" and "incongruent" subjects may result in significant differences on empathic understanding and ease of communication with respect to condition.

Male subjects in the congruent condition tended to be more at ease than male subjects in the incongruent condition while female subjects reported no differences between conditions. The idea of "congruency" within subjects may apply here as well resulting in fewer male subjects than female subjects representing their experience in more than one sensory system and thus responding more favorably to the congruent condition than the incongruent condition.

Reviewing the literature on lateral eye movements as indicators of cerebral activation and lateralization, it was reported by Bakan (1969, 1971) and Duke (1968) that individual male subjects tended to be more consistent in moving their eyes in one lateral direction only. Individual female subjects, however, had a greater percentage of "mixed" eye movements. It was concluded that cerebral organization and hemispheric functions in males may be more lateralized than in females. That is, the consistency of eye movement in one direction only for individual male subjects indicated that males relied on the use of one hemisphere or the other as a preferred mode of cognitive processing. Female subjects, however, displaying a "mixed" direction of lateral eye movements, relied on the use of both hemispheres thus indicating the possibility of more integration of functions between hemispheres in women than in men.

This notion of hemispheric integration for women may apply as well to the visual, auditory and kinesthetic sensory systems of the Bandler and Grinder representational scheme. The possibility exists that the eye movements of male subjects in the present study indicated the use of a more lateralized sensory organization while the eye movements for females in the present study indicated more inter-hemispheric organization of the sensory systems. If this was the case, female subjects may have found it easier to switch from one representational system to another resulting in no difference reported between conditions on the ease of communication scale. Male subjects, if more lateralized, may not have been able to switch representational systems as easily thus reporting marked differences between the congruent and incongruent conditions on the ease of communication scale.

Sex of Interviewer by Sex of Subject Interaction

The interaction of sex of interviewer by sex of subject resulted in male subjects being significantly more at ease in their communication with male interviewers than with female interviewers. Female subjects, however, reported being equally at ease in their communication with either male or female interviewers. These results are discussed in light of the previous research on eye movements as well.

In testing for the effects of cognitive style and sex of interviewer on the direction of subject eye movement, Richardson (1978) found that the sex of the interviewer significantly influenced the vertical direction of eye movements in subjects. Specifically, he found that when the interviewer was female, both male and female subjects produced more upward eye movements. When the interviewer was male, both male and female subjects produced more downward eye movements. Although Richardson's (1978) stimulus questions to subjects were of a different nature than the stimulus cues used in the present study, the results of his research may shed some light on the significant interaction which occurred in the present study.

If in fact the same phenomenon occurred during the respective interviews in this study, the eye movement representational scheme developed by Grinder et al. (1977) could have been affected by the sex of the interviewer resulting in subjects switching from a possible preferred sensory mode to another less comfortable one. Upward eye movements (visual system) and downward eye movements (auditory and kinesthetic systems) may have occurred solely because of the sex of the interviewer rather than in response to the subject's preferred mode of representing his or her experience internally. Based on Richardson's (1978) research, it would be expected then that a greater number of upward eye movements would have occurred with the female interviewers and a greater number of downward eye movements would have occurred with the male interviewers. Inspection of the interviewers' rating forms used during the interviews

(Appendix F) does reveal a similar trend in the frequency of up or down movement with respect to sex of interviewer.

Out of a total of 333 vertical eye movements reported, 132 were upward movements with 84 of these upward movements occurring with the female interviewers and 48 of these upward movements occurring with the male interviewers. The remaining vertical eye movements were downward with 117 of these downward movements occurring with the male interviewers and 84 of these downward movements occurring with the female interviewers. No statistical test was conducted on these frequencies. However, the frequencies themselves suggest that the Grinder et al. (1977) eye movement representational scheme may have been contaminated by the sex of the interviewer resulting in loss of freedom for subjects to respond in whatever representational system was most comfortable for them to recall their experiences.

If this is the case, then it would logically follow that both sexes of subjects would report significant differences with both sexes of interviewers as long as the measuring instruments were valid and reliable. However, only male subjects reported significant differences with respect to sex of interviewer. It may be then, that only female subjects are more comfortable switching representational systems and thus do not report any difference in ease of communicating with either male or female interviewers.

Sex of Interviewer

Finally, although it appears from the correlation matrix (Table 5.2, p. 92) that empathic understanding and ease of

communication are highly related (r = .62), the fact that female interviewers were perceived as more empathic yet not as easy for male subjects to communicate with as male interviewers, implies that the variables of empathy and ease may not necessarily go together in an interviewing situation. The underlying constructs for each of the instruments may differ from one another. In thinking about the research previously discussed regarding eye movements and cerebral organization and lateralization, the ease scale may not have been interpreted by subjects as referring to the interpersonal interaction between the subject and interviewer. Items on the ease scale may have instead been interpreted by subjects as referring to "internal congruency" only. Items on the empathy scale, however, clearly stated the interviewer as the focus for responses. The empathy scale was more likely interpreted by subjects as referring to the subject's perception of the interpersonal interaction of the interview situation.

Still another interpretation for the discrepancy observed between male and female subjects with regard to empathy and ease may be related to the stereotyped roles of males and females in our society. Females are more commonly seen as nurturant and empathic and as a result may be perceived as encouraging intimacy in relationships more quickly than males. If this was the response set for subjects in this study, it would follow that male subjects may have felt more uncomfortable with the level of intimacy required in disclosing their thoughts and memories of past experiences with

female interviewers in such a short period of time (fifteen minute interview).

Since female interviewers were perceived as more empathic than male interviewers by both sexes of subjects, it may be that interviewers exhibited some non-verbal behavioral cues related to the perception of empathy during the interview. Possibly female interviewers exhibited more emotion through their facial expressions or nodded their heads affirmatively to subjects while male interviewers did not display such non-verbal cues. Without more data available to analyze the components of non-verbal behavior in the interpersonal interview situation, it is difficult to sort out specifically what may have affected subjects' responses to interviewers on the empathy scale. Recommended for future research in this area is the use of videotape in order to make available non-verbal, behavioral data which can be rated objectively to determine what accounts for this finding.

Limitations

The results of this study can only be generalized to a population which meets the criteria established for the selection of subjects. Two criteria were established prior to participation: (1) individuals who were right-handed; and (2) individuals who have not suffered severe head injuries. These limitations were necessary as the eye movement representational scheme applies only to left hemisphere 'dominant' individuals. Any head injury resulting in

loss of consciousness for a period of time may disrupt the 'normal' lateralization of hemispheric functions.

Students from a large midwestern university volunteered to participate in this research. Volunteers and students may differ from other groups of individuals in the general population and thus affect the interpretation of the interview setting and/or their response set for completing the instruments. 'Cooperative' individuals' perceptions of empathic understanding and ease of communication may differ from those individuals who do not volunteer on their own.

Those who volunteered were also part of the general student population and not specifically from a client population. Bandler and Grinder indicated that individuals seek therapy when they experience limitations in their ability to represent the world. Individuals not in therapy may therefore have access to more representational systems and may be better able to transform information from one modality to another. Any generalizations made to client populations from the results of this study should be done so with great caution.

A fourth set of limitations lies within the nature of the test instruments themselves, in particular, the ease of communication scale developed by the author. Items on this instrument were checked for face validity prior to the experiment but no reliability coefficients were determined for this instrument prior to or during this study. It is imperative, therefore, that the significant results found using this instrument be interpreted with extreme caution.

Recommendations for Further Research

Further investigation in the area of representational systems seems appropriate based on the discussion of the results found in this study. The notion of using representational systems in therapy not only to establish rapport and enhance communication but also to help a client expand his or her impoverished or limited views of the world still seems too important to ignore further research in the area. Therefore, suggestions and recommendations for further research are as follows:

1. Replication of the present study controlling for 'incongruency' of representational systems that may exist within subjects by recording both eye movements and verbalizations. Interviewers could respond with predicates congruent to the system indicated by the eye movement as in the present study but analyze the data according to 'congruent' and 'incongruent' subjects.

2. Using the same stimulus cues as in the present study and controlling for 'within-subject incongruency' as described above, interviewers could respond using one of four conditions: (a) using congruent predicates to match the subject's eye movement only; (b) using incongruent predicates to mismatch the subject's eye movement only; (c) using congruent predicates to match the subject's verbalizations only; and (d) using incongruent predicates to mismatch the subject's verbalizations only. Data could be analyzed according to 'congruent' vs. 'incongruent', male and female subjects.

3. Use videotapes to verify eye movement and verbalization ratings of interviewers. Use independent raters to score for subject and interviewer responses both verbally (predicates used) and non-verbally (head nods, tone of voice, etc.).

4. Compare two different populations, namely, individuals not currently in therapy and individuals who are seeking therapy to determine if differences exist in the amount of incongruency or ability to transform from one representational system to another. Stimulus cues could be altered to include both specified and non-specified perceptual predicates.

5. Investigate the possibility of determining representational systems via EEG recording or other physiological recording devices. Alter the stimulus cues to include both specified and unspecified perceptual predicates and record brain wave activity that occurs with both eye movements and verbalizations. Predominant areas of activity may provide useful information for determining representational systems and input-output transformations.

6. Investigate how individuals' ability to form dim vs. vivid images effects the expression of representational systems.

7. Establish reliability and construct validity for the Ease of Communication scale used in this research prior to its use in further research.

These recommendations are by no means exhaustive but instead are merely a beginning of various ways to investigate the concept of representational systems developed by Grinder and Bandler. How,

specifically, to objectively measure and determine representational systems is still unclear. Although Bandler and Grinder (1976) and Grinder et al. (1977) identified two specific ways to determine a person's representational system--(1) observing reflexive eye movement patterns; and (2) listening for perceptual predicates in speech--the results of this research suggest that initial eye movement in response to reflecting on past experience may not be a strong enough indicator by itself for an interviewer to convey understanding of an individual's representation of his or her sensory experience.

Several questions still remain: How, specifically, can one identify another's representational system? Can an individual's representational system be determined by eye movement alone? If so, under what conditions? What objective measures (e.g., frequency count, initial behavior) are most effective, yet practicable, in determining representational systems? Can the same measures be used to determine representational systems for both male and female subjects? Would internally 'congruent' individuals respond more favorably to interviewers who matched their expressed representational system than internally 'incongruent' individuals?

Before one can confirm or reject the notion of representational systems and the postulated model for enhancing rapport and increasing effective communication between clients and therapists, much more research needs to be designed and implemented in this area.

APPENDICES

APPENDIX A

SOLICITATION LETTER

APPENDIX A

SOLICITATION LETTER

October 8, 1979

Hello!

I am in need of 40 women and 40 men who are willing to participate in a research project in Counseling Psychology. Participation is limited to: (1) persons who are right-handed; and (2) persons who have not suffered severe head injuries and lost consciousness for a long period of time.

Participation in this study involves a total of 30 minutes (½ hour) of your time. There are two parts: (1) participation in a structured interview for 15 minutes (you will be asked to recall past experiences in your life); and (2) completion of three, short, self-report forms of your experience of the interview (15 minutes).

This research project will be run during the day on Sunday, October 21, 1979 and on Monday evening, October 22, 1979. If you are interested and willing to participate, please sign your name, address, and phone number as well as designate whether you are male or female. You will then be assigned a specific time for an interview. It is likely that women will be assigned to interview on Sunday morning and early afternoon; men will be assigned Sunday afternoon or Monday evening.

If you are unsure of your willingness or availability to participate, please do not sign up as it is necessary for research purposes that you guarantee you will come for an interview at your assigned time. I will contact you by letter or by phone with your assigned time.

Any questions, please call me at 3-9242 during Monday mornings, Friday mornings, and on Tuesdays. Thank you for your attention and cooperation.

Sincerely,

Judy L. Ellickson
Researcher

APPENDIX B

LETTER TO INTERVIEWERS

APPENDIX B

LETTER TO INTERVIEWERS

October 9, 1979

HI!

Thanks loads for helping me out on my dissertation. There are four interviewers now ready to go: Melissa Andrea, Lew Dotterer, Ron May, and Robin Sesan. All we need now is a commitment from 40 women and 40 men to be subjects! The search for subjects is underway--I've gotten some help from the Akers Hall Residence staff and from the Area Directors in East Complex. Hopefully, they'll be able to drum up business for us.

Training is definitely scheduled for Monday, October 15, 1979 from 7:00 p.m. - 9:00 p.m. in Room 118 West Fee Hall. We will need to do several things during training:

a. overview of Bandler/Grinder model of representational systems
b. eye movement patterns
c. establish inter-rater reliability of eye movements
d. choose and practice interview conditions
e. schedule times for subjects and interviews to take place.

Each of you will be responsible for interviewing 20 subjects (15 minute interview with each subject)--10 males and 10 females. I've asked all of you to keep clear: Sunday, October 21, 1979 (9:30 a.m. to 5:00 p.m.) and Monday, October 22, 1979 (6:30 p.m. to 9:30 p.m.). Looking over what that means in terms of numbers of interviews for Sunday, I think we'd better spread that out to another night, i.e., Monday, October 29, 1979 (6:30 p.m. to 9:30 p.m.) and only schedule for doing approximately 10 interviews each on Sunday. I think this will work out better for two reasons: (1) I'll be able to follow up with assigning subjects who may have missed or not showed up; and (2) the original all day Sunday will be too much for interviewers--the conditions are demanding and need your alert attention. We can talk about this more at training on Monday, October 15, 1979.

I'm in the process of writing a training manual and will deliver a copy to each of you on Friday of this week. Please read it before training and we'll take it from there!

I'm really looking forward to working with all of you. I think it will be hard work but we can make it interesting and fun too!

See you on Monday, October 15, 1979 in Room 118 West Fee Hall at 7:00 p.m.

APPENDIX C

INTERVIEWER TRAINING MANUAL

APPENDIX C

MANUAL FOR INTERVIEWERS

Introduction

As interviewers for this study, your job will be to interview twenty (20) undergraduate students--ten (10) males and ten (10) females. The interviews will last for 15 minutes and will be structured in such a way that you will ask subjects to recall and describe six past experiences in their lives. The same six stimulus statements will be used throughout all interviews.

In general, you have three tasks to accomplish during each interview. First, you will introduce one of the six stimulus statements (e.g., "I'd like you to think about your earliest memory from your first day of school") and watch for the eye movement pattern the subject displays. Specific eye movements signify the perceptual mode a person is using to organize his or her experiences. (Eye movement patterns will be discussed later in this manual). Secondly, depending on the direction of the eye movement, you will respond with a verbal statement asking them to describe their experience to you. Your verbal response will include perceptual predicates which match or mismatch the perceptual mode of the subject's eye movement. (Perceptual predicates will be discussed later in this manual.) Thirdly, you will record for each stimulus statement: (1) the eye movement of the subject; and (2) which representational system you

used verbally to respond to the subject. (Representational systems will be discussed later also.)

Model of Representational Systems

The theory of eye movements, perceptual predicates and representational systems was developed by John Grinder, Richard Bandler, Judith DeLozier and Leslie Cameron-Bandler in their books: The Structure of Magic, Vols. I & II; Patterns of the Hypnotic Techniques of Milton Erickson, Vols. I & II; They Lived Happily Ever After.

These authors suggested that although people receive sensory information continually through all five sensory input channels--i.e., hearing, sight, touch and movement, taste, smell--people more typically rely on and make meaning from the three channels of sight (vision), hearing (audition), and touch or movement (kinesthesis). Because we are limited physiologically and also do not have the cognitive capacity to consciously process all the sensory input we receive, people "chunk" the sensory information into categories that enable them to derive meaning from their experiences and allow them to take in and process more information. This processing of "chunking" information is referred to as creating representational systems, maps, or models of the world. Most people organize and store their experiences using the perceptual modes of vision, audition, and kinesthesis and thus can be said to be using a visual representational system, an auditory representational system, or a kinesthetic representational system.

There are two ways available to identify the perceptual mode a person is using to organize and represent their experiences: (1) watching the eye movement patterns a person displays when reflecting; (2) listening for the perceptual predicates a person uses in his or her speech. Perceptual predicates are the verbs, adverbs, and adjectives in speech. Thus, both eye movement patterns and perceptual predicates reveal which representational system a person is currently using to access and organize stored perceptual information.

Typically, people develop one representational system as their preferred mode. This is referred to as their primary representational system. The use of one system primarily, however, does not preclude the use of the other systems to represent their experiences. In addition to this primary representational system, some people may also have a lead system. While the representational system can be conscious to the individual (if brought to his or her attention), the lead system is unconscious and not easily available to the individual.

Eye Movement Patterns

The eye movement patterns suggested by Grinder et al. (1977), and Cameron-Bandler (1978) apply most consistently to right-handed individuals and to people who have not suffered severe head injuries since eye movements do correspond to hemispheric organization and activation in the brain. Specifically, these theorists suggest the following eye movements:

1. Up and to the left* -- visual 'eidetic' accessing
2. Up and to the right* -- visual 'constructed' accessing
3. Defocused at midline -- visual accessing
4. Laterally left or right* -- auditory accessing
5. Down and to the left* -- auditory accessing
6. Down and to the right* -- kinesthetic accessing

For purposes of this study, we will not make distinctions between types of information processing (i.e., 'eidetic' or 'constructed'). Rather, we will concentrate only on the three main repesentational systems: visual, auditory, and kinesthetic systems. Thus, a person will be considered as organizing his or her experience visually if their eyes move up; auditorily if their eyes move laterally or down left; and kinesthetically if their eyes move down right. These eye movement patterns are represented visually on the following page of this manual.

Both the primary representational system and the lead system are reflected in an individual's eye movements. When asked to think about a past experience, a person may use one eye movement or may use two eye movements. Only one eye movement indicates the use of the representational system that can be made conscious to the individual. When two eye movements occur, the first movement indicates the lead system (unconscious) while the second movement indicates the conscious representational system. For example, consider a person who

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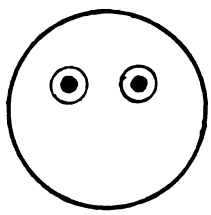
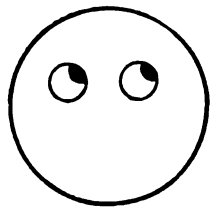
*Right or left refers to the subject's right or left.

EYE MOVEMENT PATTERNS*



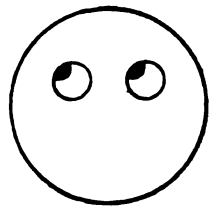
Defocused

or



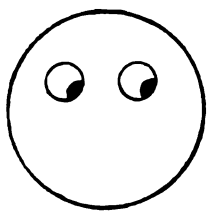
Up and Left
(eidetic)

or



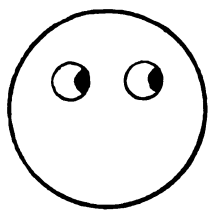
Up and Right
(constructed)

= VISUAL



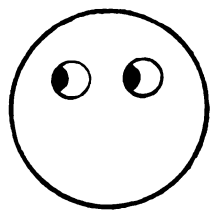
Down and Left

or



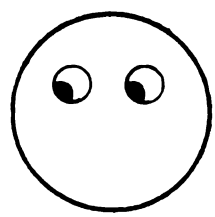
Left Lateral

or



Right Lateral

= AUDITORY



Down and Right

= KINESTHETIC

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*Remember that as you are looking at these pictures, the left or right direction of the eyes is determined from the subject's left or right.

is asked to think about a specific past experience and moves his/her eyes first up and left, then down and right. The lead system (unconscious) for this person is visual but the representational system (conscious) is kinesthetic. If asked to describe what picture they are seeing, subjects will have a difficult time doing so as they are not aware of forming any visual picture at all. But, if asked to describe what they're feeling or what they got in touch with, they will be able to do so without difficulty.

Perceptual Predicates

In this study, we will not be paying attention to the perceptual predicates that subjects use to describe to you their experiences. Instead, you will be forming your verbal responses to subjects using predicates which either match or mismatch the subject's representational system as indicated by eye movement. Therefore, to familiarize you with this part of the Bandler and Grinder model, a brief discussion of perceptual predicates follows.

Perceptual predicates are the adjectives, adverbs and verbs which people use in their speech to signify the perceptual mode they are using to organize their experiences both to themselves and to others. In other words, perceptual predicates indicate the representational system currently being used. Again, people most frequently use the visual, auditory, and kinesthetic representational systems.

For example, if a person is representing his/her experience visually, they may say: "I see what you mean"; "I get the picture";

"It looks really clear to me." If a person is representing their experiences auditorily, they may say: "I hear what you're saying"; "That sounds good to me"; "I can get in tune with that." If a person is representing their experiences kinesthetically, they may say: "I'm in touch with what you're saying"; "I can get a handle on that"; "I get a feel for what that means to you."

Table I gives examples of perceptual predicates, classified by representational system.

Table I

Examples of Perceptual Predicates

Visual	Auditory	Kinesthetic
see	hear	touch
picture	tune	grasp
focus	harmonize	handle
clear	sounds like	feel
perspective	listen	contact
looks	quiet	hold
watch	loud	hard
view	rings	soft

Response Conditions

Once you have asked a subject to think about some past experience (stimulus cues) and have identified the representational system the subject is using consciously (as indicated by eye movement), you now formulate your responses using predicates which are congruent or incongruent with their representational system. Whether you are to respond in the same representational system (congruent) or in a different system (incongruent) depends on which response condition you are assigned to do. Response conditions will be assigned during training.

Table II (taken from Grinder & Bandler, The Structure of Magic, Vol. II, p. 15) presents some examples of responses in each representational system corresponding to certain meanings you wish to communicate to subjects.

Table II

Examples of Responses

Meaning	Visual	Auditory	Kinesthetic
Describe more of your present experience to me.	Show me a clear picture of what you see.	Tell me in more detail what you are saying.	Put me in touch with what you are feeling now.
I (don't) understand you.	I see (don't see) what you are saying.	I hear (don't hear) you.	What you are saying feels (doesn't feel) right to me.

Being able to respond using perceptual predicates in any representational system requires that you unlearn some habits you may have acquired. Try to be aware of the automatic phrases you normally use when communicating to another person such as "it sounds like ..." or "I see ..." or "so you feel ..." Use these phrases only when appropriate to the eye movement of the subject and depending on which response condition you are using.

Training

Since you will need to identify eye movements and be able to respond appropriately, practice during training will consist of the following stages:

1. Watch a videotape demonstration and identify representational systems as indicated by eye movement.
2. Practice using stimulus statements to elicit eye movement from each other. Identify the representational system being used. Think about asking for their description using congruent perceptual predicates.
3. Present stimulus statement and identify eye movement. Formulate and give your responses congruently.
4. Repeat step 3 but respond with incongruent predicates.
5. Practice the series of six stimulus statements and simulate an interview using congruent responses.
6. Practice the series of six statements and simulate an incongruent interview.

Based on your experience and facility in using either the congruent or incongruent conditions, we will determine which two of you (one male, one female) will consistently use the congruent condition

during the experiment, and which two of you will use the incongruent condition during the experiment.

Procedures

The students who are subjects are being recruited at this time from residence halls on the East side of campus. When they appear for an interview, they will be asked to sign a consent form and complete an information form. After doing so, they will be introduced to you and the interview begins. Once you have completed the interview with them, you are to send them back to the investigator to complete three, short questionnaires.

Although very unlikely, if a student becomes very upset for some reason during the interview, you are to respond to them as you would any person in distress.

If the student asks for more information about the study, inform them that the investigator will answer questions after they have been interviewed and have completed the questionnaires.

Stimulus Cues

1. I'd like you to think about your earliest memory on your first day of school.
2. I'd like you to remember now your high school graduation.
3. I'd like you to think about going into an exam.
4. I'd like you to think about experiencing a day at the beach.
5. I'd like you to think about a time when you knew someone really cared about you.
6. This is the last one. I'd like you to think about a time when you knew you accomplished an important goal.

Examples of Responses

Describe more to me	Understanding
(A) Would you amplify your description?	(A) If I hear you right, what you're saying is ...
(A) Tell me about your experience.	(A) Yes, now I'm tuned into what you're experiencing.
(V) You have a picture now of that experience? Describe to me what you see.	(A) That experience strikes a chord for me.
(V) Show me what it looks like to you.	(V) I see what you mean.
(K) Give me a feel for your experience right now. Describe it to me. I'd like to grasp it.	(V) Let me see if I understand you. You're seeing yourself ...
(K) Let me get in touch with your experience now. Let me in on how it feels to you.	(V) The picture I have of your experience is ...
	(K) That's a rough experience. Must be hard for you to feel that now.
	(K) If I grasp what you're saying, your experience feels ...
	(K) I think I get a hold (handle) on what's important about that experience to you.

APPENDIX D

VIDEOTAPE OF EYE MOVEMENT PATTERNS

APPENDIX D

VIDEOTAPE OF EYE MOVEMENT PATTERNS

Demonstration #1 (Karen - instructions #0)

Movement 1 -- Right level (very quick, after talking)
Movement 2 -- Left level
Movement 3 -- Up left, then up right
Movement 4 -- Closed
Movement 5 -- Down left
Movement 6 -- Up left
Movement 7 -- Down right
Movement 8 -- Up left, then up right
Movement 9 -- Defocused

Demonstration #2 (John - instructions #176)

Movement 1 -- Left level
Movement 2 -- Down right
Movement 3 -- Closed
Movement 4 -- Down left
Movement 5 -- Up left
Movement 6 -- Right level
Movement 7 -- Up right
Movement 8 -- Defocused

Demonstration #3 (John - instructions #199)

Movement 1 -- Down right
Movement 2 -- Down right
Movement 3 -- Left level
Movement 4 -- Defocused

Demonstration #3 (John - continued)

Movement 5 -- Up right, then down left
Movement 6 -- Up right
Movement 7 -- Down right, then up right
Movement 8 -- Down right

Demonstration #4 (Judy - instructions #155)

Movement 1 -- Down right
Movement 2 -- Down right, then up left
Movement 3 -- Up right
Movement 4 -- Up right, then down right
Movement 5 -- Defocused
Movement 6 -- Left level
Movement 7 -- Down right (quick)
Movement 8 -- Up left

Demonstration #5 (Karen - questions #88)

Movement 1 -- Up left
Movement 2 -- Up left
Movement 3 -- Up left

Demonstration #6 (John - questions #227)

Movement 1 -- Down right
Movement 2 -- Defocused
Movement 3 -- Up right, then down right
Movement 4 -- Right level
Movement 5 -- Up right
Movement 6 -- Up right

APPENDIX E

EYE MOVEMENT TRAINING FORM

APPENDIX E

EYE MOVEMENT TRAINING*

Demonstration #

Movement 1 --	Up right	Up left	Defocused
	Level right	Level left	Eyes closed
	Down right	Down left	
Movement 2 --	Up right	Up left	Defocused
	Level right	Level left	Eyes closed
	Down right	Down left	
Movement 3 --	Up right	Up left	Defocused
	Level right	Level left	Eyes closed
	Down right	Down left	
Movement 4 --	Up right	Up left	Defocused
	Level right	Level left	Eyes closed
	Down right	Down left	
Movement 5 --	Up right	Up left	Defocused
	Level right	Level left	Eyes closed
	Down right	Down left	
Movement 6 --	Up right	Up left	Defocused
	Level right	Level left	Eyes closed
	Down right	Down left	
Movement 7 --	Up right	Up left	Defocused
	Level right	Level left	Eyes closed
	Down right	Down left	
Movement 8 --	Up right	Up left	Defocused
	Level right	Level left	Eyes closed
	Down right	Down left	
Movement 9 --	Up right	Up left	Defocused
	Level right	Level left	Eyes closed
	Down right	Down left	

*To be used with videotaped demonstration. Please circle. If two eye movements, note first as 1, second as 2.

APPENDIX F

EYE MOVEMENT AND RESPONSE RATING FORM

APPENDIX F

EYE MOVEMENT AND RESPONSE RATINGS

HELLO. My name is _____. For the next 10-15 minutes I will be sharing a series of statements with you that I want you to think about. When you do that, I will then want you to describe what you're thinking about to me. Respond only after I request the information from you. Are you ready? OK, let's begin.

(Please circle eye movement. If two eye movements, note first as 1, second as 2).

1. I'D LIKE YOU TO THINK ABOUT YOUR EARLIEST MEMORY ON YOUR FIRST DAY OF SCHOOL.

Up right (V)	Up left (V)	Defocused (V)	Visual
Level right (A)	Level left (A)	Eyes closed (request with un-	Auditory
Down right (K)	Down left (A)	specified pred.)	Kinesthetic

2. I'D LIKE YOU TO REMEMBER NOW YOUR HIGH SCHOOL GRADUATION.

Up right (V)	Up left (V)	Defocused (V)	Visual
Level right (A)	Level left (A)	Eyes closed (request with un-	Auditory
Down right (K)	Down left (A)	specified pred.)	Kinesthetic

3. I'D LIKE YOU TO THINK ABOUT GOING INTO AN EXAM -- LIKE A MIDTERM EXAM.

Up right (V)	Up left (V)	Defocused (V)	Visual
Level right (A)	Level left (A)	Eyes closed (request with un-	Auditory
Down right (K)	Down left (A)	specified pred.)	Kinesthetic

4. I'D NOW LIKE YOU TO THINK ABOUT EXPERIENCING A DAY AT THE BEACH.

Up right (V)	Up left (V)	Defocused (V)	Visual
Level right (A)	Level left (A)	Eyes closed (request with un-	Auditory
Down right (K)	Down left (A)	specified pred.)	Kinesthetic

5. I'D LIKE YOU TO THINK ABOUT A TIME WHEN YOU KNEW SOMEONE REALLY CARED ABOUT YOU.

Up right (V)	Up left (V)	Defocused (V)	Visual
Level right (A)	Level left (A)	Eyes closed (request with un-	Auditory
Down right (K)	Down left (A)	specified pred.)	Kinesthetic

6. THIS IS THE LAST ONE. I'D LIKE YOU TO THINK ABOUT A TIME WHEN YOU ACCOMPLISHED AN IMPORTANT GOAL.

Up right (V)	Up left (V)	Defocused (V)	Visual
Level right (A)	Level left (A)	Eyes closed (request with un-	Auditory
Down right (K)	Down left (A)	specified pred.)	Kinesthetic

Thank you for your participation in this part of the study. If you'll now go back to Room 137 Akers, the Auditorium, there are some forms for you to complete that should take about 10-15 minutes. Once you've completed the forms, your participation in the study will be completed.

APPENDIX G

GUIDELINES FOR RESPONSE CONDITIONS

APPENDIX G

GUIDELINES FOR RESPONSE CONDITIONS

Interview for 15 minutes
Bring watch
Bring other materials to study if subjects do not show up.
Send subjects back to Room 137 Akers (Aud.) after each interview.
Indicate on rating form direction of Ss eye movement for each statement.
Indicate on rating form how you responded.
Try to not move your own eyes when asking questions or making responses.

Guidelines for Responding

Congruent Condition:

1. Respond congruently throughout all interviews.
2. If only one eye movement, respond congruently.
3. If two eye movements, respond congruently to second movement only.
4. For each stimulus statement, respond congruent to eye movement even if eye movement is different from previous stimulus statement.
5. Ignore perceptual predicates in subjects' description. Respond in system indicated by eye movement to the stimulus statement.
6. If eyes are closed, repeat stimulus statement.
7. If you can't identify movement, repeat stimulus statement.

Incongruent Condition:

1. Respond incongruently throughout all interviews.
2. If only one eye movement, respond with either of the other two systems.
3. If two eye movements, respond with the other system not expressed in the eye movement, i.e., if eyes move up then down right (V then K) respond with Auditory predicates only.
4. For each stimulus statement, respond incongruently to eye movement for that stimulus statement.
5. Ignore perceptual predicates used by subjects in their description of their experience. Respond incongruently to eye movement elicited by stimulus statement.
6. If eyes are closed, repeat statement.
7. If you can't identify movement, repeat statement.

APPENDIX H

APPOINTMENT NOTICE TO SUBJECTS

APPENDIX H

APPOINTMENT NOTICE TO SUBJECTS

Thank you for volunteering to participate in my research project! As you know, there are two parts involved: (1) participation in a 15 minute interview; and (2) completion of three short questionnaires. All information will be coded anonymously and will be kept confidential.

Please come to Room 137 Akers Hall (Auditorium) on _____

at _____.

At that time, you will be asked to sign a consent form for participation in this study as well as complete a brief information form. You will then be introduced to an interviewer.

Upon request, I will be happy to share the results of this research project with you once all data have been collected and analyzed.

I greatly appreciate your cooperation and participation.

Judy Ellickson
353-9242

APPENDIX I

CONSENT FORM

APPENDIX I

CONSENT FORM

1. I have freely consented to take part in a scientific study being conducted by Judy Ellickson under the supervision of Dr. William C. Hinds, Professor, College of Education.

2. The study has been explained to me and I understand the explanation that has been given and what my participation will involve.

3. I understand that I am free to discontinue my participation in the study at any time without penalty.

4. I understand that the results of the study will be treated in strict confidence and that I will remain anonymous. Within these restrictions, results of the study will be made available to me at my request.

5. I understand that my participation in the study does not guarantee any beneficial results to me.

6. I understand that, at my request, I can receive additional explanation of the study after my participation is completed.

Signed _____

Date _____

APPENDIX J

INFORMATION FORM

APPENDIX J

INFORMATION FORM

Thank you for participating in this study. Before beginning, I would like some information from you that is important in this research effort. All information will be kept confidential. Please take a few minutes to complete this form.

NAME: _____ AGE:_____

SEX: M F (Please circle)

ACADEMIC MAJOR: _____

YEAR IN SCHOOL: (Please circle)

Freshman Sophomore Junior Senior Other

WHICH HAND DO YOU WRITE WITH? (Please circle) Right Left

WHICH HAND DO YOU PREFER TO USE FOR MOST ACTIVITIES? (Please circle)

Right Left

HAVE YOU EVER HAD A SERIOUS HEAD INJURY WHERE YOU HAVE BEEN UNCONSCIOUS AS A RESULT OF THE INJURY? (Please circle)

Yes No

IF YES, ANSWER THE FOLLOWING QUESTIONS AS BEST YOU CAN.

HOW LONG WERE YOU UNCONSCIOUS?_____

DID YOU HAVE ANY AFTER-EFFECTS? _____

_____

_____

When you have completed this form, please return it to the research assistant and have a seat. Someone will be with you in a moment to begin the study. Thank you.

APPENDIX K

INTERVIEWER RATING FORM:

EMPATHIC UNDERSTANDING SCALE

APPENDIX K

INTERVIEWER RATING SCALE

Please do not write your name on this form. It will be coded anonymously and your answers used for research purposes only.

Below are listed a variety of ways that one person could feel or behave in relation to another person. Please consider each statement with respect to whether you think it is true or not true in terms of the interviewer you have just talked with. Mark each statement in the left margin according to how strongly you believe it is true or not true. PLEASE MARK EVERY ONE. Write in +1, +2, +3, or -1, -2, -3, to stand for the following answers:

+1 I believe that it is probably true, or more true than untrue.
+2 I believe it is true.
+3 I strongly believe that it is true.

-1 I believe that it is probably untrue, or more untrue than true.
-2 I believe it is not true.
-3 I strongly believe that it is not true.

___ 1. S/he tried to see things through my eyes.

___ 2. S/he understood my words but not the way I felt.

___ 3. S/he was interested in knowing what my experiences meant to me.

___ 4. S/he nearly always knew exactly what I meant.

___ 5. At times s/he jumped to the conclusion that I felt more strongly or concerned about something than I actually do.

___ 6. Sometimes s/he thought that I felt a certain way, because s/he felt that way.

___ 7. S/he understood me.

___ 8. Her/his own attitudes toward some of the things I said, or did, stopped her/him from really understanding me.

___ 9. S/he understood what I said from a detached, objective point of view.

__ 10. S/he appreciated what my experiences felt like to me.

__ 11. S/he did not realize how strongly I felt about some of the things we discussed.

__ 12. S/he responded to me mechanically.

___13. S/he usually understood all of what I said to her/him.

__ 14. When I did not say what I meant at all clearly, s/he still understood me.

___15. S/he tried to understand me from her/his own point of view.

___16. S/he could be fully aware of my feelings without being distressed or burdened by them herself/himself.

APPENDIX L

INTERVIEW RATING FORM:

EASE OF COMMUNICATION SCALE

APPENDIX L

INTERVIEW RATING SCALE

Please do not write your name on this form. It will be coded anonymously and your answers used for research purposes only.

Using the following scale, place the number in the space provided which best describes your experience of this interview:

+3 - I strongly agree.
+2 - I agree.
+1 - I agree slightly more than I disagree.

-1 - I disagree slightly more than I agree.
-2 - I disagree.
-3 - I strongly disagree.

_____ 1. This interviewer tried to get me to look at things differently than the way I wanted to.

_____ 2. I felt it was easy to convey my ideas to this interviewer.

_____ 3. Some of the things the interviewer said made it easier for me to go on talking.

_____ 4. This interviewer seemed to miss the point I was trying to get across.

_____ 5. This interviewer is a person I would come back to see again.

_____ 6. I felt uncomfortable at times during the interview.

_____ 7. It seemed that this interviewer tried to put words into my mouth when I was trying to say something.

_____ 8. This interviewer realized and understood what my experiences were like for me.

_____ 9. This interviewer had a hard time seeing things as I do.

_____10. During the interview, I felt I could express myself and my experiences easily.

_____11. This interviewer made comments that were right in line with what I was saying or thinking.

_____12. This interviewer interrupted my flow of thinking.

APPENDIX M

FOLLOW-UP LETTER TO SUBJECTS

APPENDIX M

FOLLOW-UP LETTER TO SUBJECTS

Dear _____:

Although this letter is somewhat delayed, I want to personally thank you for your cooperation and participation in my dissertation research during Fall term. As you know, I was not able at the time of data collection to give you more information about the theory which served as the foundation of this project. I would now like to share with you the theory and my thoughts in designing this research. The results are still not analyzed completely at this point but if you are interested in further elaboration and/or feedback, we can set up a time to meet in the near future.

The theory upon which my study was based is a model for effective communication and therapy developed by Richard Bandler, John Grinder, Judith DeLozier, and Leslie Cameron-Bandler who have written the following books: The Structure of Magic I (1975), and Volume II (1976); Patterns of the Hypnotic Techniques of Milton Erickson, M.D. Volume I (1976) and Volume II (1977); and They Lived Happily Ever After (1978). These theorists state that we, as human beings, receive information from the world around us through all five sensory systems of seeing, hearing, touching, tasting and smelling. However, most information comes to us through three main

sensory channels--visual, auditory, and kinesthetic (touch and movement) modalities.

Because we are limited physiologically and also do not have the cognitive capacity to consciously process all the sensory input we receive, people "chunk" the sensory information into categories. These categories enable us to derive meaning from our experiences and allow us to attend to and process more information. This process of "chunking" information is referred to as creating representational systems, maps, or models of the world. Most people organize and store their experiences using the perceptual modes of vision, audition, and kinesthesis and thus can be said to be using a visual representational system, an auditory representational system, or a kinesthetic representational system.

Bandler and Grinder identified two ways to identify the perceptual mode a person is using to organize and represent their sensory experiences: (1) watching the eye movements a person displays when thinking about or recalling experiences; and (2) listening for certain verbs, adverbs and adjectives called "perceptual predicates" that a person uses in his or her speech. Both eye movements and perceptual predicates indicate the representational system a person is currently using to access and organize perceptual information and experience.

Specific eye movement patterns are listed in Patterns of the Hypnotic Techniques of Milton Erickson, M.D. Volume II (1977, p. 35). Briefly, the theory states that if an individual's eyes go up, the person is seeing internal visual images. If the eyes move laterally

or down and to the left, the person is hearing sounds or conversations in the mind's ear. If the eyes move down and to the right, the person is having a feeling or a body sensation (kinesthetic). These patterns of eye movement apply only to right-handed individuals and to those who have not suffered severe head injuries since the direction of eye movement corresponds to hemispheric organization and activation in the brain.

Perceptual predicates in a person's speech may also indicate particular representational systems. For example, if a person is representing his or her experience visually, they may say: "I see what you mean"; "I get the picture"; "It looks really clear to me." If a person is representing their experience auditorily, they may say: "I hear what you're saying"; "I can get in tune with that"; "That sounds good to me." If a person is representing their experience kinesthetically, they may say: "Put me in touch with what you mean"; "I can get a handle on that"; "What you are saying feels right to me."

Grinder and Bandler also believe that when two people are communicating with one another, misunderstanding may arise because the two people involved may be communicating in two different representational systems. They may report feeling misunderstood or ill at ease when communicating their experiences to someone who does not "speak the same language" because their words and eye movements indicate the use of different representational systems.

This theory of eye movements, predicates and representational systems briefly described above, served as the theoretical foundation

for my research project. Specifically, I was interested in whether or not you would report being understood and more at ease in your communication with an interviewer who responded congruently to the representational system you were using to recall experiences than with an interviewer who used predicates which mismatched your representational system. Two interview conditions were thus established and each of you were randomly assigned to one of the conditions. The two conditions were: (1) a "congruent" interview where the interviewer asked you to recall an experience, watched the direction of your eye movement and responded with perceptual predicates which matched your representational system as indicated by your eye movement; and (2) an "incongruent" interview where the interviewer asked you to recall an experience, watched the eye movement and then responded with perceptual predicates that mismatched your representational system. All of you were asked to recall the same six experiences (e.g., "I'd like you to think about your earliest memory on your first day of school"). The only variable between conditions was the interviewers' use of congruent or incongruent predicates in response to your eye movement as you recalled the experience. At the end of your respective interview, you were asked to complete three self-report questionnaires. These instruments were designed to measure your belief in being understood (misunderstood) and at ease (ill at ease) in your communication with the interviewer.

Since all the data have not been completely analyzed at this point, it is impossible to make any statements about how accurate the theory is. Because both males and females participated in this

project, there may be a difference between how males and females responded to the interview conditions and/or the sex of the interviewer.

If you are interested in the final results and/or further elaboration of this research, two options are available: (1) you may locate my dissertation in the Erickson Hall Instructional Resources Center at the end of Spring term 1980; or (2) you may contact me at 353-9242 during weekdays by February 18, 1980 to set up a time in the near future when those of you who are interested can meet for discussion.

Thank you again for your cooperation and participation in this study.

Sincerely,

Judy Ellickson, M.S.
Department of Counseling and
Educational Psychology

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REFERENCES

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