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# The Use of Sensory Predicates to Predict Responses to Sensory Suggestions

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# THE USE OF SENSORY PREDICATES TO PREDICT RESPONSES TO SENSORY SUGGESTIONS

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ABSTRACT

The Use of Sensory Predicates to Predict

Responses to Sensory Suggestions

by

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A scale consisting of eight suggestions worded with specific sensory predicates was administered to a large undergraduate introductory psychology class. Following the presentation of the suggestions, Self-Scoring Forms were filled out to assess the subjects' response to auditory (A), visual (V), and kinesthetic (K) suggestions. Prior to the conclusion of the session, subjects were asked to write a brief essay describing their experience of the suggestion portion of the session. Subject essays were content analyzed for the use of predicates (including, but not only A, V, and K). Frequency of usage of A, V, and K predicates were compared with responses to A, V, and K suggestions to determine the amount of consistency between preference for the use of a specific category of sensory predicates and responsiveness suggestions worded in similar language. No significant correlations between the use of specific sensory predicates and response to specific sensory suggestions were found.

(109 pages)

# CHAPTER I

## PROBLEM

In recent decades there has been an increasing emphasis on the importance of communication in psychotherapy. Some therapeutic models (Rogers, 1957; Gordon, 1970) have explicitly stressed the methods of communication as the primary focus of their techniques while others have implicitly accepted the importance of communication while focusing primarily on changing other aspects of a client's behavior. Some models of psychopathology (Bateson, 1975; Glasser, 1965) have ascribed a causal role to poor communication in the development of schizophrenia and poor or negative self-images. Several authors (Bach & Wyden, 1968; Gordon, 1970) have expounded the value of improved communication as the primary facilitative technique in resolving conflicts between spouses, parents and children, teachers and children, and supervisors and workers.

The importance of understanding the client's point of view in psychotherapy was recognized by psychotherapists of the past (Alder, 1929; Sullivan, 1954) and the empathic ability of psychotherapists and counselors was stressed by Rogers (1957) and empirically demonstrated as a cure-related asset of successful therapists regardless of their therapeutic paradigm (Berenson & Carkhuff, 1967).

Rapidly gaining followers, Neurolinguistic Programming is the practical model of communication and cognition developed by Richard

Bandler and John Grinder (1975) and Grinder and Bandler (1976). It incorporates a theoretical model of cognition with the recent neurological findings of the "split-brain" research of Sperry (1961, 1964), Gazzaniga (1967) and others--hence, the term Neurolinguistic Programming. Bandler and Grinder's model or "meta-model" as they refer to it has been drawn from many different referents. In many cases they have made relatively large inferential leaps from the sources they cited in their meta-model (Shaw, 1977). Nonetheless, they have described their model as being derived from the observation of therapists recognized as "masters" in their field, and it is perhaps this ability of the model to synthesize information from various fields outside the realm of psychotherapy with observations of well-respected practitioners, that has caused the wide spread enthusiasm for Neurolinguistic Programming (NLP).

NLP is based on the systematic observation and analysis of human communication patterns. Proponents say that most people who have normal cerebral organization process visual information using images, auditory information using sounds, and kinesthetic information using feelings, emotions, and bodily sensations.

The originators of NLP (Bandler & Grinder, 1979) have made extraordinary claims for their model. They claim to be able to cure phobias and learning disabilities in less than an hour and in just a few sessions overcoming smoking, overeating and insomnia can be accomplished. According to advocates of NLP, through the use of their techniques, the interactions of couples, families and

organizations can be modified to allow functioning that is more satisfying and productive.

## A Brief Review of That Part of Bandler and Grinder's Model That is Relevant to this Study

Bandler and Grinder (1975) and Grinder and Bandler (1976) contend that sensory representation occurs primarily through the mediation of the auditory, visual, and kinesthetic sensory input channels. They define the kinesthetic channel as including not only interoceptive stimulation but also visceral and emotional sensation.

The auditory, visual and kinesthetic sensory input channels provide an ongoing stream of information which is the basis for an individual's cognitive representation of external sensory stimuli. Grinder and Bandler (1976) state that most individuals demonstrate a preference for one of three sensory input channels as a means for representing and later articulating their experience. They refer to these three styles of representing and communicating as auditory (A), visual (V), and kinesthetic (K). When a person shows a preference for one of these sensory channels, Bandler and Grinder refer to this channel as that person's primary representational system (PRS).

> Bandler and Grinder view representation as a necessary but inexact symbolization of reality. This theoretical perspective derives from characteristics of the human central nervous system as well as from the field of General Semantics. According to Bandler and Grinder, representations are linguistically coded and subsequently expressed through metaphorical language. The rules of this language expression are the theoretical domain of the

> Transformational Grammarians (Bandler & Grinder, 1975 p. 8).
>
> Bandler and Grinder believe individuals demonstrate a preference for either an auditory, visual or kinesthetic representational system and that this preference is revealed through the use of predicates (metaphors). NLP attempts to identify the PRS of individuals for three primary reasons. First, by matching predicates, a client will feel more empathy from the therapist. Second, by matching predicates, a client will better understand the content of the therapist's communications. Finally, by mismatching predicates, a therapist can expand a client's limiting representational system . . . (Mattar, 1980 pp. 29-39).

Grinder and Bandler (1976) state that a person's PRS is detectable by a variety of manifestations. They suggest observing the direction of a person's eye movements during cognitive processing of experiences and information and listening to the predicates which a person uses to describe his/her experience.

Despite their claim that ". . . NLP was developed initially through the systematic study of Virginia Satir, Milton H. Erickson, and other therapeutic 'wizards'" (Bandler & Grinder, 1979, p. 3), "Bandler and Grinder spurn experimental tests of their techniques on the grounds that NLP is a working model and not a formal theory with hypotheses that can be tested" (Goleman, 1979, p. 78).

Mattar (1980) and Dowd and Pety (1982) note that very little research has been reported to either support of refute both the therapeutic effectiveness or the theoretical basis of NLP. Yet despite this lack of empirical evidence, NLP continues to grow. The Structure of Magic volumes have been succeeded by numerous other NLP books, and workshops are offered in nearly every major city across the United States.

Four published articles and four unpublished theses and dissertations that have undertaken to formulate and test hypotheses derived from NLP are reviewed in this dissertation. The present study, like those of Leffel (1977), Owens (1977), Shaw (1977), Thomason, Arbuckle and Cady (1980), Mattar (1980), Falzett (1981), Dowd and Pety (1982), and Gumm, Walker, and Day (1982), represents an attempt to formulate hypotheses from the NLP model and test them.

## Significance of the Study

The significance of this study extends from the fact that although NLP is gaining ever increasing popularity as a method of psychotherapy, neither its theoretical basis nor its pragmatic effectiveness have yet to be substantiated. Only minimal support for the PRS concept has been found and no objective support for the successful employment of NLP techniques in psychotherapy has been reported.

The need for systematic investigation of NLP both at the theoretical and practical levels is clear. This study represents an attempt to investigate theoretical aspects of the PRS concept. The responses of subjects to sensory suggestions given in the context of specific sensory representational systems (predicates) are compared with the subjects' use of sensory predicates in essays describing their experience of responding to the suggestions. Based on the PRS concept, subjects should respond differentially to A, V, and K suggestions and likewise articulate their experience of the

different sensory suggestions with a preponderance of those sensory predicates consistent with their PRS.

This study proposes to extend and refine the methodology of investigations described in the literature review. This will be accomplished by significantly changing the method of collecting, rating, and counting predicates used in previous studies to assess the PRS of subjects. These changes allow greater scrutiny of the predicates produced by subjects and greater control on the rating procedure used to assess predicate production of subjects. Rather than categorizing subjects into discrete PRS categories, this study's methodology will allow profiling subjects based on their relative use of predicates. This way of viewing predicate useage prevents the regarding of a subject as having a K PRS when his use of K predicates is only slightly greater than his use of A predicates.

In addition, this study actively involves subjects in a task (i.e. responding to suggestions) rather than passively listening to an audio-taped dialogue. Further, an instrument, the Sensory Suggestion Scale has been developed that may add to our understanding of the processes involved in fantasy, imagination and suggestability by isolating the sensory input channels of separate suggestions.

Glossary of Terms

The following terms are used in this study:

Representational system - A means of organizing and storing information received from the five senses in order to create an internal map or model of the world (Shaw, 1977). "Ways of representing our experience of the world" (Grinder & Bandler, 1976, p. 6). These representations necessarily differ from the external territory due to the limitation in the nervous system, social constraints and individual constraints (Bandler & Grinder, 1975). These differences from the territory represent the internal map created by the individual which is the representational system (Owens, 1977).

Primary representational system - The representational system the person typically uses to bring information into consciousness; the one typically used to represent internally the person's world and experiences. This system can be identified by listening to the predicates used in the person's natural language (Shaw, 1977).

Predicates - "Verbs, adjectives and adverbs in the sentence which the client uses to describe his experience" (Grinder & Bandler, 1976, p. 9). "The part of a sentence or clause that expresses something about the subject. It regularly consists of a verb and may include objects, modifiers, or complements of the verb. The predicates of the following simple sentences are enclosed in brackets: The house [is white.] The man [hit the dog.]"--the American Heritage Dictionary or the English Language, Houghton

Mifflin Co. Boston: 1976. It should be noted here that Bandler and Grinder's definition of a predicate differs from the dictionary. For example in the sentence above, the noun, "dog" is part of the predicate. Not all adjectives and adverbs are predicates. The essential element of a predicate (phrase) is a verb.

Visual representational system - The way of representing internal experience through the generation of images or pictures (Owens, 1977).

Auditory representational system - The way of representing internal experience through the use of sounds, voices or the creation of internal dialogue (Owens, 1977).

Kinesthetic representational system - The way of representing internal experience through the use of feelings or bodily sensations (Owens, 1977).

Visual predicates - Predicates which presuppose a visual way of representing experience internally. Words such as "see," "view," "look," "picture," "image," "dazzling," are examples of visual predicates (Owens, 1977). See Appendix D for other examples.

Auditory predicates - Predicates which presuppose an auditory way of representing experience internally. Words like "talk," "hear," "ask," "say," are examples of auditory predicates (Owens, 1977). See Appendix D for other examples.

Kinesthetic predicates - Predicates which presuppose a kinesthetic way of representing experience internally. Words such

as "touch," "feel," "grab," "hold," are examples of kinesthetic predicates (Owens, 1977). See Appendix D for other examples.

Meta-model - "A representation of a representation of something" (Bandler & Grinder, 1975, p. 216). An example would be the way language represents experience and transformational grammar represents language. Transformational grammar is, therefore a meta-model (Owens, 1977).

Visual subjects - Those subjects who have been identified in a study as having a visual primary representational system. Usually this is done on the basis of a predicate counting strategy, although in some studies eye movements are the basis for the classification.

Auditory subjects - Those subjects who have been identified in a study as having an auditory primary representational system. Usually this is done on the basis of a predicate counting strategy, although some studies use eye movements for the classification.

Kinesthetic subjects - Those subjects who have been identified in a study as having a kinesthetic primary representational system. Usually this is done on the basis of a predicate counting strategy, although some studies use eye movements for the classification.

Non-specific predicates - Predicates which presuppose neither Auditory, Visual or Kinesthetic representational systems.

Thought predicates - Predicates which presuppose a fourth category of representing experience, that is neither auditory, visual or kinesthetic, but rather an abstract cognitive nature. Words such as "think," "understand," and "believe".

Non-codeable predicates - Predicates which presuppose none of the other categories.

## Hypotheses

There are several hypotheses to be tested by the design of this study. Most central to the theme of this study is the attempt to focus on the PRS model of Bandler and Grinder (1975) and Grinder and Bandler (1976). In this study the author will examine the tendency for subjects to demonstrate some consistency in their response to specific sensory suggestions and their production of specific sensory predicates.

Because tallying predicates has been the standard means of classifying PRS in the previously described studies (Leffel, 1977; Owens, 1977; Mattar, 1980; Gumm et al, 1982) this study will predict responses to suggestions (the dependent variable) from predicate production (the independent variable) despite the fact that chronologically, the data will be collected in the reverse order (i.e. subjects will actually listen to the suggestion scale, self-score their response, then write an essay from which predicates will be counted).

Finally, because the use of K predicates and experiences in hypnotic and suggestability scales, a predication is made that K predicate usage is a predictor of suggestability in general. The following hypothetical statements are offered:

1. Responses to kinesthetic suggestions will correlate higher with the production of kinesthetic predicates than with auditory, visual or thought predicates.

2. Responses to auditory suggestions will correlate higher with the production of auditory predicates than with kinesthetic, visual or thought predicates.

3. Responses to visual suggestions will correlate higher with the production of visual predicates than with auditory, kinesthetic or thought predicates.

4. Responses to suggestions in general (total score) will correlate higher with the production of kinesthetic predicates than with auditory, visual or thought predicates.

Assumptions

In order to study the PRS concept of NLP, it is necessary to assume the existence of cognitive representation and further that it can be categorized as corresponding to sensory input channels. Although their is some evidence for a fourth mode of cognition, i.e., an abstract mode indicated by the use of thought word predicates, no hypotheses based on this mode are to be tested in this study. The notion of a Primary Representational System is accepted only in so far as a preference for one type of sensory predicate or a more intense response to suggestions of a specific sensory nature lends support to the PRS concept.

In this study it was decided to use a written essay obtained from the subjects during the research session. Procedures were enacted to make this written sample as much like a verbal sample as possible, however it must be assumed in this study that written and verbal samples are comparable. The procedure used is discussed in the methods section of this report.

It was assumed that the scoring system used in this study for rating predicates, although different in some significant ways from

the Bandler and Grinder method and those of previously reported studies, did not bias the rating of a subject's use of sensory predicates. This rating system, described in the methods section relied on a dictionary description of a predicate, rather than Bandler and Grinder's less exact description (see Glossary of Terms).

It was assumed that responding to suggestion such as the ones used in this study are analogous situations to the ones Bandler and Grinder claim their model applies.

It is assumed that subjects who participated in this study were representative of undergraduate students taking introductory psychology at Utah State University in 1982.

It was assumed that raters used in this study were, as native speakers of English and as persons employed as clerical staff members of an academic department at Utah State University, adequately skilled in understanding the rules for assessing the sensory nature of predicates as described by Bandler and Grinder.

## Limitations

The results of this study can only be generalized to populations similar to that from which this sample was drawn.

The methodology of this study is unique when compared to previously reported similar research and therefore it cannot be considered a replication of other studies. There were no controls for the handedness, culture, or native language. Information as to

the age, sex, college major, and class standing was gathered but is not intended for use as a separate set of hypotheses.

# CHAPTER II

## LITERATURE REVIEW

In this chapter a selected review of the literature pertinent to this study is presented. In previous doctoral dissertations (Shaw 1977, Owens, 1977 & Mattar, 1980), considerable effort was expended in presenting the literature that appeared prior to Bandler and Grinder's initial volumes. At that time there were no published articles and Mattar cites only the thesis done by Leffel (1977). This review will only briefly cover the literature described in these author's dissertations and focus mainly on the research directly related to NLP that has appeared since 1976.

### Philosophical Foundations

A major foundation of the NLP model is taken from Vaihinger's (1935) work The Philosophy of 'As If'. He defined a cognitive model where the individual created artificial classifications by which external reality is reconstructed internally. In a similar fashion Korzybski (1933) discussed a structure by which language serves as the guide by which the individual understands his world. He noted:

> If words are not things, or maps are not actual territory, then, obviously, the only possible link between the objective world and the linguistic world is found in structure, and structure alone. The only usefulness of a map or a language depends on the similarity of structure between the empirical world and the map-language. (p. 61)

Korzybski's content was that reality is represented in words, and that words are not themselves what they represent. The concept of a

cognitive map is a main feature of NLP. Cognition is not reality just as the map is not the territory. It is here that the gestalt psychology perspective is woven through NLP. Individual perception involves pulling together stimuli from the senses into a meaningful whole. The organization of this meaningful whole occurs spontaneously and is itself more than the sum of its individual parts.

Shaw (1977) notes that from the work Korzybski and Vaihinger, Bandler and Grinder have created their meta-model based on the following concepts:

1. People use mental constructs, or language, in order to construct an instrument or map to guide them through the real or empirical world.

2. The instruments or maps thus developed are not reality; they are merely representations or copies of the real or empirical world.

3. Since the instruments or maps are not reality, but merely representation or copies of the empirical world, the structure of the map may be dissimilar to the structure of the real or empirical world.

4. Whenever the structure of the instruments or maps is not similar to the structure of the real or empirical world, the maps are no longer useful guides and can lead people into making faulty decisions or choices. (p. 19)

## Concepts Derived from Psychotheraputic Models

NLP was the result of Bandler and Grinder's systematic observations of several well-known and well-respected practitioners of psychotherapy. Additionally many therapists and authors who were not studied directly provided creative stimulation for Bandler and

Grinder's model. The list includes Fritz Perls, Virginia Satir, Gregory Bateson, Jay Haley, Paul Wazlawick, John Weakland, Donald Jackson, and Milton Erickson (Shaw, 1977). Grinder himself was trained as a Gestalt Therapist and has collaborated on a book with Bandler and Virginia Satir.

Shaw (1977) finds a unifying premise in the work of Bandler and Grinder and those from whom they have derived their model. It is "that people often experienced pain and frustration in their lives because their perceptions were faulty, limited or distorted" (p. 20). Shaw described the specific contribution of Bateson, Perls and Satir and notes how Bandler and Grinder have borrowed from the thinking and techniques of all these authors as they developed their meta-model. "In all cases, the application of technique was made more explicit and specific by including the representational system concept in the application of technique" (p. 31).

## Neurological Foundations

Bandler and Grinder claim some support for their model from the neurological findings of the "split-brain" research done by Gazzaniga, Sperry and others. That part of this line of research that is relevant to NLP was reviewed by Shaw (1977) and Owens (1977). These very unusual patients had their corpus callosum surgically severed. Although able to survive and function remarkably well, some were observed performing apparently paradoxical acts such as attacking their spouse with the left hand while defending her with the right hand (Gazzaniga, 1967). Sperry

(1964) noted that the two sides of these patients also would cooperate as well or compete. Bandler and Grinder include these findings as support for their theory in that they demonstrate that different hemispheres receive different and sometimes paradoxical information. Grinder and Bandler (1976) specify that eye movements are especially dependent on "normal cerebral organization" that is, right-handedness. This is based on the high probability of right-handed persons being left hemisphere dominant for language. It is for this reason that many of the studies, reviewed later in this chapter, have limited their subjects to right-handed persons.

In summary, the neurological basis for the NLP model is founded on research done on neurologically atypical persons who were surgically altered. It has been presented much more briefly here than in Owens (1977) or Shaw (1977) and the reader is directed there for further information. It bears most directly on the eye movement method of detecting PRS. One study by Thomason et al (1980) has observed eye movements during cognitive processing and was unable to support the Bandler and Grinder model.

## Research on NLP

In this section of the literature review, recent research (since 1977) will be discussed. Included will be four published articles, three doctoral dissertations, and a senior undergraduate honors thesis. At the time this research project was originally proposed, only one dissertation and the senior honors thesis were available. Despite the dates of these research projects, in some

instances previously run studies were not acknowledged and apparently the existence of these other similar studies was unknown.

The unpublished thesis and dissertations all preceded the published articles. Leffel (1977), Owens (1977), Shaw (1977) and Mattar (1980) all investigated PRS and have yet to publish their findings. Thomason et al (1980), Falzett (1981), Dowd and Pety (1982), and Gumm, Walker and Day (1982) have published brief articles on PRS and all but Thomason et al's articles dealt with strategies for assessing PRS by means other than eye movements alone. Thomason et al. (1980) observed their subjects' eye movements while they answered questions consistent with A, V, or K information processing and found that only about 30% of the time did eye movements correlate with their expectations based on the content of the questions. In their study, eye movements were recorded on video tape and viewed by judges blind to the types of questions asked. The questions were designed to make subjects cognitively process either A, V, or K information. Eye movements were rated for eight different positions--the six positions that Bandler and Grinder mention plus straight ahead and unfocused. In their study, Thomason et al made no statement about and presumably collected no data on predicate production.

Owens and Shaw were doctoral students at Ball State University and both attended a workshop on NLP presented by Richard Bandler and Judith Delozier in 1977. Owens (1977) used eye movements, predicate production and self report as three measures for assessing PRS of

his subjects then correlated his data in hopes of finding agreement between these assessment techniques. He generated three hypotheses that tested agreement between pairs of methods and a fourth hypothesis that tested agreement between all three methods of PRS assessment. Only one hypothesis, the comparison between predicate production and eye movements withstood the test. This result was challenged by Gumm, Walker and Day (1982) who replicated Owens' study, got similar results and found errors in Owens' data analysis. Gumm et al. (1982) will be discussed in detail later in this section.

Owens (1977) used right handed undergraduates who had never suffered head trauma. He developed nine stimulus cues in the form of questions that were intended to stimulate cognitive processing. Six questions did not require answers and were used to elicit eye movements alone. The remaining three questions required answers from the subjects. It was from these last three questions that eye movements were noted and verbalizations were recorded. After completion of those parts of the study, subjects were asked to rank order their use of creating images, using sounds, and sensing feelings as methods of cognitive processing. This produced their PRS by the "self-report" measure. Subjects were allowed to assign equal usage of any of the three methods to any rank except first. Hence, a forced-choice for assessing the primary rank was employed.

Owens (1977) classified his subjects PRS using the eye movement measure by training raters to observe eye movements both prior to

and during verbalizations. Eye movements were tallied and the category with the highest frequency of eye movements was accepted as the PRS of that subject based on the eye movement assessment technique.

Owens' (1977) criteria for determing the PRS of his subjects by the predicate tallying method was based on Grinder and Bandler's (1976) descriptions of A, V, and K predicates. A fourth category of unspecified predicates was disregarded because of their idiosyncratic nature, i.e., they mean different things to different people. Raters listened to tapes of subject verbalizations and tallied the occurrence of A, V, and K predicates. Once tallied, the category of predicates with the highest frequency count became the PRS classification for that subject by the "verbalization" method. The situations dealt with in the stimilus cases were all interpersonal in nature.

Perhaps the most interesting result of Owens' (1977) study was that no subjects were classified as having a visual PRS using the predicate tallying technique. This is in spite of a large (128) number of subjects. He explains only one limiting factor in his rating technique where some subjects may have prefaced a rated verbalization by saying "Let's see". This verbalization for some reason was not rated.

Shaw (1977) used Owens' subjects and accepted his classification of the PRS of these subjects. Because Owens found no V subjects based on predicate production, Shaw used only A and K

subjects as determined by the predicate tallying method. Her study tested the recall of A, V, and K material from a script read by a female graduate student. This monologue was presented via the playing of an audio/video tape recording on a television set.

Three forms of the story were constructed, each one counterbalancing the presentation of items described using A, V, and K predicates. Following presentation of the stimulus, subjects were asked to write down all they remembered. Raters tallied the number of items recalled.

Shaw (1977) hypothesized that subjects could recall more items presented in their PRS than items presented in other representational systems. Her null hypotheses all failed to be rejected. They were:

Ho 1 There was no significant difference between the number of A and K items recalled by A subjects.

Ho 2 There was not significant difference between the number of A and K items recalled by K subjects.

Ho 3 There was no significant difference between the number of visual items recalled by A subjects and the number of visual items recalled by K subjects.

Ho 4 There was no significant difference between the number of A, V, and K items recalled by A and K subjects.

Shaw (1977) then attempted a series of seven post hoc analyses of her recall data. She developed a less stringent criteria for

recall that used the number of words recalled rather than the item itself. In other words, if a subject described a single item using 15 words under the original criteria this was counted as one item. Under the less stringent criteria, each word recalled that was used in the script was scored. Thus inflating the range of scores possible. Additionally, Shaw used Owens' (1977) eye movement classification of PRS, and self-report classification of PRS to predict differential recall by both the more and less stringent criteria. None of these post hoc hypotheses reached significance at the .05 level. Interestingly, Shaw reported 2 post hoc hypotheses that did show significance at the .02 level. A finding that is unexplained by Shaw and not understood by this author. Despite her extensive analysis of the data, Shaw was unable to find any support for the PRS concept.

Leffel (1977) hypothesized that when allowed to introspect about and articulate their experience of a particular event while in a state of uncertainty, subjects will demonstrate a "preference" for one of the three representational systems. Two students, one a subject and the other a confederate, listened to taped instructions asking the subject to describe a relationship with a friend. The confederate was pre-instructed to interrupt the subject and ask for clarification or explanation of the subject's description. This was intended to introduce uncertainty without biasing the subject's responses and to encourage the subject's use of metaphoric responses. By tallying the subject's use of A, V, and K predicates,

Leffel found that 19 of his 35 subjects showed a preference for the use of a single sensory mode. Eleven subjects showed no preference, and five showed mixed preferences. Eight were auditory, three visual, and eight were kinesthetic.

Mattar (1980) used a modified version of Leffel's technique for categorizing subjects' PRS. Subjects listened to the taped instructions and verbalized their response into a tape recorder while the experimenter was present. No interruptions by a confederate or the experimenter were described. Interestingly enough, no subjects were found to demonstrate an A PRS (i.e. used a preponderance of A predicates to describe their experience) despite the recruitment of a number of speech pathology students; hence, the design was modified to test differences between V and K subjects only. A stimulus tape was constructed by rewriting a transcript of a therapy session into V and K versions (by using predominantly V or K predicates) and recording it on audio tape with the help of another graduate student. The dependent measure was constructed by making up questions based on the taped stimulus. Half the questions were general information and the others were specific predicate usage questions.

It was hypothesized that subjects would, regardless of their PRS, comprehend general information about the taped therapy session, that is, V and K groups would score equally on those items. Differences were expected between V and K subjects' comprehension of

V and K taped therapy sessions in regard to specific predicate usage.

Mattar's data indicated that V and K groups did not differ in their overall comprehension of V and K taped therapy sessions. When comprehension was divided into general and specific predicate usage, an interaction effect was noted at different levels of groups, test and type of comprehension. Most importantly, each group comprehended questions about specific information phrased in the representational system consistent with their PRS. The hypothesis that comprehension would be enhanced by a predicate matching strategy was only partially supported.

Leffel (1977) stated that his results lend some support to the thesis of NLP in regard to the PRS aspect of the model by establishing that some subjects will demonstrate a preference for A, V, or K predicates. However, since no other predicates (besides A, V, or K) were counted, the extent to which this preference is demonstrated is unclear. His subjects may have used predominantly non-sensory predicates. Since Mattar's study used a similar design, the same criticism might be applied there also.

The PRS of the judges was not considered in either Leffel's (1977) or Mattar's (1980) study, and according to Mattar's thesis, this should affect comprehension of specific predicate usage. In both cases the data elicited from subjects was on tape and was assessed auditorilly by the judges. Had transcripts of the data been made or had the subjects written their response, these biases

might have been minimized by closer scrutiny of the subjects' behavior.

Mattar, at Leffel's suggestion, and in an attempt to get closer to the deep structure (true meaning) of the subject's words, instructed his judges to discard "frozen tropes." Frozen tropes were defined as colloquial expressions such as "that's heavy" which have lost their connection with their original denotated meaning. This researcher finds Mattar's rationale difficult in both theory and practice. Deciding which tropes are frozen and which are not, presented a problem that was solved arbitrarily. Mattar makes no mention as to how many frozen tropes were discarded by his judges. Further, an individual's choice of words may be subject to a variety of internal conditions that are not known to an outsider. The expression, "that's heavy" is kinesthetic in Bandler and Grinder's terms whether one considers its literal or connotative meaning.

Falzett (1981) asked female subjects to either think of certain things or remember certain events during a structured interview. This was expected to elicit eye movements that would betray the sensory modality subjects were using to process the information required to complete the task. The interview was then interrupted while the interviewer and an observer conferred and classified the PRS of the subject as either A, V, or K. When the interview continued, the interviewer either matched or mismatched his predicates to the PRS of the subject. It is important to note here that the subjects were classified as having either an A, V, or K PRS

based on their eye movement response, not on their predicate production. Falzett mentions that predicate productions were counted and that all but three of his 26 subjects produced primarily K predicates. Falzett concluded that eye movements were a better predictor of PRS than predicate production despite Thomason et al's (1980) results that showed very little correlation between expected and actual eye movements in response to a task designed to encourage specific sensory mode processing (Falzett did not reference Thomason's study). The tasks used by Leffel (1977), Mattar (1980) and Falzett (1981) all appear to be biased in a K direction. Leffel and Mattar asked subjects to describe their relationship with a good friend, and Falzett asked his subjects to recall, among other things, the last time they were comfortable, a pleasant childhood experience, and the last time they touched something they really enjoyed.

Dowd and Pety's (1982) subjects were 84 undergraduates (60% female) in four different classes. Their study was conducted during a regular class period and students were given the option to refuse. They a used tape recording of a contrived counseling interview with a female client who had difficulty building relationships. There were two forms of the scripts and each form was presented with a male and a female counselor--hence, four different taped interviews. There were 44 client statements, 24 had sensory (A, V, and K predicates) and 20 used neutral predicates. No breakdown of the percentage of A, V, and K predicates was reported. In one form of

the taped interview, the therapist matched the representational system used by the client. In the other, client predicates were mismatched. When the client spoke in non-specific predicates, the therapist responded in likewise non-specific predicates. The actors who recorded the tapes were blind to the purpose of the study.

Prior to beginning the session, subjects were asked to rate their willingness to see a counselor about a personal problem. Then, the taped interview was played. After hearing a version of the interview, subjects rated themselves on two measures (The dependent variables). The first, was the Counselor Rating Form (CRF) social influence dimensions (La Crosse & Barak, 1976). This part of the CRF measures three variables recognized as important in therapists: attractiveness, expertness and trustworthiness. The second measure was the Counselor Evaluation Inventory (Linden, Stone, and Shertzer, 1965) which purports to measure counselor comfort, client satisfaction and counseling climate.

Because a one way ANOVA showed a significant difference in subject group willingness to see a counselor (prior to listening to the tape) an analysis of covariance was used (prior willingness used as the co-variable). The sex of the counselor had a significant effect on post-interview willingness to see a counselor. The 2 x 2 design (sex of counselor x matching/mismatching condition) yielded no significant effects on either the CRF scales or the CEI, and no significant two-way interaction.

Gumm, et al. (1982) essentially replicated Owens (1977) dissertation. They used 50 right-handed female undergraduate students and collected data on eye movements, self-report, and verbalizations (for predicate tallies) to assess PRS in individual 45 minute research sessions.

Subjects were told to speak for about a minute on each of 5 questions presented in random order, these were tape recorded for later scoring. A more complicated self-report measure was employed. This allowed subjects to rate in varying degrees their use of A, V, and K cognitive processing of 24 items (8A, 8K, and 8V). This was adapted from the Cognitive Style Mapping Inventory (Hill & Nuney, 1976).

Subjects' eye movements were videotaped through a one way mirror while their heads were restrained. The room was specially prepared to eliminate distractions and eye movements were recorded during and after subjects were presented with 20 tasks designed to elicit cognitive processing. Gumm et al (1982) reported agreement on 76% of 1000 eye movements judged by their raters. One should bear in mind that six movements were scored - 3 are auditory, 2 are visual and 1 is kinesthetic.

Gumm et al's (1982) raters used Owens' (1977) predicate tallying method. The number of predicates detected was not recorded but both raters found numerous instances of difficulty discriminating between two modalities based on frequency counts.

Gumm et al found no significant correlations between any pairs of PRS classification methods. They reported similar breakdowns of PRS classifications based on verbalizations (predicate tallying method), eye movements, and self-report between their study and that of Owens (1977). Unlike Owens, Gumm et al did not find a significant relationship between eye movement-based classification of PRS and predicate tally-based PRS classifications. This is despite the use of similar measuring techniques and identical statistical analysis. Further, Gumm et al (1982) analyzed Owens' (1977) data and found no significant results.

## Predicate Production as a Means of Classifying PRS

Despite the similar nature and designs of Owens' (1977) and Shaw's (1977) dissertations, Mattar (1980) was apparently unaware of their work. His study relied heavily on Leffel's (1977) strategy, but was simplified and was brought more in line with Grinder and Bandler's (1976) description of how to assess PRS.

Owens (1977) and Leffel (1977) used similar methods for assessing the PRS of their subjects. Their techniques amounted to asking the subject to speak on some issue, then audio tape-record their response. Judges, trained using excerpts from Grinder and Bandler's Structure of Magic (Vol. II), rated the verbs, adverbs and adjectives as either A, V, or K. The two main differences between the methods used by Owens and Leffel were the stimuli to which

subjects responded and the criteria by which PRS classifications were made after A, V, and K predicate tallies were completed.

Additionally Leffel used a confederate to introduce uncertainty and encourage metaphoric language. This strategy, interestingly enough, counters Bandler and Grinder's model which accepts language as literal. Metaphors are not considered just another way of saying something but rather a literal conveying of one's cognitive experience. In other words, according to Bandler and Grinder if someone says, "I see what you mean," he means he is producing images that correspond with what the other person is talking about. Leffel believed that in some cases, people talk in what might be called metaphorical cliches. He referred to these as "frozen tropes", not counting them in content analyzing language for classifying PRS.

There is a major problem in the direction of the foregoing line of research. There has been an acceptance of the existence of the PRS concept. Subjects were classified and then predictions in terms of other behaviors were made.

Leffel (1977) viewed his research as supporting NLP because some of his subjects demonstrated a preference for a given type of sensory predicate. Others (Owens, 1977 ; Mattar, 1980) saw problems with the predicate counting strategies because none of their subjects were classified as having either an A-PRS or a V-PRS. Falzett (1981) found the overwhelming majority of his subjects used K predicates and concluded that predicate counting was not a good predictor of PRS. Falzett made no mention of the Thomason et al

(1980) finding of negative results with eye movements. All these assume that the distribution of PRS among the population must somehow be equivocal.

In order to reach these kinds of conclusions, a tacit acceptance of the PRS concept is assumed. Despite the dirth of negative findings this assumption itself has been challenged by Gumm et al (1982). The criteria used for comparing one assessment technique against another have been eye movements, self-report and predicate production.

Shaw (1977) points out that a problem may exist in using a normal college population. Grinder and Bandler (1976) based their work and model on persons engaged in psychotherapy and that population may be quite different in their PRS or production of predicates. Unfortunately, Grinder and Bandler present no data on the occurrence of PRS in their population. Interestingly enough, Owens reported that in the Bandler and Delozier workshop that Shaw and he attended in 1977, it was stated that American culture favors the development of V-PRS. This stands in conflict with Owens' (1977) finding of no V subjects as determined by his predicate counting technique. Likewise Mattar (1980) found no A-PRS subjects despite a special recruitment of speed pathology majors into his subject pool.

In all the previously described studies predicates were categorized and tallied from tape recordings. This presents a problem heretofore not dealt with by any of the researchers in this

field. Several of these studies have accepted the notion of PRS and undertaken to assess it and then compared subjects on various tasks, that according to theory, should produce differential responses.

The rating of predicates is based on similar training materials (excerpts from Grinder and Bandler, 1976) and the raters decided which subjects have which PRS. The criteria were variable. Mattar (1980) used tallies where at least 51% of sensory predicates were of one modality. Leffel (1977) used a statistical test to determine if proportionate use of A, V, and K predicates was significantly (P=.10) different. Owens (1977) and Shaw (1977) used a simple "most frequently used type of predicate" to classify the PRS of their subjects. They noted that in many instances predicate tallies were very close.

Many of the hypotheses generated by these PRS researchers (Shaw, 1977; Mattar, 1980; Falzett, 1981) propose differences in the receptivity, recall, and comprehension of information presented in a specific representational system to subjects based on their PRS. According to their hypotheses, one would expect some amount of differential rating by judges due to their PRS (who were assigned to listen to audio tapes and classify subjects by PRS based on their production of predicates). One does not expect judges to completely not attend to sensory predicates of a represented system that is not their PRS, but one might expect a tendency to misrepresent or overlook. Some control could be exercised here by transcribing audio tapes and specifying predicates to be scored. This would

decrease two major sources of error in predicate tallying. Knowing what words to rate would facilitate greater concordance between raters and also allow a means of turning a very subjective rating procedure into a more objective one.

This study proposed a way of looking for a consistency in the processing of information in a preferred sensory mode. The question here is not whether we experience and subsequently process information using sensory channels. That proposition is accepted based on introspection of one's own cognitive experience. What is of question here is the notion of a preferred sensory mode of cognition; and, does some degree of consistency exist between a person's preference for one channel in terms of both expression and reception? Personal preference for a particular sensory channel, demonstrated by verbal behavior or some other expressive method such as eye movement, has been addressed by the previously mentioned studies (Leffel, 1977; Owens, 1977; Mattar, 1980; Falzett, 1981; & Gumm et al, 1982). These authors (except for Gumm et al), and Bandler and Grinder, have assumed that output communications (i.e. predicate usage and eye movements) are measures of internal processing and even receptivity. If people have a preferred sensory mode (PRS), then they should demonstrate increased responsivity to information presented in that sensory mode, and their verbal behavior (i.e. predicate production) should also reflect that preference. It is this foregoing proposition that is the focus of this study.

Summary

This chapter contains a brief review of the Philosophical and Neurological foundations of NLP. The dissertations of Owens (1977), Shaw (1977) and Mattar (1980) have concentrated much more heavily on these foundations of NLP and the reader is encouraged to read those author's works for a more detailed account. Leffel, Owens, Shaw and Mattar were each doing initial research in the field of Representational Systems. Since then four articles have been published on NLP, three of which have focused on predicate production as a means of assessing the PRS of subjects. Each researcher attempted to classify subjects' PRS based on their predicate productions using similar methods. One found no A subjects and another found no visual subjects. Four studies investigated the relationship between three methods of assessing PRS, (i.e. eye movements, predicate counting, or self-report). The methods of assessing PRS are subjective; and in this regard they closely adhere to the method suggested by Bandler and Grinder. Two studies hypothesized differential responses by subjects on tasks such as recall and comprehension, based on differential receptivity to A, V, and K worded stimuli. Two studies looked at the effects of predicate matching. Eye movements were studied both live and using video tapes.

Only two studies have yielded unchallenged positive results. Mattar (1980) found that subjects classified as V and K based on predicate counts made less mistakes on comprehension test items

worded in specific predicates consistent with their own PRS. Falzett (1981) found that after assessing PRS by observing eye movements, matching predicates to PRS increased trust ratings. Falzett reported that 23 of 26 subjects used a preponderance of K predicates. One would assume that his experimenters mis-matched their predicates to the subjects' predicates in order to match their predicates to the subject's PRS (as determined by eye movements). No agreement as to the distribution of PRS by predicate counting was found. Mattar found no A, Owens found no V and Falzett found all but three of his subjects to be K.

A generally credulous view of NLP and the PRS concept was exhibited by the researchers with the exception of two authors. Gumm et al (1982), after discussing the inconsistency of results of these studies, brought to question the veridicality of the theory of NLP and the application of its' principles in a counseling setting. Thomasen et al (1980) recorded eye movements during a session where subjects were asked questions that required cognitive processing and found only 30% agreement between actual and expected eye movements.

Predicate counting, the strategy used in this study was discussed and controls on procedures were suggested with the goal of developing a more objective assessment of predicate usage.

# CHAPTER III

# METHODOLOGY

This chapter contains all the information necessary to replicate this investigation. In it are described: the manner in which the Sensory Suggestion Scale and its Self-Scoring Form were developed; the reasoning behind and the procedures followed for scoring the subject's essays; the training of predicate raters, the selection and description of subjects; a description of the procedure and data collection, and the coding and analysis of the data.

## Pilot Studies

Two pilot studies were run in order to devise the instruments and scoring strategies used in this study. In both pilot studies the instructions and suggestions were presented via an audio tape recording.

The first pilot study used Barber and Wilson's Creative Imagination Scale (CIS) and Self-Scoring Form (1978/79), and a modification of Mattar's (1980) method of eliciting written samples from subjects from which to count predicates. Because of the preponderance of K suggestion in the CIS, two items were added that were A and V in content. On the basis of this pilot study, it was decided that the CIS, though mostly K in content, offered suggestions with enough A, V, and K predicates that a confounding of the separate effects of A, V, and K predicates was likely.

Suggestions in the CIS, like other similar scales, did not present discreet A, V, or K suggestions. It was also found that all subjects demonstrated a preference for K predicates when describing their relationship with a friend. It was believed that the nature of the task might have biased responses in a K direction. Because of this, a second pilot study that contained a different task was run.

The second pilot study used an imagination scale constructed by this researcher. Some items used were based on suggestions from other scales that were rewritten to make them more exclusively A, V, or K. Other items were original constructions of the author. The resulting scale contained brief instructions for the subject to close his eyes and make him/herself comfortable; then eight suggestions were given. The scale included two A, two V, two K, and two M (mixed: A, V, and K) suggestions. Subjects filled out the Self-Scoring Form. Then, to obtain a written sample, subjects were asked to write a short essay describing their experience in the previous part of the session when the suggestions were presented.

Nine subjects responded to the items on the scale. They showed some dispersion of scores in responses to all suggestions. V and M suggestions elicited the strongest responses. A suggestions had the weakest responses. The self-scoring form was altered (for its final version) to render scores that would allow more useful responses. Questions regarding the M suggestions were reworded to assess the subject's response to the A, V, and K components of the (total) M

suggestion. This final version is described later in this section. All subjects in the pilot study demonstrated a preference for K predicates on the written task. This preference for K predicates by subjects in both pilot studies raises some questions. It could be argued that the number of words available to subjects in the English language happen to favor K predicates. The possibility that this bias affects subjects' verbal behavior is countered by Cole & Scribner in regard to the theme of lexical differences:

> The Hopi use a single word to name all flying objects. . . On the other hand, the Eskimos have many different words for snow. . . while we get along with one. . . What is the significance of these differences? Does the fact that a language does not have separate terms for certain phenomena mean that users of this language are unable to distinguish these phenomena from others? Are Americans unable to see the differences that the Eskimos see in snow? Or, to take an example that seems absurd on the face of it, is the Hopi unable to make a visual distinction between an aviator and an insect? (Cole & Scribner, 1974, p. 43).

In order to allow hypothesis testing by more than only two responses, the two items on the Self-Scoring Form regarding the two mixed responses have been expanded to three questions for each suggestion. Each question allows subjects to rate the strength of their response to the specific sensory aspects of each suggestion. These six questions are phrased in the same format as the questions assessing the other A, V, or K suggestions. There are four questions assessing each specific sensory suggestion type and these will provide the dependent variables for the study.

Written samples based on a subject's experience with a recent multi-sensory event offer some control on the input side of the

experience. Thus the K-bias of the stimuli used by Owens (1977), Mattar (1980), Falzett (1981) and Gumm et al (1982) is not present in this study.

The Use of Sensory Suggestions

According to Bandler and Grinder's model, a subject's response to suggestions presented in their PRS should be greater than that of subjects who receive suggestions worded in the language of a non-preferred representational system. This view is supported by researchers (Hoijer, 1964; Whorf, 1964) who found that tasks requested of subjects which involved unfamiliar words were more difficult to perform. If suggestions are presented in different representational systems to a large group of subjects containing individuals with different PRSs, some differences in responding to the different suggestion should be observable.

In the original conceptualization of this study of the relationship between response to suggestions and the use of sensory predicates, it was thought that the best dependent variable would be an already existing suggestability scale. After content analysis of several of these scales it became apparent, that although the main focus of several items was either A, V, or K, none of these scales offered "pure" sensory suggestions.

By scanning the wording of various suggestibility scales (Weitzenhoffer & Hilgard, 1959; Shor & Orne, 1962; Barber & Wilson, 1979/79), it became apparent that they were constructed primarily in a K representational system. A typical suggestion would begin with

a description of the task using T predicates and a suggestion starting with the use of V predicates, then as the script proceeds, K predicates are introduced with increasing frequency. This tendency to move towards K predicates was perhaps guided by the understanding that suggestibility and related tasks of fantasy and imagination are inward (K) experiences. Based on this use of K predicates by the authors of the various suggestibility scales, it should follow that subjects who demonstrate a preference for K predicates should respond better to K suggestions than subjects who demonstrate a paucity for K predicates. It was on this rationale that the fourth hypothesis was based.

The Sensory Suggestion Scale and Self-Scoring Form

In order to test the first three hypotheses it was necessary to construct a suggestability scale that presented sensory suggestions that were "purely" worded in specific representational systems. The topics were based largely on suggestions used in other suggestability scales and all are commonly experienced phenomena. The scale was made up of eight suggestions: 2A, 2V, 2K, and 2 mixed suggestions that included A, V, and K aspects. The V suggestions entailed imaging an apple and a friend's face; the A suggestions were hearing a telephone ring and favorite piece of music, and the K suggestions dealt with feeling a force moving your hands together and feeling a stream of water pushing your hand and arm up. The mixed suggestions required subjects to image being back in

elementary school and being at a peaceful beach. In both of these mixed suggestions, specific A, V, and K sensory experiences were employed. A transcript of the entire sensory suggestion scale is presented in Appendix B. The separate suggestions in the Sensory Suggestion Scale were rated by the same raters who rated the subject essays. These raters used the same rating procedures that were used in rating the subjects' essays. Results of these ratings are presented in Chapter IV.

The Self-Scoring Form was developed to allow subjects to rate themselves based on their response to the suggestions. It was based largely on the Creative Imagination Scale Self-Scoring Form (Barber & Wilson, 1978/79). This model provides a five point scale where the subject rates his/her response to each item as compared to a similar "real" experience. For example,

1. In the first test you were asked to SEE the image of an apple. Compared to what you would have experienced if you were actually LOOKING at an apple, what you experienced was:

| 0% | 25% | 50% | 75% | 90+% |
|---|---|---|---|---|
| Not at all the same | A little the same | Between a little and much the same | Much the same | Almost exactly the same |

The separate A, V, and K components of the two mixed suggestions were presented as individual items on the Self-Scoring Form. The total number of items on the form equaled 12, including 4A, 4V, and 4K items. Each item has a range of 5 points rendering a total possible score of 20 points for the each composite sensory suggestion type. A subject could score themself as high as 60 for

the entire scale (the lowest possible score being 12). The Self-Scoring Form for the Sensory Suggestion Scale is presented in Appendix C. It should be noted that on the self scoring forms, subject responses are labelled 0-4. In this discussion for the sake of consistency throughout the study the ranges of responses will be discussed as 1-5 for each item.

The Predicate Usage Percentage Score Versus Classifying Subjects' PRS by Predicate Tallies

All the studies that have investigated the PRS concept using predicate production as a basis for subject classification have relied on a similar technique derived from Grinder and Bandler (1976). These studies have been described in the Literature Review (Chapter II). Their authors were concerned with categorizing subjects into discrete categories based on the relative production of A, V, or K predicates collected either orally or on audio tape recordings. These researchers (Leffel, 1977; Owens, 1977; Shaw, 1977; Mattar, 1980; Dowd & Pety, 1982 ; Gumm et al, 1982) were concerned with the use of three specific types of predicates i.e., A, V, and K. The methods of Owens (1977) and Shaw (1977), Leffel (1977) and Mattar (1980) for classifying the PRS of subjects amounted to gathering data by means of taping a subjects verbal response. Trained judges then listened to the tape recordings, tallied the frequency of occurrence of A, V, and K predicates and then classified the PRS of that subject. The degree of difference in these frequency counts differed from one study to the next.

Mattar's criteria was 51% of the total of sensory predicate. Leffel used a more complicated statistical test for a significant difference between frequency counts. Owens and Shaw (both used same subjects) used a simple highest frequency method. They reported instances where subjects with nearly equal frequencies in two categories were classified as belonging to only one category (A, V, or K PRS). These studies all closely followed the Bandler and Grinder method which is not specific about defining how much specific sensory predicate usage qualifies someone for classification in a PRS category.

Owens' (1977) and Shaw's (1977) method permitted placing two subjects with very similar patterns of predicate usage in different PRS categories. Methodologies like Leffel's (1977) and Mattar's (1980) on the other hand, eliminated such subjects for not having a strong enough preference to be classified as having a PRS.

In this study, predicate usage as measured by percentage of use of specific predicate type is the independent variable. This approach concerns itself with predicate usage as the crucial element and avoids grouping subjects by PRS. In a major way this represents a deviation from NLP theory and the PRS model in particular. It is expected that this alteration will permit a direct investigation of the relationship between predicate usage and response to sensory suggestions. NLP's PRS model is tested here if only those subjects with high percentage scores of A, V, and K predicates are compared for differential response patterns to A, V, and K suggestions.

Written vs. Oral Samples

Leffel (1977), Owens (1977), Shaw (1977), Mattar (1980), Falzett (1981), and Gumm et al, (1982) all used oral samples, either live or recorded, for classifying the PRS of subjects. Their method, when compared to collecting written data, is viewed as problematic for a number of reasons: (1) Written responses allow closer scrutiny of the subject's behavior. (2) Transcription costs, for even a brief audio sample of many subjects, are prohibitively expensive. (3) Orally presented samples require judges to make quick decisions which may be biased by the PRS of the judges. Although also possible in a written essay, this bias is minimized by the rater's ability to read at his/her own rate. Another safeguard is employed in this study where the rater's task will be simplified by an editor's circling the words to be scored. (4) Finally, although written language may differ from spoken, it is generally considered that the former is an overlay process of the latter. With appropriate instructions, it is assumed that a written sample will not differ from the taped samples collected in previous studies in any meaningful way.

Expansion of the Predicate Categories

Aside from the A, V, and K predicates described in the Structure of Magic (vol. II), Grinder and Bandler (1976) make mention of a predicate category that is not indicative of a representational system. Words like "think", "imagine", and "understand" do not express an implied representational system.

They may mean one system to one person and another system to someone else. Bandler and Grinder suggest not counting these predicates since their meaning cannot be understood without further information. Crapo[1] suggests that a fourth category, abstract thinking may add to the construct to account for these words. These "think" (T) words do not imply a sensory system of their own, but they do imply the existence of a generally accepted internal process, that is, abstract thinking. Since Bandler and Grinder suggest ignoring T words anyway, the tallying of this extra category will not affect, that is, enhance or diminish the number of A, V, or K words counted. Still another category of predicates is found that would not be tallied elsewhere; these are non-codeable words (N) that imply neither A, V, K, nor T representations. By including T and N predicates in a study, the use of sensory predicates can be compared with the use of nonsensory predicates and a more complete analysis of a subject's verbal behavior can be accomplished.

Rating Predicate Usage

The scoring of subject's useage of predicates is the methodological consideration that most clearly differentiates this study from those which have preceded it. The methodologies of Leffel (1977), Owens (1977), Shaw (1977, Mattar (1980), and Gumm et al (1982) were all derived from the Structure of Magic, (vol. II) (Grinder & Bandler, 1976).

The dictionary definition of a predicate is somewhat different than the one used by Grinder and Bandler (1976).

> Predicate - Grammar: The part of a sentence or clause that expresses something about the subject. It regularly consists of a verb and may include objects, modifiers, or complements of the verb. The predicates of the following simple sentences are enclosed in brackets:
> The house [is white]. The man [hit the dog].
> (American Heritage Dictionary)

Grinder and Bandler define predicates as:

> "words used to describe the portion of a person's experience which correspond to the processes and relationships in that experience. Predicates appear as verbs, adjectives and adverbs in the sentences which a client uses to describe his experience" (p. 9).

During the development of this study's predicate rating scheme, the difference between the Bandler and Grinder definition of a predicate and the dictionary definition of a predicate became apparent. The dictionary version considers a predicate to be a structural element of a sentence or phrase. Bandler and Grinder's definition considers a predicate to be any verb, adjective or adverb.

Because not all adjectives serve as predicate adjectives and some adverbs constitute only part of a predicate and not entire predicates in and of themselves, some modifications to Bandler and Grinder's scoring method were necessary. These modifications were developed by this author and his advisor in this study, Dr. Richley Crapo. They came about during our content analysis of the pilot study data.

In the typical rating method used in the previously described studies (Leffel, 1977; Owens, 1977; Shaw, 1977; Mattar, 1980; Gumm et al, 1982), raters listened to taped samples of subject

verbalizations and counted the occurrence of A, V, and K predicates. One of the concerns in regard to the accuracy of predicate ratings was the subjective nature of this procedure where raters were required to assess which words are predicates, then rate the sensory nature of the predicates. It was possible that some arbitrary selection of which words were to be rated was effecting the classification of subjects' PRS. In order to control this part of the procedure and also to simplify and focus the rater's task to judging only the sensory nature of a word, an editor was assigned the task of circling each predicate that the raters were to later score.

Because of the discrepancy between the conventional (dictionary) definition of a predicate and that of Bandler and Grinder's, the decision was made to have the editor circle the entire predicate. The general guidelines used by the editor are listed below:

1. Include all verbs.
2. In the case of the verb "to be", both the verb and its modifier as a single predicate were circled.
3. Compound verbs, that is, verbs with compound modifiers, were scored as multiple verbs.

Some examples follow:

1. The chair <u>was comfortable</u>.
2. I <u>felt</u> comfortable.
3. It <u>seemed to be bright red</u>.

4. The apple was big and red.

5. The big red apple was very vivid.

In example 1, the verb "to be" cannot stand alone, hence the predicate "was comfortable" is underlined.

In example 2, "felt" is a verb and is scoreable without a modifier. To underline either would probably have the same effect; to underline both separately would lead to an interpretation that two predicates were spoken, that is, twice the amount as in example 1.

In example 3, "It seemed" is underlined as a predicate apart from the verb "to be"; "bright" and "red" are taken as parts of the total predicate "to be bright red".

In the next example, 4, the verb "to be" is compound and taken to mean "the apple was big" and "the apple was red".

In example 5, "big" and "red" modify a noun and were not not underlined . In this structure they are not part of the predicate; they are used as adjectives describing the subject. No verb connects them.

The last example, raises an interesting question. In Bandler and Grinder's first volume of the Structure of Magic, (1975) considerable attention is paid to the deep structure of language. One could assert that any adjective implies a verb or predicate. In deep structure, the sentence: "He viewed the multicolored rainbow" might translate to "He viewed the rainbow" and "The rainbow was multicolored." One could argue that this study's methodology should

have included a deep structure rewriting of the essays. This idea was discarded for two reasons. It would require extensive tampering with the data and perhaps more importantly, cause alterations of unknown proportions in the subject's responses. By eliminating adjectives not directly tied to predicates, some data are lost. This author believes that as long as the rules for selecting predicates are employed systematically, there is no reason to suspect that any particular bias in terms of a specific sensory category is introduced.

After circling all the predicates in a given subject essay, the editor numbered the circled words. This was done to assure that both raters were rating the same predicate and allowed the author to cite discrepencies and compute accurate percentages of predicate usage.

Finally, although previous researchers (Leffel, 1977; Owens, 1977; Shaw, 1977; Mattar, 1980) accepted the PRS concept and set out to find ways of classifying the PRS subjects and in some cases test their performance in various tasks based on their PRS. None of these authors mention the PRS of their raters. This issue could be salient when one considers the hypothesized differential performance of people in the areas of comprehension and recall. In the rating of ongoing oral narration both recall of words and comprehension could well play an important part in determining how likely a rater is to notice a predicate of a representational system that differs from his/her own PRS.

This author maintains that the simplification of the raters tasks to choosing 1 of 5 categories for a circled word or phrase allowed a degree of rigor unmatched in the other more subjective designs. This advantage was gained at the cost of sacrificing the more informal, subjective, but perhaps more clinically analogous situation described by Grinder and Bandler (1976).

The raters were clerical staff members at an academic department at Utah State University. They rated the words and phrases circled and numbered by the editor. Their ratings were made independently and on separate IBM optical scanning forms. They were trained based on the instructions presented in Appendix D. Both were native speakers of English and as secretaries, have demonstrated verbal skills.

Subjects

The subjects were 134 undergraduate students enrolled in a single section of Introductory Psychology at Utah State University in July 1982. One student in the class requested to not participate and was dismissed. Demographic data was collected regarding age, sex, major and class year. None of these are considered as variables in the hypotheses. Students in an introductory class were used to eliminate the potential bias of specialized education on language. The research session was run during a regular class period to minimize the effects of using subjects who volunteered for the study based on some special interest in the topic. Demographic

data gathered during the research session are presented in Chapter IV.

The task was described as involving a test of the student's ability to imagine some things, score themselves on a short questionnaire and then write a brief description of the experience. The Informed Consent and Release of Information form, the Imagination Scale Self-Scoring Form, and blank sheets of paper (for the essay) were serial numbered and stapled together and handed out as packets to the subjects. This made identifying information on the data forms unnecessary and avoided the need for keeping subject names confidential.

The entire research session procedures were presented by the author from a script that is presented in Appendix B.

During the experimental session, subjects were administered the Sensory Suggestion Scale by the author. They then scored their response to the individual items on the supplied Self-Scoring Form and were instructed to write the brief essay describing their experience. The packets were then collected, the purpose of the study was explained, questions regarding the topic in general and the experiment in particular were answered. Subjects were thanked for their participation, notified how they could get in contact with the experimenter for further information regarding the results, and dismissed. The entire session lasted approximately 45 minutes.

The written samples were separated from the Self-Scoring Forms. The written samples were turned over to the editor who was familiar

with both this study and NLP. The editor underlined all predicates in accordance with the procedures described previously in this chapter. Each circled predicate was assigned a number (starting with 1 for the first predicate in each essay, and given to the raters.

The raters were instructed to score only the circled predicates as A, V, K, T or N using the excerpt from Grinder and Bandler (1976) used in Mattar's (1980) study and modified to include T and N categories (for "thought" and "non-codeable" categories).

Unlike the studies of Leffel (1977) and Mattar (1980), two instead of three raters were used. In both of those studies raters tallies were summed. In this study, the design permits an assurance that raters score the same words. This feature of the design allows close scrutiny of the discrepencies between raters. Therefore, only scores where the raters agreed were counted. When the raters scores disagreed the word was scored as an N.

The raters were blind to each other's scoring of the predicates and also to the self-scored responses to the Sensory Suggestion Scale. To study inter-rater reliability, rating discrepencies were recorded and categorized by type. This is described in the following section of this chapter.

## Coding the Data

Responses from the Sensory Suggestion Scale Self-Scoring Form were transcribed onto IBM optical scanning form for computer analysis.

Means and standard deviations were computed for each item (suggestion) on the form and the total score (sum of all items). Responses to the visual items were summed to render a V score; responses to the auditory items were summed to render an A score; and, responses to the K items were summed to render a K score. Means and standard deviations were computed for V, A, K and Total Scores. These scores were the dependent variables in the series of multiple regression analysis.

Disagreements between raters were recorded and categorized by type. A type I discrepency is defined as one where one rater scored a predicate as a "T" and the other scored it as an "N". A type II discrepency was defined as when one rater scored a predicate as a sensory predicate (A, V, or K) and the other rater scored the same predicate as a "T" or "N". Type III discrepencies were defined as instances where the raters both scored the predicate as being different sensory predicates. All discrepencies were rescored as "N" or noncodeables. A breakdown of rater discrepancies is presented in the Results section, Chapter IV.

The predicate usage ratings, now corrected by changing discrepent ratings to the N category were changed to percentage scores. Two computational methods were used. The first computed ratios of using A, V, or K frequencies as the numerator and the total of A, V, K, T and N ratings as the denominator. This rendered a percent of total predicates score.

The second method considered the sum of only A, V, and K predicates in the denominator, thus rendering a percentage of sensory predicates.

The use of these two methods of computing percentage (of total predicates and of sensory predicates) scores allowed two tests of the four hypotheses.

The coded data A, V, K and Total scores of The Sensory Suggestion Scale, and A, V, K percentage of sensory predicates scores are presented in Appendix E.

## Data Analysis

Multiple regression analysis was selected as the appropriate statistical technique for testing the hypotheses. Veldman (1967) gives this description of the technique:

> Multiple correlation may be considered a special case of the more general canonical correlation model, with multiple predictors on one side and a single criterion on the other. The analytic procedure determines a set of weights for the predictor variables which will yield a composite variable that correlates maximally with the criterion variable. Multiple regression analysis may be considered a general model for testing any hypothesis cast in the form of predicting a criterion from particular sources of information. Especially important is the fact that the predictor information may be in the form of dichotomous scores reflecting group membership or may consist of scores as continuously distributed variables. Both kinds of predictor variables can be included in the same equation (p. 299).

A series of multiple regression equations using A, V, K and T percentage scores as predictor variables were computed. In successive equations the criterion variables were scores from the K, A, V items of the Sensory Suggestion Scale. In the fourth equation,

the total scores from the Sensory Suggestion Scale were used as the criterion.

| | Response to Sensory Suggestion | Predicate Usage |
|---|---|---|
| 1. | K suggestion score | A, V, <u>K</u> and T % score |
| 2. | A suggestion score | <u>A</u>, V, K and T % score |
| 3. | V suggestion score | A, <u>V</u>, K and T % score |
| 4. | Total suggestion score | A, V, K and <u>T</u> % score |

--hypothesized best predictors are underlined.

As described in the "Coding the Data" section of this chapter, two types of percentage scores were used as the dependent variables, hence a second correlational analysis was performed. The results of these analyses are presented in Chapter IV.

# CHAPTER IV

# RESULTS

In this chapter the sample pool is described based on their report on the Sensory Suggestion Scale Self-Scoring Form. Data are presented attesting to the "pureness" of the sensory suggestions based on the rater's scoring of the script used in this study. Responses to the Sensory Suggestion Scale as recorded on the Self-Scoring Form are described and rates of predicate usage are presented. Information on Rater discrepencies are discussed and the results of the Multiple Regression are detailed.

## Descriptive Data on the Subject Pool

One hundred and thirty-four subjects took part in this research study. The sixty-seven male and sixty-seven female students with a mean age of 20.23 years were mostly freshmen (69%) and sophomores (18%). Although majors in eight different academic colleges participated, business majors made up the greatest group (19%), Education (16%), Physical Sciences (13%) and Liberal Arts and students with undeclared majors (13%) made up the other large categories.

## Predicate Ratings of Sensory Suggestions

A post hoc content analysis of the sensory suggestions revealed the raters' scoring of the individual sensory suggestions. As was the case with the scoring system used by the raters assessing

predicate usage on the subject's essays, disagreements were converted to "N" (noncodeable) scores. Percentages shown in Table 1, were based on the use of sensory predicates only. Less than 10% of the total predicates scored in the sensory suggestion script were scored as T (Thought) words. Because of the nature (i.e. usage of A, V and K predicates) of the two mixed suggestions, their percentage scores were combined for an overall rating. Although one suggestion (friend's image) rated a percentage score as low as 70%, the overall pureness of the suggestions is apparent.

Table 1

Predicate Usage Ratings of Sensory Suggestions

| Suggestions | A% | V% | K% |
|---|---|---|---|
| Hand Levitation | -- | -- | 100 |
| Telephone Ring | 86 | -- | 14 |
| Apple Image | -- | 83 | 17 |
| Friend's Image | -- | 70 | 30 |
| Music | 100 | -- | -- |
| Moving Hands | -- | -- | 100 |
| Mixed (combined) | 35 | 32 | 32 |

Response to Sensory Suggestions

Table 2 lists means and standard deviation of subjects' responses to the Sensory Suggestion Scale Self-Scoring Form. Subjects responded best to the visual suggestions and least to the

kinesthetic suggestions. Given the opportunity to score themselves as high as five on the individual items, 20 on the combined sensory items and 60 on the total scale, subjects tended to score themselves in the 3-4 range on the individual items of the Self-Scoring Form. This corresponds to the 50% to 75% ratings or, "Between a little and much the same" to "much the same". . . "as compared to an actual experienced" statements. In Appendix E, individual subject scores for the combined A, V, and K items and total scale are presented.

Predicate Usage

From the 134 subject essays analyzed, 3,919 predicates were scored. Subjects produced an average of 29 predicates per essay.

In Appendix E, the relative usage (in percentages) of the three types of sensory predicates for each subject is presented. The high usage of K predicates by most subjects is clear. In comparing the relative usage of A, V, and K predicates in subject essays, the average percentage of K predicate usage was 68%. The average percentage of V and A predicates were 19% and 14% respectively. Where several subjects attained or approached 100% K sensory predicate usage, only the rare subject attained or even approached 50% usage of A or V predicates.

Rater Discrepancies

As mentioned previously (Chapter III) the raters scored numbered, circled predicates. Their responses went directly to scoring sheets and each rater knew neither the scores of the other

Table 2

Self-Scored Responses to the

Sensory Suggestion Scale

| Visual Suggestions | X | S.D. | Auditory Suggestions | X | S.D. | Kinesthetic Suggestions | X | S.D. |
|---|---|---|---|---|---|---|---|---|
| Apple Image | 3.696 | 1.060 | Music | 3.593 | 1.217 | Hand Levitation | 3.667 | 1.287 |
| Friend's Image | 4.185 | .979 | Telephone | 3.185 | 1.217 | Water Stream | 2.689 | 1.318 |
| Age Regression | 3.578 | 1.075 | Age Regression | 2.815 | 1.080 | Age Regression | 2.733 | 1.179 |
| Beach Scene | 3.919 | 1.093 | Beach Scene | 3.593 | 1.180 | Beach Scene | 3.748 | 1.091 |
| Total Visual | 15.378 | 3.155 | Total Auditory | 13.185 | 3.417 | Total Kinesthetic | 12.837 | 3.475 |

TOTAL SCALE X = 41.400 S.D. = 8.869

rater, nor the subject's responses to the Self-Scoring Form of the Sensory Suggestion Scale.

On the 3,919 predicates scored, the raters disagreed on 615, or 15.6% of the predicates. Table 3 presents a breakdown of the three types of discrepent scores and percentages of total ratings across the three types of disagreements.

In 84% of the cases the independent raters agreed on the selection of one of the five possible categories under which a predicate could be scored.

Table 3

Analysis of Rater Discrepancies

in Percentages

| | Type I T vs.N | Type II A/V/K vs. T/N | Type III A vs V vs K |
|---|---|---|---|
| percent of discrepancies (614) | 7% | 74% | 19% |
| percent of total predicates (3,919) | 1% | 11% | 3% |

Tests of the Hypotheses

The four hypotheses were tested by means of a series of multiple regression analyses. Responses to A, V, K suggestions were used as the criterion variables in the first three multiple regression equations. In the fourth equation, the total score of subject's responses on the Sensory Suggestion Scale was used as the

criterion variable. The predictor variables were percentage scores for A, V, K and T predicate production. These scores were based on the total number of predicates (A, V, K, T and N) produced by each subject. These four multiple regression analyses correspond to the four directional hypotheses listed in Chapter I.

Table 4 presents a summary of the first multiple regression analysis. Responses to auditory suggestions is the criterion variable and auditory predicate percentage scores are the expected best predictor.

Table 5 presents a summary of the second multiple regression equation. Responses to visual suggestions are the criterion variable and visual predicate percentage scores are the expected best predictor.

Table 6 presents a summary of the third multiple regression equation. Responses to kinesthetic suggestions are the criterion variable and kinesthetic predicate percentage scores are the expected best predictor.

Table 7 presents a summary of the fourth multiple regression equation. Responses to the total Sensory Suggestion Scale are the criterion variable and kinesthetic predicate percentage scores are the expected best predictor.

Although in some cases, the expected best predictor were the actual best predictors of the criterion variables, none of the hypothesized correlations were significant. Further, only very small amounts of variances were accounted for by these correlations.

Table 4

Summary Table of Multiple Regression Analysis
Predicting Responses to Kinesthetic Suggestions

| Variable | Multiple R | R Square | R Sq Change | Simple R | d.f. | F |
|---|---|---|---|---|---|---|
| K predicates | .12447 | .01549 | .01549 | .12447 | 1/133 | 2.09293 |
| A predicates | .14487 | .02099 | .00550 | .02052 | 2/132 | 1.41493 |
| T predicates | .14733 | .02171 | .00072 | -.08010 | 3/131 | .06891 |
| V Predicates | (F - level insufficient for computation) | | | | | |

Table 5

Summary Table of Multiple Regression Analysis
Predicting Responses to Auditory Suggestions

| Variable | Multiple R | R Square | R Sq Change | Simple R | d.f. | F |
|---|---|---|---|---|---|---|
| V predicates | .10664 | .01137 | .01137 | .10664 | 1/133 | 1.52989 |
| T predicates | .13157 | .01731 | .00594 | .08042 | 2/132 | 1.16270 |
| K predicates | .13284 | .01765 | .00034 | -.00431 | 3/131 | .78445 |
| A predicates | .13369 | .01787 | .00023 | .04207 | 4/130 | .59146 |

Table 6

Summary Table of Multiple Regression Analysis
Predicting Responses to Visual Suggestions

| Variable | Multiple R | R Square | R Sq Change | Simple R | d.f. | F |
|---|---|---|---|---|---|---|
| V predicates | .11127 | .01238 | .01238 | .1127 | 1/133 | 1.66728 |
| K predicates | .15640 | .02446 | .01208 | .05844 | 2/132 | 1.65481 |
| A predicates | .16899 | .02856 | .00410 | .04505 | 3/131 | 1.28360 |
| T predicates | .16965 | .02878 | .00022 | -.04195 | 4/130 | .96310 |

Table 7

Summary Table of Multiple Regression Analysis
Predicting Response to the Sensory Suggestion Scale

| Variable | Multiple R | R Square | R Sq Change | Simple R | d.f. | F |
|---|---|---|---|---|---|---|
| T predicates | .07729 | .00597 | .00597 | -.07729 | 1/133. | .79931 |
| V predicates | .10055 | .01011 | .00414 | .06675 | 2/132 | .67406 |
| K predicates | .13054 | .01704 | .00693 | .06790 | 3/131 | .75697 |
| A predicates | .14086 | .01984 | .00280 | .04027 | 4/130 | .65879 |

An additional intercorrelation matrix was generated for an additional test of the hypotheses using only sensory predicates in the denominator. Using this computation of predicate percentage scores, the auditory percent scores were derived by the equation

$$\frac{A}{A + V + K} \times 100.$$

The equations for V + K percentage scores were the same except for the numerators.

Table 8 presents an intercorrelation matrix for the Sensory Suggestion Response Scores and the percentage of sensory predicate usage scores.

Table 8

Correlation Coefficients of Responses to the Sensory Suggestion Scale and Sensory Predicates Usage

| Sensory Suggestion Scale Scores | Sensory Predicate Usage in Percents | | |
|---|---|---|---|
| | K | A | V |
| A items | .04983 | .11687 | .06729 |
| V items | .10292 | .11266 | .05491 |
| K items | .15763 | -.03707 | .02728 |
| TOTAL | .11757 | .07057 | .05615 |

Although simple correlation values are somewhat higher than found in the multiple regression analyses, using percentages scores

based on sensory predicates alone does little to explain any more of the variance.

Summary

There is very little relationship between the type of predicates a person uses to describe his/her experience of the Sensory Suggestion Scale and the differential responses to the specific sensory suggestions in the scale.

# CHAPTER V

# DISCUSSION

In this chapter, the results of the study are summarized and the findings are discussed. Sections on the Sensory Suggestion Scale, Sensory Predicate Usage and recommendation for revisions of the study and future research are presented. A summary section briefly describes the study and it's implications.

## Sensory Predicate Usage as a Predictor of Response to Sensory Suggestion

This study tested a hypothesized relationship between sensory predicate usage and response to sensory suggestions. It failed to reveal any significant correlations. In some cases, the use of one type of sensory predicate was the best predictor of responses to the same type of sensory suggestion, but the correlations were slight and only a small amount of the variance was accounted for. By treating predicate usage as a continuous variable, NLP's PRS concept was not tested in the manner suggested by Grinder and Bandler (1976). Instead, a more direct relationship between input and output communication was tested. Andreas (1982), an advocate of NLP, criticized Owens (1977) and Gumm et al's (1982) studies in terms of context for eliciting a verbal sample. These authors used questions that had an inherent K bias. Andreas states that PRS changes from context to context. In this study the context was controlled. Regardless of the existence of PRS, one might have

expected higher correlations based simply on the similarity of responding to the Self-Scoring Form and writing about the experience. This did not occur.

In this study, a scale containing A, V and K suggestions was presented. Subjects responded best to the V suggestions. This, if it is a task effected by a subject's PRS, is consistent with remarks made by Grinder and DeLozier at a 1977 workshop attended and commented on by Owens (1977). Grinder and DeLozier predicted a high frequency of subjects having a V PRS in American culture which, they described as a visually oriented society. The high percentage of K predicates produced by subjects in this study is consistent with other research, some of which may be biased as Andreas (1982) has pointed out. Predicate production will be discussed later in this chapter.

In appendix E, data on subject responses to the Sensory Suggestion Scale and sensory predicate usage are presented. This data was correlated and presented in Table 8. The coded data are included in appendix E to allow the reader to look directly at how subjects responded. Several subjects reached or approached 100 percent usage of K predicates, yet these same subjects showed no relationship in terms of high responses to K suggestions. It is clear that grouping subjects into discreet PRS categories using any of the methods used by previous researchers, would render a high percentage of K (PRS) subjects and lend no greater predicative power to the study.

The Sensory Suggestion Scale

Table 2 illustrated mean responses to A, V, K suggestions as well as to the scale as a whole. Subjects responded best to V suggestions. This was true both for independent V suggestions, and for the V parts of mixed suggestions. This response pattern was consistent overall, i.e., the order of preference, V-A-K, remained consistent for individual suggestions and for the individual sensory parts of mixed suggestions.

The Sensory Suggestion Scale was read from a typed script. The script was edited into sections to render eight separate suggestions (2A, 2V, 2K, and 2 mixed). These separate suggestions were edited, i.e., predicates were circled and numbered, and then sent to the raters for predicate scoring. Each suggestion was independently rated by the two raters and disagreements were rescored as N (non-codeable) predicates. The sensory predicate percentages of each suggestion are presented in Table 1.

Discrepancies listed in Table 3 included only subject essays, however, a similar breakdown was found in the scoring of the sensory suggestions. Most disagreements were between K and N ratings of the same predicates. These analyses were post hoc, i.e., they were rated after the session was run. This author and his advisor, Dr. Crapo, developed the scale's suggestions and had attempted to make them as "pure" as possible. In one case, the Friend's Image suggestion, it became difficult to find enough visual predicates. Although no data exist on the number of A, V, and K predicates in

the lexicon, it seems there are more K than A or V options available.

## Recommendations for Revisions of This Study and Future Research

Two main components of this study are the Sensory Suggestion Scale and the instructions used to elicit the subject essays. The scoring system is the most rigorous method thus far developed for assessing predicate usage.

The Sensory Suggestion Scale could be expanded to allow a greater number of suggestions and a higher number of responses in each category. Factor analysis of the responses could allow the development of a more accurate scale.

Consistent with Andreas' (1982) comments in regard to Gumm et al's (1982) study, the addition of neutral stimuli used to elicit a response for predicate tallying may reveal different patterns of predicate production. It is not clear if the types of questions suggested by Andreas--"Tell me about your horse" or "Tell me about your job" (1982, p. 2) may inject their own biases (V for the house, A, V, or K depending on what type of job is involved). The method used in this study employed a balanced multi-sensory experiential event and allowed subjects to write about any aspects of their experience.

## Sensory Predicate Usage

Predicate usage in this study was consistent with other studies reported by Owens (1977) and Gumm et al (1982) in that a high number

of K predicates were used. As the data in appendix E shows=, several subjects either reached or approached 100 percent K predicate usage when only sensory predicates are considered. Only rarely did subjects reach or approach 50 percent usage of either A or V predicates.

Falzett (1981) concluded that counting predicates is not a good indicator of PRS when compared to the eye movement method of determining PRS. He based this conclusion on disagreements between the two methods of classifying the PRS of his subjects and the high K predicate usage he found in his subjects.

Contrary to Falzett's (1981) conclusions high K predicate production does not in and of itself dispell the relationship between predicate usage and the concept of PRS. The results of Owens' study (1977), which found no V subjects and Mattar's study (1980) which found no A subjects, likewise do not refute this relationship between predicate usage and the PRS concept. In all of these cases, the stimuli used to elicit subject responses were biased as Andreas (1982) has noted and some expectation of a normal distribution of A, V, and K subjects was implicitly acknowledged.

Perhaps one should consider a null view of the subject. If PRS does not exist, what sort of predicate usage should be expected? Random usage would render either an equal distribution of A, V, and K predicates or a distribution based on random selection of A, V, and K predicates, with cultural biases and perhaps another factor related to the availability of A, V, and K predicates in the

lexicon. At this time there are no data available to describe what sort of verbal behavior one might expect if PRS was not a valid concept for explaining predicate usage.

This study deviated from the methods used previously by using a written sample, from which predicates were analyzed, instead of an audio-taped oral sample. Although the advantage of having a written data base from which to analyze subjects' verbal behavior is clear, the author admits to a compromise based on economy. Ideally subject's verbal behavior would be collected orally then transcribed. This procedure would be costly and perhaps necessitate collection of data from a smaller sample.

At the time this study was proposed, the compromise of using written essays was accepted based on the following assumptions: (1) writing is an overlay process of oral speech; (2) although it may differ in some instances, e.g., scientific writing, writing can be very similar to speaking if instructions to write as though speaking are given; (3) there is no reason to expect predicate usage to differ between the two methods, given the instructions used in this study.

In a yet unpublished study, Crapo made transcriptions of tape-recorded family interviews. His study investigated the usage of certain linguistic categories by family members when responding to threat or insult statements. The family units contained parents and one child (aged 13 to 17). Content analysis of Crapo's transcripts showed very similar patterns of predicate usage--K =

72%, A = 18%, and V = 9%. In this study, analysis showed predicate usage in the following pattern--K = 68%, A = 14%, and V = 19%. Crapo's data was collected without stimulus questions directly tied to an investigation of PRS. The context was much like that of a family therapy-type situation. In this present study, context was controlled by using a multi-sensory stimulus. It appears that high K predicate usage under controlled conditions is a consistent finding.

Summary

This study has explored the relationship between the use of sensory predicates, which NLP sees as an indicator of PRS, and responses to sensory suggestions. Subjects listened to a scale of individual sensory suggestions worded in the appropriate representational systems and then scored their responses to the A, V, and K sensory suggestions. Following this, subjects wrote essays describing their experience of the Sensory Suggestion Scale. These essays were content analyzed and predicate production was computed into percentage scores. These percentage scores were then used to predict responses to A, V, and K items of the Sensory Suggestion Scale. No significant correlations were found between sensory predicate usage and response to sensory suggestions. In general, subjects responded best to visual suggestions and produced a high percentage of K predicates.

The results of this study were consistent with others in regard to the overall preference for K predicates and, had subjects been

classified into discreet PRS categories, only a small percentage of the subjects would have been classified into A or V PRS categories. Owens (1977) found no A-PRS subjects--hence this study is somewhat consistent with his findings. Falzett (1981) found a high K predicate usage in his study and concluded that predicate usage was a poor predictor of PRS. Andreas (1982) disputes the findings of these researchers based on their use of "K-biased" stimuli; however, she, like the other proponents of NLP, shows no data to substantiate their argument.

Perhaps a better way of understanding PRS is to view it as an ability that could be tested based on performance of tasks involving sensory processing. Mattar (1980) and Shaw (1977) as well as this author used dependent variables that were designed to elicit differential performance based on differing cognitive processing skills. This study has attempted to investigate the PRS concept from a similar point of view.

Sensory suggestions were assumed to be a task that would be differentially responded to based on the PRS of subjects. In fact, subjects did respond differentially to A, V, and K suggestions. Because these differential responses to the specific types of sensory suggestions did not correlate to sensory predicates produced by the subjects, no support for predicate usage as a predictor of PRS was found.

It is the opinion of this author, that PRS in theory is expected to effect the performance of subject's in tasks requiring

A, V, or K processing of information. The Sensory Suggestion Scale represents such a task.

The author accepts the representational system concept. Less accepted is the "preferred" or "primary" representation system concept. Perhaps the fault here lies in the measures used to indicate this type of cognitive processing. The basic premise of the PRS concept is that eye movements and predicate usage are expressions of unconscious processes. It is implied that metaphores are not just another way of stating something, but rather they are representations of an inner reality. In this author's view, representations of such exactness are similar to using "just the right words" to express something-- a task that is performed sometimes better and sometimes not as well. In situations where exact representations of internal experience are less demanded or when time does not permit finding just the right words to perfectly describe one's thoughts, one may, in fact, use words which do not represent experience clearly.

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# FOOTNOTES

[1]Dr. Richley Crapo is a professor of Anthropology and co-chairman of the author's dissertation committee.

# APPENDICES

## Appendix A

### Informed Consent and Release of Information

I, _____, hereby agree to participate in a research project conducted by James M. Talone, Department of Psychology, Utah State University. I understand that I may terminate my participation at any time and that strict confidentiality of my involvement will be maintained. With this understanding in mind, I agree to allow the results of my participation to be reflected in the subsequent report of this research. Furthermore, I understand it is my right to be informed of the procedures being used and that my questions regarding these procedures will not be viewed adversely. I will be allowed to have full details of the experiment explained if I so desire.

Date _____

Signature _____

Witness _____

# Appendix B

## Research Session Transcript

Thank you for helping out in this investigation. To begin this part of the study, make yourself comfortable and close your eyes. Today's session should take between 30 and 40 minutes. In a few minutes I will begin the Imagination scale. This scale contains a variety of different kinds of suggestions. It will be your task to listen to the suggestions and try to experience them as best as you can. Rest assured that there will be nothing personal or embarassing requested of you. After the scale is finished, you will be requested to complete a self-scoring form and write a brief description of your experience. This will all be explained in more detail later. Again, make yourself comfortable and let your eyes remain closed.

### Apple

By directing your thoughts you can see an image of an apple very clearly. First, picture a bowl of fruit sitting on a table. This bowl contains a variety of fruit. Perhaps you see an orange, or a banana, or a pear, but apart from these, an apple shows up...It's your favorite kind...You see first its size and the texture of its skin. Look at its color, perhaps mostly red, but with a little green or yellow also. You see the way the light reflects off the surface of its skin...whether or not it has a stem and maybe a leaf attached. The shape, the size, the color, the shine of its skin make it appear as perfect an apple as you've ever seen. (pause 15") Now you may stop imagining the apple.

Music

Keep your eyes closed. I'd like you now to concentrate on hearing some music.

Faintly at first, you hear a song that is familiar to you. Maybe you heard it on a stereo or car radio, and as it gets louder you can recognize it as a favorite tune of yours. It may be instrumental only or feature a singer, but regardless, it's rhythmic melody is one you can hear clearly. You hear the music as intensely as real music. Listen to it as you create it in your own mind. (pause 15") You may stop thinking of the music now.

Moving Hands (Together)

Please hold both hands up in the air, straight out in front of you palms facing inward--palms facing toward each other. Hold your hands about a foot apart...about a foot apart.

Both arms straight out in front of you with hands about a foot apart...palms facing inward...about a foot apart. Now I want you to imagine a force attracting your hands toward each other, pulling them together. As you feel this force pulling your hands together, they will move together, slowly at first, but they will move closer together, closer and closer together as though a force were acting on them... moving...moving...closer, closer... (pause 15") That's fine. Now place your hands back in their resting position and relax.

Age Regression

Keep your eyes closed. By directing your thinking you can bring back the experience of when you were in elementary school--first, second, third, fourth, or fifth grade.

Think of time going back, going back to elementary school and feel yourself becoming smaller and smaller. Let yourself feel your hands, small and tiny, and your legs and your body, small and tiny. (pause 10") As you go back in time, see yourself sitting in a big desk. See the floor beneath you. Picture the top of the desk. You may see some marks on the desk top, or maybe it's a smooth, shiny surface. There may be a pencil slot and perhaps a large yellow pencil. Observe the other children around you, and the teacher, the bulletin board, the chalkboard, the cloak room and the windows. (pause 10") Listen, and hear the teacher as she takes roll call, calling the names of the children, and they answer up. Listen quietly as the teacher recites a poem, or maybe gives a history lesson. (pause 10") Like most school children, you hear most clearly the ring of the school bell announcing recess. (pause 5") Now tell yourself it's all in your mind and come back to the present.

Telephone Ring

You've been listening well to these instructions and I'd like you to continue hearing what I have to say. As you try, you can create the sound of a telephone ringing. It may sound very faint at first...as if it is coming from somewhere far away...as you listen the sound becomes clearer, and louder...ringing...just like the ringing of a real telephone...The tone of the ring...the frequency...timing of the ring and the silence are just like that of a telephone. As you carefully listen...the sound of the ringing becomes quite clear. You can clearly hear this telephone ring in your mind's ear. (pause 15") The telephone ringing has stopped. It is again quiet.

Hand Levitation

By getting in touch with your thoughts you can make your hand feel as though it is rising easily, without effort. Keep your eyes closed and extend your right arm straight out in front of you at shoulder height with the palm facing down. Now, I want you to feel a stream of water pushing against the palm of your right hand, pushing up against the palm of your hand. Feel a strong stream of water pushing your hand up. Let yourself feel the strong stream of water pushing up against the palm of your hand, pushing it up. Sense the pleasant force of the water, pushing your hand up. (The water may feel warm or cool). The force of the water is very strong and, as you think about it, let your hand begin to rise. Feel your hand rising as you imagine a strong stream of water pushing your hand up, pushing it up, and up, and up, rising...lifting. A strong stream of water is pushing your hand up and up, raising your arm and hand higher and higher as the strong stream of water supports your hand and arm at a comfortable position. (pause 15") Now relax your hand and arm to a resting position. They are perfectly normal again.

Friend's Image

Keep your eyes closed. By using your imagination, you can create the image of a friend.

Picture yourself at a grassy park. You see a blue, almost cloudless sky and the trees are covered with green leaves. At some distance you see a familiar figure approaching. As the person comes near you can more clearly see who it is. You recognize the face of your friend and notice the smile he flashes as your eyes meet. You smile back as you pass. In your mind's eye you can hold the image of your friend's face and look at it carefully. Notice the color of his hair and eyes...

Whether he has a beard, or mustache, or if he is clean shaven?...Is his hair cut short or grown out long?...Notice also if your friend has a light or dark complexion...Look closely at your friend's features. (pause 15") Now you may stop visualizing your friend.

Mind-Body Relaxation

Picture yourself on a beautiful day, lying on the beach or an ocean or lake listening to the sounds of birds. Feel yourself lying on a soft beach towel watching the water and hearing the breeze as it blows by you. Let yourself feel the soothing warmth of the sun...see the bright blue sky...and listen to the rhythmic sounds of the water lapping along the beach. See yourself lying down. Let yourself feel peacefully relaxed. Hear the rhythm of your own breathing. You're comfortably relaxed... enjoy it (pause 15") Now as you open your eyes, let yourself continue to feel relaxed and yet perfectly alert and normal again...open your eyes.

Now please turn to the self scoring form for the Imagination scale. Please write the number from the Informed Consent and Release of Information form that you signed earlier.

Read the statements below describing the possible responses for each item. Then, circle the number (0, 1, 2, 3, or 4) which corresponds to the statement that most nearly matches your experience.

Please answer each item as honestly as possible. There are no right or wrong answers.

We'd like you to try to describe what you experienced in words that really express the experience you had. You are free to use any words you wish to describe your experience.

You will have ten minutes to write down the description of your experience. Please use as much of the six minutes as you need in order to be certain that you have described the events as exactly as possible. Please write as clearly as possible and double space. Go ahead and begin now.

You are now ready to begin the next segment of this research investigation.

During the next few minutes you will be asked to think about what you experienced during the previous Creative Imagination task. Think about all aspects of your experience beginning with the time when you closed your eyes as the voice on the tape asked and concluding with when the voice on the tape asked you to open them after the last suggestion.

You have one minute remaining...

The ten minutes are up. If you are still writing, please finish the thought you are working on quickly.

(30" pause)

The experimenter in the room with you will have some concluding remarks. Thank you again for your participation.

## Appendix C

## Self-Scoring Form

## for the Imagination Scale

Please answer each item as honestly as possible. There are no right or wrong answers.

Read the statements below describing the possible responses for each item. Then, circle the number (0, 1, 2, 3. or 4) which corresponds to the statement that most nearly matches your experience.

1. In the first test you were asked to see the image of an apple. Compared to what you would have experienced if you were actually looking at an apple, what you experienced was:

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| 0% Not at all the same | 25% A little the same | 50% Between a little and much the same | 75% Much the same | 90+% Almost exactly the same |

2. In the second test you were asked to imagine hearing some favorite piece of music. Compared to what you would have experienced had you actually been listening to the music, what you experienced was:

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| 0% Not at all the same | 25% A little the same | 50% Between a little and much the same | 75% Much the same | 90+% Almost exactly the same |

3. In the third test you were asked to hold your hand out in front of you and experience a force moving your hands together. Compared

to what you would have experienced if your hands actually had a force attracting them towards each other, what you experienced was:

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| 0% Not at all the same | 25% A little the same | 50% Between a little and much the same | 75% Much the same | 90+% Almost exactly the same |

4. In the fourth test you were asked to think back to a time when you were in elementary school. You were asked specifically to see yourself sitting in a big desk, seeing the marks on the desk, the other children, the teacher, the bulletin board and the chalk board, seeing a pencil slot on the desk, and a big yellow pencil. Compared to what you would have seen had you actually been back in elementary school, what you experienced was:

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| 0% Not at all the same | 25% A little the same | 50% Between a little and much the same | 75% Much the same | 90+% Almost exactly the same |

5. In the fourth test you were asked to think back to a time when you were in elementary school. You were asked to specifically hear the sounds of the classroom, listen to the teacher taking roll, recite a poem and/or the history lesson, and the school bell announcing recess. Compared to what you would have heard had you actually been back in elementary school, what you experienced was:

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| 0% Not at all the same | 25% A little the same | 50% Between a little and much the same | 75% Much the same | 90+% Almost exactly the same |

6. In the fourth test you were asked to think back to a time when you were in elementary school. You were asked specifically to feel like a small elementary school child; feeling small and tiny like a little boy or girl might feel. Compared to what you would have felt had you actually been back in elementary school, what you experienced was:

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| 0% Not at all the same | 25% A little the same | 50% Between a little and much the same | 75% Much the same | 90+% Almost exactly the same |

7. In the fifth test you were asked to hear the sound of a telephone ringing. Comapred to what you would have experienced if a telephone were actually ringing, what you experienced was:

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| 0% Not at all the same | 25% A little the same | 50% Between a little and much the same | 75% Much the same | 90+% Almost exactly the same |

8. In the sixth test you were asked to feel a strong stream of water from a hose pushing up against the palm of your hand. Compared to what you would have experienced if a strong stream of water were actually pushing up against your palm, what you experienced was:

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| 0% Not at all the same | 25% A little the same | 50% Between a little and much the same | 75% Much the same | 90+% Almost exactly the same |

9. In the seventh test you were asked to create the image of a friend. Compared to what you would have experienced if you had actually been looking at your friend, what you experienced was:

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| 0% Not at all the same | 25% A little the same | 50% Between a little and much the same | 75% Much the same | 90+% Almost exactly the same |

10. In the eighth test you were asked to think of yourself at a beach. Specifically you were asked to picture the beach on a beautiful day, see yourself there, and see the bright blue sky. Compared to what you would have seen had you actually been at the beach, what you experienced was:

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| 0% Not at all the same | 25% A little the same | 50% Between a little and much the same | 75% Much the same | 90+% Almost exactly the same |

11. In the eighth test you were asked to think of yourself at a beach. Specifically you were asked to hear the sounds of the water splashing against the beach, the sounds of birds, and the sounds of the breeze blowing by your ear. Compared to what you would have heard had you actually been at the beach, what you experienced was:

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| 0% Not at all the same | 25% A little the same | 50% Between a little and much the same | 75% Much the same | 90+% Almost exactly the same |

12. In the eighth test you were asked to think of yourself at a beach. Specifically you were asked to feel yourself lying on the soft beach towel, the soothing warmth of the sun, and feeling comfortably relaxed. Compared to what you would have felt if you had actually been at the beach, what you experienced was:

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| 0%<br>Not at all the same | 25%<br>A little the same | 50%<br>Between a little and much the same | 75%<br>Much the same | 90+%<br>Almost exactly the same |

# Appendix D

## Instructions for Judges

### Introduction

You have been asked to assist in an empirical investigation being undertaken as a dissertation research project. Thank you for your willingness to participate with me in this project. The following instructions are designed to acquaint you with your part in this psychological investigation. It will be important for you to clearly understand part of the theoretical background of this endeavor. To this end these instructions have been written.

Much of this appendix was reprinted from Grinder and Bandler (1976) and also from Mattar's (1980) dissertation. It describes the notion of the Primary Representational System (PRS) and you will become familiar with it as the basic source for scoring subject protocols.

Grinder and Bandler (1976) describe three basic types of predicates that are either A (auditory), V (visual), or K (kinesthetic). These will be described in great detail in the rest of this appendix. What won't be described there are two other types of predicates, T (thought) and N (noncodeable) predicates. These two categories should allow you to score any predicates that are not sensory.

T predicates are words that describe a non-sensory experience such as "I think", "I believe", or "I understand". They represent an abstract internal experience. In scoring a predicate, you should first attempt to categorize the word in terms of it being either A, V, K, or T. You will be scoring predicates from a copy of a hand written essay,

you will be asked to score only the underlined words. We'd like you to consider first the word itself, then, if necessary, use the context in which it is used in the sentence.

Some words, you may find, are simply not codeable as either A, V, K, or T. The verb, "to be" is an example. If the underlined word, even in the context of the rest of the sentence is not codeable as either A, V, K, or T, then score it as an N word.

In some cases, you may find a particular predicate that both by itself and in the context of the sentence, seems to be representing two sensory (including T) modalities. In these cases, you may score that predicate twice.

Three lists of predicates are presented following the portion of this appendix that was reprinted from Grinder and Bandler. These may serve as a guide in understanding what A, V, and K predicates are. The lists are not at all complete. This task is largely a matter of judgement. Remember, you need only score the underlined words and feel free to consult me if you have any questions.

Representational Systems

Each of us, as human beings, has available a number of different ways of representing our experience of the world. Following are some examples of the representational systems each of us can use to represent our experiences.

We have five recognized senses for making contact with the world - we <u>see</u>, we <u>hear</u>, we <u>feel</u>, we <u>taste</u>, we <u>smell</u>. In addition to these sensory systems, we have a language system which we use to represent our experience. We may store our experience directly in the representational system most closely associated with that sensory channel. We may choose

to close our eyes and create a visual image of a red square shifting to green and then to blue, or a spiral wheel of silver and black slowly revolving counter-clockwise, or the image of some person we know well. Or, we may choose to close our eyes (or not) and to create a kinesthetic representation (a body sensation, a feeling), placing our hands against a wall and pushing as hard as we can, feeling the tightening of the muscles in our arms and shoulders, becoming aware of the texture of the floor beneath our feet. Or, we may choose to become aware of the prickling sensation of the heat of the flames of a fire burning, or of sensing the pressure of several light blankets covering our sighing bodies as we sink into bed. Or, we may choose to close our eyes and create an auditory (sound) representation - the patter of tinkling raindrops, the crack of distant thunder, the squeal of singing tires on a quiet country road, or the blast of a taxi horn through a noisy city. Or, we may close our eyes and create a gustatory (taste) representation of the sour flavor of a lemon, or the sweetness of honey, or the saltiness of a stale potato chip. Or, we may choose to close our eyes and create an olfactory (smell) representation of a fragrant rose, or rancid milk, or the pungent aroma of a cheap perfume.

Some of you may have noticed that, while reading through the descriptions of the above paragraph, you actually experienced seeing a particular color or movement; feeling hardness, warmth, or roughness; hearing a specific sound; experiencing certain tastes or smells. You may have experienced all or only some of these sensations. Some of them were more detailed and immediate for you than others. For some of the descriptions you may have had no experience at all. These differences in your experiences are exactly what we are describing. Those of you who had a

sharp, clear picture of some experience have a rich, highly developed visual representational system. Those of you who were able to develop a strong feeling of weight, temperature, or texture have a refined, highly developed kinesthetic representational system. And so on with the other possible ways associated with our five senses that we, as humans, have of representing our experiences.

Notice that the description in the last paragraph is missing something. Specifically, each of the descriptions in the last paragraph was not represented in specific sensory systems, but rather in a language system - the digital representational system. We described with words, phrases, and sentences the experiences in the different representational systems. We selected these words carefully - for example, if we want to describe something in the visual representational system, we select words such as: black, clear, spiral, image...If we want to describe something in an auditory system, we select words such as: tinkling, silent, squeal, blast...This sentence is an example of the way that we represent our experience in the language. This ability which we have to represent our experiences in each of our different representational systems with words - that is, in the digital system - identifies one of the most useful characteristics of language representational systems - their universality. That is to say, by using our language representational systems, we are able to present our experience of any of the other representational systems. Since this is true, we refer to our language system as the digital system. We can use it to create a map of our world. When we use the sentence:

He showed me some vivid images.

we are creating a language map of our visual map of some experience

which we have had. We may choose to create a language representation by combining different representational systems. When we use the sentence:

> She reeled backwards, tripping over the screaming animal writhing with pain from bitter smoke choking the sunlight out.

we are using a language representation which presupposes a series of maps of our experience, at least one from each of these five representational systems. For example:

| | | |
|---|---|---|
| reel | presupposes | visual and kinesthetic maps; |
| backwards | presupposes | visual and kinesthetic maps; |
| tripping | presupposes | visual and kinesthetic maps; |
| screaming | presupposes | an auditory map; |
| writhing | presupposes | kinesthetic and visual maps; |
| pain | presupposes | a kinesthetic map; |
| bitter | presupposes | gustatory and olfactory maps; |

At this point you may have noticed that it is easier for you to create an experience which is more vivid in one of these representational systems than in others. For instance, you may be able to close your eyes and see very clearly your closest friend but find it difficult to fully experience the smell of a rose. Or you may have found it easy to experience hearing a taxi horn, but found it very difficult to picture in your mind your closest friend. To some degree, each of us has, potentially, the ability to create maps in each of the five representational systems. However, we tend to use one or more of these representational systems as a map more often than the others. We also tend to have more distinctions available in this same representational system to code our experience, which is to say that we more highly value one or more of these representational systems. For instance, those of you who have a highly valued visual representational system will have been able to close your eyes and vividly "see" a red square which became green and then blue. Also, you probably were able to make a very rich, clear picture

of your closest friend. It is likely that you assume that other people who read this paper will have this same experience. This is not true in all cases. The representational systems that are highly valued and highly developed in each of us will differ, either slighly or dramatically. Many people can make only vague pictures and some, no pictures at all. Some people must try for an extended period of time before they are capable of making a vivid image, and some can create a vivid image almost instantly. This wide variation in the capability to create a visual representation is also true of all the other representational systems.

Identifying the Most Highly Valued Representational System

In order to identify which of the representational systems is the client's most highly valued one, the therapist needs only to pay attention to the predicates which the client uses to describe his experience. In describing his experience, the client makes choices (usually unconsciously) about which words best represent his experience. Predicates are words used to describe the portions of a person's experience which correspond to the processes and relationships in that experience. Predicates appear as verbs, adjectives and adverbs in the sentences which the client uses to describe his experience. For example, in the following sentence, examples of each of these categories of predicates occur:

She saw the purple pajamas clearly.

The predicates in this sentence are:

| | |
|---|---|
| verb: | saw |
| adjective: | purple |
| adverb: | clearly |

Exercise A - Identify the predicates in each of the sentences below.

| | |
|---|---|
| He felt badly about the way she held the crawling child. | verbs - felt, held<br>adjective - crawling<br>adverb - badly |
| The dazzling woman watched the silver car streak past the glittering display. | verbs - watched, streak<br>adjectives - dazzling, silver glittering |
| He called out loudly as he heard the squeal of the tires of the car in the quiet streets. | verbs - called, heard<br>adjective - quiet<br>adverb - loudly |
| The man touched the damp floor of the musty building. | verb - touched<br>adjectives - damp, musty |

Exercise B - Identifying Representational Systems by Predicates.

After you have identified the predicates in the above sentences, return to them and determine which representational system or systems each of them implies. Notice that some of them are ambiguous with respect to representational systems - for example, the predicate light may imply either a kinesthetic representational system or a visual one, depending upon its use. Or, the predicate tighten in a sentence such as:

She tightened her body.

may imply a visual or kinesthetic represenation, as I can verify the experience described in the sentence either by touch or by watching the muscle contractions of the person's body. One way to assist yourself when you are uncertain which representational system is involved is to ask yourself what you would have to do to verify the description given by the predicate and its sentence.

We would like to mention at this time that, in our training seminars, the common reaction which we receive to identifying highly valued representational systems by identifying predicates is one of disbelief. We would like you to realize that very little of natural language communi-

cation is really metaphorical. Most people, in describing their experiences, even in casual conversation, are quite literal. Comments such as "I see what you're saying" are most often communicated by people who organize their world primarily with pictures. These are people whose most highly valued representational system is visual. And they are literally "making pictures" out of what they hear.

In conclusion, most students of this technique first go through a stage of not believing this; secondly, they begin to listen to people in this new way and become amazed at what they can learn about themselves and those around them; thirdly, they learn the value of this knowledge. May I suggest that you begin to listen to yourself and the people around you in these terms as you prepare for your role in this investigation. Specifically you will be asked to do the following exercise to develop these new skills.

(Reprinted in part from Bandler and Grinder, 1975, pp.6-11.)

Representative List of Auditory Predicates

| | |
|---|---|
| tinkling | sizzle |
| silent | swish |
| squeal | creak |
| blast | whisper |
| called | mutter |
| loudly | acoustic |
| heard | peace |
| say | shrill |
| listen | uproarious |
| sounds | snap |
| crackle | rap |
| snap | tap |
| pop | knock |
| resonate | click |
| ring | clash |
| chime | slam |
| clang | rustle |
| bass | moan |
| snore | hoarse |

clink
jingle
reverberate
echo
murmur
boom
thunder
resound
mute
hushed
still
audible
accent
thud
muffled
buzz
hiss
fizz
drum
drone
rumble
volley
explode
detonate
rattle
tick
thud
muffler
wail
howl
bellow
purr
lyric
chatter
melody
yell
harmony
clatter

Auditory:

i) Verb Forms:

listen
hear
sounds (like, good)
talk
laugh
shout/whisper
speak
screech
tell
sing
hark
eavesdrop
overhear
make oneself heard
utter
vocalize
pronounce
hum
intone

ii) Adverbs/Adjectives/Nouns:

sound
clapping
loud/quiet
noisy
silent
tone
auditory
cadence
harmony
rasping
dissonant
melodic
fluent
voice
aural
inflection
sharp/flat
twangy
nasal
tuned
tempo
high-pitched/low
audible
accented
deafening
pitch
key
articulate
verbal

iii) Expressions:

I'm all ears
in other words
tune in
in tune with
call to mind
lend an ear
at the top of one's voice
hard of hearing
keep one's ears open (to the ground)
not hear of
unheard of
I'll say
hear! hear!
give a hearing to...

A Representative List of Visual Predicates

see
bright
clear
show
pictures
images
colored
black
spiral
vivid
green
red
blue
orange
gaze
stare
leer
perceive
recongnize
witness
stripe
streak
checker
fleck
speckle
sprinkle
radiant
murky
dusky
overcase
resplendent
glassy
illuminate
dot
tatoo
inlay
hue
kaleidoscope
stare
eagle-eyed
panorama
scan
inspect
squint
leer
ogle
plaid
mossaiced
blindfold
undiscerning
darkly
blinder
glare
glower
plain
obvious
vanish
dissolve
fade
eclipse
resemble
feature
outline
contour
silhouette
provile
angle
shape
guise
outlook
view
scenery
display
expose
dim
obscure
shadowy
blur
concealed
inconspicuous
materialized
flashy
transparent
dazzle
gaudy

Visual:

i) Verb Forms:

squint
looks
like
see (into, out, trhough)
imagine
picture
focus
show
appear
envision
observe
spy
visualize
wink
glimpse
watch
scan
position
look (after, back, down on, for, forward to, into, on, out to, up to, etc.)
eye
glance
ogle
gaze at
peer
peek/peep
glare
stare

ii) Adverbs/Adjectives/Nouns:

farsighted
leering
visible
clear-cut
glossy
perspective
angle
various colours
length/width
bright/dark/dim
clear
bare
sighted
pale
shade
glance
clarity
shiny

iii) Expressions:

see eye to eye
see fit to
see red
see the light (of day)
see you later
form a mental picture of...
gave one the eye
look askance
at first sight

Representative List of Kinesthetic Predicates

pain
feel
felt
touched
damp
musty
contact
impact
graze
brush
lick
manipulate
rub
knead
massage
handle
finger
grope
stroke
tickling
tingle
sting
prick
prickle
crawly
creepy
numb
deaden
paralyze
unfeeling
dazed
ache
twinge
hurt
cut
sore
spasm
cramp
throb
convulsion

torture
agony
anguish
rack
bleed
writhe
wince
chafe
gnaw
torment
agonize
crucity
faw
poignant
aching
heat
blush
fever
warmth
broil
bake
sweat
swelter
bask
boil
singe
heave
melt
seethe
ardent
torrid
fervent
biting
nipping
frigid
stifling
suffocating
flannel
wool
fur

sear
corrode
inflammatory
scratch
hairy

Kinesthetic:

i) Verb Forms:

touch
feel
caress
hold
cuddle
stroke
fondle
slap
punch
push
shove
clasp
pull
behold
run through
caught up
move
grasp
depress
gouge
sting

ii) Adverbs/Adjectives/Nouns:

rough/smooth
soft/hard
pressure
sharp/dull
warm/cold
moving
tactile
graceful
stirring
itchy
slippery
texture
touching
light touch
fingering
handy
tingling

iii) Expressions:

get in touch with
get a handle on
blown away
tied together
gut level
feel it in one's bones
against the grain
touch upon
pin down
put on
carried away with
I'm up (down)
let imagination run wild
pull it off
to be tickled by something
run fingers over
feel for
give one the shivers

Unspecified/Neutral:

i) Verb Forms:

| | |
|---|---|
| heed | translate |
| learn | do |
| seem | make |
| describe | concentrate |
| think | enjoy |
| conceptualize | rehearse |
| suggest | consider |
| bring | realize |
| decide | access |
| allow | communicate |
| know | notice |
| understand | examine |
| perceive | happen |
| search (for) | occur |
| remember | contemplate |

ii) Adjectives/Adverbs/Nouns:

| | |
|---|---|
| productive | attractive |
| commanding | creative |
| attentive | event |
| accomplished | thing |
| related | object |
| successful | meaningful |
| something | important |
| appropriate | useful |
| interesting | specific |

iii) Expressions:

pay attention to
bring into your awareness
come to mind
How are you doing?
What's happening with you, now?
deal with

## Appendix E

### Subject Responses to the Sensory Suggestion Scale and Sensory Predicate Usage

| | Sensory Suggestions Scores by Type of Item | | | | % Predicate Production $(\frac{X}{A+V+K}) \times 100$ | | |
|---|---|---|---|---|---|---|---|
| Subject | A | V | K | Total | K | A | V |
| 1 | 14 | 17 | 14 | 45 | 5385 | 1538 | 3077 |
| 2 | 15 | 19 | 13 | 47 | 6667 | 1111 | 2222 |
| 3 | 18 | 20 | 16 | 54 | 6500 | 0 | 3500 |
| 4 | 8 | 9 | 4 | 21 | 4000 | 2000 | 4000 |
| 5 | 13 | 15 | 13 | 41 | 7273 | 2727 | 0 |
| 6 | 15 | 18 | 11 | 44 | 7647 | 1176 | 1176 |
| 7 | 18 | 20 | 13 | 51 | 4800 | 1200 | 4000 |
| 8 | 15 | 15 | 18 | 48 | 10000 | 0 | 0 |
| 9 | 14 | 15 | 12 | 41 | 8235 | 0 | 1765 |
| 10 | 13 | 18 | 15 | 46 | 9167 | 0 | 833 |
| 11 | 7 | 16 | 13 | 36 | 6786 | 2143 | 1071 |
| 12 | 12 | 15 | 19 | 46 | 5517 | 1379 | 3103 |
| 13 | 15 | 17 | 15 | 47 | 5200 | 2800 | 2000 |
| 14 | 9 | 15 | 12 | 36 | 9286 | 0 | 714 |
| 15 | 9 | 13 | 11 | 33 | 6923 | 1538 | 1538 |
| 16 | 12 | 15 | 9 | 36 | 6000 | 1500 | 2500 |
| 17 | 15 | 14 | 12 | 41 | 7143 | 2143 | 714 |
| 18 | 6 | 10 | 11 | 27 | 8235 | 1765 | 0 |
| 19 | 14 | 20 | 17 | 51 | 4400 | 1600 | 4000 |
| 20 | 20 | 19 | 18 | 57 | 4500 | 3500 | 2000 |
| 21 | 15 | 18 | 15 | 48 | 4615 | 2308 | 3077 |
| 22 | 14 | 16 | 11 | 41 | 6000 | 3333 | 667 |
| 23 | 13 | 14 | 15 | 42 | 7037 | 1852 | 1111 |
| 24 | 17 | 18 | 11 | 46 | 5882 | 1765 | 2353 |
| 25 | 17 | 18 | 11 | 46 | 4500 | 3500 | 2000 |
| 26 | 10 | 17 | 17 | 44 | 5909 | 1364 | 2727 |
| 27 | 19 | 17 | 12 | 48 | 8261 | 870 | 870 |
| 28 | 19 | 20 | 17 | 56 | 5200 | 1600 | 3200 |
| 29 | 14 | 18 | 14 | 46 | 9231 | 0 | 769 |
| 30 | 10 | 13 | 10 | 33 | 5652 | 1304 | 3043 |
| 31 | 20 | 20 | 20 | 60 | 1250 | 3750 | 5000 |
| 32 | 17 | 19 | 16 | 52 | 9000 | 1000 | 0 |
| 33 | 17 | 16 | 13 | 46 | 8750 | 0 | 1250 |
| 34 | 12 | 14 | 14 | 40 | 8333 | 0 | 1667 |
| 35 | 7 | 12 | 7 | 26 | 4000 | 4000 | 2000 |
| 36 | 16 | 17 | 14 | 47 | 8889 | 0 | 1111 |
| 37 | 13 | 12 | 17 | 42 | 3810 | 1905 | 4286 |
| 38 | 12 | 15 | 14 | 41 | 7429 | 286 | 2286 |
| 39 | 15 | 20 | 15 | 50 | 6316 | 1579 | 2105 |
| 40 | 18 | 20 | 16 | 54 | 8056 | 833 | 1111 |

| Subject | Sensory Suggestions Scores by Type of Item | | | | % Predicate Production $(\frac{X}{A+V+K}) \times 100$ | | |
|---|---|---|---|---|---|---|---|
| | A | V | K | Total | K | A | V |
| 41 | 17 | 19 | 17 | 53 | 4211 | 1579 | 4211 |
| 42 | 18 | 17 | 20 | 55 | 7619 | 1429 | 952 |
| 43 | 10 | 11 | 9 | 30 | 8000 | 333 | 1667 |
| 44 | 12 | 14 | 10 | 36 | 5625 | 1250 | 3125 |
| 45 | 17 | 16 | 14 | 47 | 5909 | 1818 | 2273 |
| 46 | 8 | 12 | 9 | 29 | 4545 | 2727 | 2727 |
| 47 | 9 | 10 | 12 | 31 | 9048 | 476 | 476 |
| 48 | 14 | 15 | 9 | 38 | 9333 | 667 | 0 |
| 49 | 18 | 19 | 16 | 53 | 7273 | 909 | 1818 |
| 50 | 16 | 17 | 16 | 49 | 7241 | 1724 | 1034 |
| 51 | 18 | 20 | 17 | 55 | 6538 | 2308 | 1154 |
| 52 | 12 | 15 | 15 | 42 | 5862 | 3103 | 1034 |
| 53 | 12 | 13 | 8 | 33 | 8182 | 909 | 909 |
| 54 | 17 | 18 | 13 | 48 | 7500 | 1071 | 1429 |
| 55 | 18 | 15 | 13 | 46 | 5556 | 2222 | 2222 |
| 56 | 13 | 18 | 15 | 46 | 7647 | 2353 | 0 |
| 57 | 10 | 15 | 11 | 36 | 6857 | 1429 | 1714 |
| 58 | 15 | 16 | 16 | 47 | 9474 | 0 | 526 |
| 59 | 12 | 15 | 11 | 38 | 6800 | 2000 | 1200 |
| 60 | 14 | 14 | 14 | 42 | 5000 | 1818 | 3182 |
| 61 | 15 | 18 | 9 | 42 | 9167 | 0 | 833 |
| 62 | 10 | 15 | 16 | 41 | 9130 | 435 | 435 |
| 63 | 15 | 17 | 14 | 46 | 7826 | 870 | 1304 |
| 64 | 16 | 15 | 17 | 48 | 6667 | 2121 | 1212 |
| 65 | 17 | 17 | 16 | 50 | 10000 | 0 | 0 |
| 66 | 12 | 16 | 11 | 39 | 6333 | 2333 | 1333 |
| 67 | 12 | 14 | 14 | 40 | 8000 | 1333 | 667 |
| 68 | 17 | 18 | 11 | 46 | 4348 | 3043 | 2609 |
| 69 | 10 | 11 | 13 | 34 | 5455 | 909 | 3636 |
| 70 | 10 | 12 | 8 | 30 | 5000 | 714 | 4286 |
| 71 | 13 | 14 | 7 | 34 | 4815 | 2593 | 2593 |
| 72 | 12 | 18 | 12 | 42 | 6429 | 2857 | 714 |
| 73 | 16 | 17 | 12 | 45 | 6190 | 1429 | 2381 |
| 74 | 15 | 19 | 19 | 53 | 6207 | 2414 | 1379 |
| 75 | 16 | 18 | 15 | 49 | 4138 | 3103 | 2759 |
| 76 | 15 | 18 | 15 | 48 | 7083 | 417 | 2500 |
| 77 | 13 | 13 | 11 | 37 | 8750 | 0 | 1250 |
| 78 | 12 | 14 | 9 | 35 | 7647 | 1765 | 588 |
| 79 | 7 | 13 | 7 | 27 | 5455 | 909 | 3636 |
| 80 | 15 | 19 | 15 | 49 | 9200 | 0 | 800 |
| 81 | 14 | 15 | 14 | 43 | 6250 | 1250 | 2500 |
| 82 | 17 | 16 | 14 | 47 | 9000 | 500 | 500 |
| 83 | 11 | 13 | 10 | 34 | 7143 | 714 | 2143 |
| 84 | 13 | 19 | 12 | 44 | 7895 | 526 | 1579 |
| 85 | 12 | 16 | 9 | 37 | 8182 | 909 | 909 |
| 86 | 16 | 16 | 11 | 43 | 5714 | 1429 | 2857 |
| 87 | 13 | 17 | 12 | 42 | 4286 | 2857 | 2857 |

| Subject | Sensory Suggestions Scores by Type of Item | | | | % Predicate Production $(\frac{X}{A+V+K}) \times 100$ | | |
|---|---|---|---|---|---|---|---|
| | A | V | K | Total | K | A | V |
| 88 | 14 | 17 | 13 | 44 | 4000 | 3000 | 3000 |
| 89 | 8 | 9 | 7 | 24 | 8750 | 1250 | 0 |
| 90 | 12 | 17 | 18 | 47 | 7333 | 1333 | 1333 |
| 91 | 13 | 15 | 13 | 41 | 5357 | 2143 | 2500 |
| 92 | 14 | 17 | 15 | 46 | 5333 | 667 | 4000 |
| 93 | 10 | 13 | 15 | 38 | 8750 | 625 | 625 |
| 94 | 9 | 13 | 9 | 31 | 4762 | 2857 | 2381 |
| 95 | 17 | 20 | 13 | 50 | 6667 | 2381 | 952 |
| 96 | 14 | 17 | 20 | 51 | 7419 | 0 | 2581 |
| 97 | 9 | 10 | 10 | 29 | 6316 | 1579 | 2105 |
| 98 | 15 | 15 | 11 | 41 | 10000 | 0 | 0 |
| 99 | 11 | 11 | 9 | 31 | 7500 | 1667 | 833 |
| 100 | 16 | 18 | 15 | 49 | 6250 | 3125 | 625 |
| 101 | 13 | 15 | 14 | 42 | 6111 | 833 | 3056 |
| 102 | 14 | 16 | 9 | 39 | 6667 | 2778 | 556 |
| 103 | 11 | 14 | 17 | 42 | 8182 | 1364 | 455 |
| 104 | 4 | 7 | 7 | 18 | 5000 | 2500 | 2500 |
| 105 | 18 | 18 | 15 | 51 | 6129 | 1613 | 2258 |
| 106 | 17 | 19 | 14 | 50 | 8333 | 1111 | 556 |
| 107 | 12 | 12 | 14 | 38 | 7241 | 0 | 2759 |
| 108 | 14 | 11 | 12 | 37 | 5263 | 1579 | 3158 |
| 109 | 12 | 13 | 8 | 33 | 5455 | 2727 | 1818 |
| 110 | 10 | 13 | 9 | 32 | 5000 | 2000 | 3000 |
| 111 | 16 | 17 | 16 | 49 | 10000 | 0 | 0 |
| 112 | 14 | 15 | 14 | 43 | 7308 | 1154 | 1538 |
| 113 | 6 | 11 | 5 | 22 | 7407 | 1111 | 1481 |
| 114 | 13 | 12 | 8 | 33 | 5714 | 2143 | 2143 |
| 115 | 13 | 19 | 15 | 47 | 7308 | 2308 | 385 |
| 116 | 9 | 15 | 9 | 33 | 8148 | 741 | 1111 |
| 117 | 15 | 14 | 15 | 44 | 5294 | 1765 | 2941 |
| 118 | 9 | 11 | 11 | 31 | 8889 | 1111 | 0 |
| 119 | 15 | 16 | 19 | 50 | 6875 | 1250 | 1875 |
| 120 | 12 | 14 | 10 | 36 | 6667 | 2222 | 1111 |
| 121 | 11 | 9 | 14 | 34 | 9333 | 667 | 0 |
| 122 | 18 | 19 | 15 | 52 | 4643 | 3929 | 1429 |
| 123 | 16 | 18 | 14 | 48 | 6000 | 2000 | 2000 |
| 124 | 10 | 12 | 10 | 32 | 7273 | 909 | 1818 |
| 125 | 12 | 15 | 11 | 38 | 5833 | 2083 | 2083 |
| 126 | 13 | 17 | 11 | 41 | 8065 | 0 | 1935 |
| 127 | 8 | 14 | 9 | 31 | 8462 | 0 | 1538 |
| 128 | 11 | 11 | 9 | 31 | 5000 | 625 | 4375 |
| 129 | 11 | 15 | 15 | 41 | 10000 | 0 | 0 |
| 130 | 12 | 18 | 18 | 48 | 8571 | 476 | 952 |
| 131 | 9 | 16 | 16 | 41 | 6667 | 0 | 3333 |
| 132 | 14 | 19 | 16 | 49 | 6364 | 1515 | 2121 |
| 133 | 11 | 13 | 11 | 35 | 5926 | 1852 | 2222 |
| 134 | 14 | 15 | 12 | 41 | 9565 | 0 | 435 |

# VITA

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