NOVICE COUNSELLORS' COGNITIVE SCHEMA

by

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ABSTRACT

In addition to much discussion on clarifying the purpose, goals, and means of counselling training, there have been numerous attempts to build empirically the theoretical concepts pertaining to developmental changes in counsellor trainees. Traditionally such studies have followed a process-outcome research design, isolating behaviours, general characteristics, and attitudes of beginning counsellors.

Recently, several researchers have distinguished between outcome, or process-product research, and higher-order process, or cognitive-mediational paradigms. This study introduces some new methodology using this cognitive-mediational design. Counsellor trainee cognitive processes is explored. A combination of multi-dimensional scaling and qualitative data evaluation are used as sources to study the nature of novice counsellor cognitive schema. Tentative conclusions regarding the use of this new methodology are discussed.

ACKNOWLEDGEMENTS

DEDICATION

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CHAPTER I

INTRODUCTION

To date, much of what is known about counselling effects has been gained through research conducted within a process-product paradigm (Martin, 1984a). Studies of this kind have centred around isolating counsellor and client characteristics, behaviours, personality traits, and attitudes (Martin, 1984a; Scofield & Yoxtheimer, 1983; Wexler, 1974). Conceptually, such information has been useful in building a knowledge base of a range of counsellor and client characteristics and behaviours that are associated with effective performance. Little is offered, however, of guiding principles that specify the most effective way to **achieve** mastery as a counsellor (Hill & O'Grady, 1985; Martin, Martin, Meyer & Slemon, 1986). More specifically, relating characteristics, behaviours and attitudes to performance tells us nothing about the type or level of skills an effective counsellor requires (Schmidt, 1984).

The emphasis in many graduate level counsellor training programs is on teaching <u>skills</u>, with the assumption being that effective instructional methods produce effective counsellor performance (Hirsch & Stone, 1982). Such a framework is congruent with process-product research methodology. Researchers are beginning to question, however, whether development as a counsellor is more than a description of desirable characteristics or an incremental accretion of skills. Some evidence exists that underlying counsellor perception of the

counselling process influences the use of skills (Loganbill, Hardy & Delworth, 1982; Kagan, 1975; Martin, 1985; Schmidt, 1984). Also, changes reported by counsellor trainees over their training have been not only in skill acquisition, but in higher-order constructs such as timing, choice of intervention, conceptualizing client problems, and counsellor/client interaction (Hirsch & Stone, 1982, 1983). Such findings have drawn researchers' attention towards examining possible mediational variables at work in counsellor skill development. Not much is known, though, about the process by which these higher-order skills develop. Hill, Charles and Reed (1981, p. 435) see it this way: "Although much has been written about how to do basic skills training, less has been written about how to teach the higher-order skills. Perhaps we know how to teach them but not how to communicate about the process."

In examining these influencing variables, however, a gap appears between observable counsellor processes and outcome behaviour. To account for this missing information a call has been made for the development of new research methodology (Hill et al, 1981; Howard, 1984; Polkinghorne, 1984; Schmidt, 1984). Martin (1984a) suggests that research from a cognitive-mediational perspective would help us understand more clearly the process of learning complex information about counselling. This new area in counselling research can be informed by theoretical and empirical work conducted in the broader area of education. For over a decade a cognitive-mediational approach has gained acceptance in research

on teacher effectiveness (Doyle, 1978; Winne, Marx & Walsh 1985). From an instructional perspective, foremost of interest is information **about** relationships between instructional conditions and learning outcomes. Moreover, in that a mediational mode provides a glimpse of the influencing variables between instructional conditions and outcome, this mode may be used to generate **prescriptive** procedures which may be used to monitor teacher behaviour **in the natural enviroment in which it occurs**, (ie. the classroom) (Cronbach, 1975; Doyle, 1978). This latter contribution is of particular importance in counselling because in more traditional research designs preserving the natural counselling environment and simultaneously monitoring the counselling has long been an obstacle.

This research focuses on the heart of counsellor education, that is, the training of novice counsellors. Of particular interest is the development of novice counsellor cognitive schema. An exploratory study is reported here using a cognitive-mediational design and a combination of quantitative and qualitative analysis procedures. The purpose of this study, then, is twofold. The first purpose is to expand our understanding of methodological possibilities in the area of cognitive-mediational research in counselling. The second is to investigate the cognitive schema of beginning counsellors.

CHAPTER II

LITERATURE REVIEW

In this section I survey the research on which the present study is based, and provide an integrative framework to link the areas these studies represent. As I review the different areas of research I focus on why it is important to study what counsellors are thinking.

Since its development as a formal discipline, counselling psychology has always been thought of as an inexact science (Polkinghorne, 1984). There are two main reasons for this claim. First, as an applied psychology, counselling psychology needs always to account for the ongoing and dynamic interactions between counsellor and client (Martin, 1984b; Polkinghorne, 1984). Second, and flowing directly from this shifting relationship, the counselling session is not an environment in which experimental controls can be exerted in the same way as they can in the laboratory. But if both the nature of the subject (a shifting and changing interaction) and the conditions in which it exists make it difficult to apply standard experimental criteria, then how can the data obtained in research on counselling be reliable and scientific? The challenge for counselling psychology researchers then, has been to try and create a method which will reconcile the demands of the counselling situation with the rigour of scientific investigation.

Counselling psychology researchers, in trying to discover how and why counselling works, have been forced to concentrate on gaining information from indirect sources. This has led the field of counselling psychology research in several directions. First, counselling psychologists have had to make do with theoretical concepts developed for other areas of psychology. Consequently, much of what is still being used in the practice of counselling psychology comes from an understanding of human behaviour as it has been refracted through scientific inquiry in experimental psychology (Lecomte, Dumont & Zingle, 1981; Polkinghorne, 1984). Second, counselling psychology researchers have focussed on the study of the more visible variables occurring in counselling sessions, (such as verbal exchanges, non-verbal behaviour, or verbal reports of counsellor or client thoughts) precisely because such variables are easily isolated for scientific inquiry (Martin, 1984b). There have been recent reports, however, that these variables may only represent part of the counselling process; that the internal processes of both the counsellor and the client are an important element in understanding counselling (Hirsch & Stone 1982; Martin, 1984b; Schmidt, 1984).

Increasingly, then, counselling psychology researchers have drawn on disciplines outside of the domain of psychology for information related to processes going on in counselling interactions. Research in the area of education, in particular, has been useful as it can be seen that the teacher/student relationship is, in some ways, similar to the relationship

between counsellor and client (Martin & Hiebert, 1985).

A Changing Paradigm

A certain amount of dissatisfaction with the use of methodologies adopted from the physical sciences as the sole meaningful framework for research in counselling psychology has resulted from recent shifts in epistomological thinking (Howard, 1984; Polkinghorne, 1984). The nature of this dissatisfaction seems based on the very objectivity of the experimental method and its categorization of the counsellor-client interaction as an object, while the clinical experiences of counsellors leads them to the conviction that they are engaged in an intersubjective exchange. The search then, is for a methodology that will be reliable without being too reductionist, and which will capture counselling psychologists' sense of the reality of the clinical situation.

Howard (1984) claims that traditional research methodology in psychology adopts the perspective of the researcher conducting the investigation and interpretation is made only within the boundaries set for the study. He argues, rather cautiously, that the various goals of science should be negotiable for a discipline and that perhaps the goals of research for the physical sciences may not be the same as those needed for counselling psychology research. Because of the personal and interactive nature of counselling, researchers taking an objective view of counselling may be missing important

"inside" information. What is needed in counselling research is a way to assess the more subjective processes going on in counselling sessions.

Polkinghorne (1984) believes that traditional research designs fail to answer the kinds of questions counselling psychologists ask. He reasons that, since people are not like subjects studied in other sciences, in studying the relationship between counsellor and client, we are studying the active participation of both persons. "Yet the research designs that are acceptable", Polkinghorne writes, "emphasize the passive and overt aspects of people - the empirically observable aspects. The designs seem incapable of explaining the everyday social behaviour of human beings that is actually experienced by counselling psychologists in their ongoing interactions with clients" (p. 422). Polkinghorne is supported by Martin (1984a) in his view that little research on behaviours observed in counselling sessions comes from ecologically sound settings. Moreover, behaviour itself is only an outsider's view of what is happening with a client or a counsellor. A central argument of this paper is that an understanding of counselling as an interactive and ongoing process will not advance until research data have been obtained about specific cognitive operations of clients and counsellors.

The debate over effective research methodologies in counselling psychology has surfaced and resurfaced for over a decade now. This debate has encouraged discussion on both the weaknesses of traditional statistical research paradigms in

counselling research, and the possibility of developing new paradigms that would better fit the particular needs of counselling research.

Cronbach (1975), in an article about psychology in general, questions the generalizability of data from studies employing traditional statistical methodologies (Scofield & Yoxtheimer, 1983; Snow, 1974). Generalizability, says Cronbach (1975), can be claimed by scientists only when using fixed and isolated conditions while experimenting. Moreover, generalizability in psychology has no **eternal** value, since even "empirical relations can change" (Cronbach, 1975, p. 122). In psychology, he continues, researchers are never free from past and present environmental and experiential influences. This interaction effect is continuously at work, thus acting to change any generalizations that can be built towards the proposal of a theory.

Snow (1974) in a similar vein, wrote "the biggest threat to external validity may come when the experiment does not fit the nature of the behaviour being studied and, furthermore, does not include the means of discovering this fact" (p. 265). In his 1974 article Snow claims, for instance, that even though methodological rigour requires that subject samples must be randomly chosen as well as randomly assigned to treatment groups, this very rarely happens. It certainly does not happpen to **any great degree** in counselling research (Scofield & Yoxtheimer, 1983), largely as a result of the individualized structure of counselling sessions and ethical restraints. It has

become evident then, that the research needs of counselling psychology are not entirely being met through the use of process-product paradigms.

Alternatives for a Changing Paradigm

Several research alternatives are offered in the literature. One suggestion (Howard, 1984), is to continue traditional research practices, but with the addition of one other dimension, that of hermeneutic research. Howard stresses that researchers must account for people's internal thinking processes as "important causal elements in the genesis of behaviour" (Howard, 1984, p. 431), that is, research must account for humans as **active agents**. This is much the same as the call for using a **subjective** view in counselling research that I mentioned earlier. Howard also believes that a person's life history profoundly influences that individual's behaviour, and he proposes a mix of single case studies and counselling analogue studies as the best way to combine an interpretive approach with traditional research designs. This is, in effect, a way of extending the boundaries of traditional process-product designs, but aims principally only to uncover a new understanding of counsellor characteristics and counselling effects data. It does not put researchers any closer to viewing the actual **processes** themselves.

Another way of interpreting Howard's (1984) suggestion (of adding an interpretive dimension to research) may be through the

use of **qualitative** research methods. Qualitative methods are directed at gaining "revelation and disclosure" (Van Maanen, Dabbs & Faulkner, 1982) rather than explanation and prediction. Qualitative strategies have a fundamental commitment to exploring subjective data and emphasis is placed on description of what is occurring in a given place at a given time. Generalizations are analytically induced rather than deduced through direct comparisons of variables.

Neimeyer and Resnikoff (1982) stated that although qualitative methods appear vague and imprecise, relative to quantitative research approaches they add a "richness, depth and complexity" (p. 76) to the studies they represent. Setting out to refute one common argument - that qualitative studies do not provide the means to generalize data - they suggest that qualitative techniques can provide as much generalizability as statistical techniques. For example, rather than rely on statistical sampling as the only means of representing a population, Neimeyer and Resnikoff believe that **theoretical sampling** can be a viable alternative. Theoretical sampling involves the use of participants with a set of clearly defined characteristics. Conclusions and generalizations then are applied only to that population, but of course, what "one learns from one situation can apply to other similar situations " (Neimeyer & Resnikoff, 1982, p. 78).

Another criticism of qualitative techniques, that they are unable to produce causal interpretations, is unrealistic say Neimeyer and Resnikoff. They claim that inferences can be drawn

if three criteria are met:

1) the researcher demonstrates **covariation** between relevant variables,

2) if the researcher shows **temporal succession**, ie. the cause preceeded the effect, and

3) if the reseacher can rule out **competing explanations**.

These conditions being met, the researcher is free to use analytic induction to draw inferences of causality. Neimeyer and Resnikoff suggest in short, that statistical measures of significance are not the only "scientific" way of achieving parsimonious explanations. Their belief is that a variety of qualitative methods are suitable for research on counsellor and client cognition, and they lean heavily, therefore, on those methods that allow researchers to account fully for the individual subjectivity (ie. the counsellor's own experience and the client's own experience) of the counselling process.

Another alternative in this methodological debate moves in a more radical direction than the previous possibilities. Polkinghorne (1984) calls for reconceptualizing research designs based solely on formal logic through a method of **systematic inquiry**. Briefly, systematic inquiry is an open, interacting system conducted within the context of the phenomena being investigated. Essential characteristics in the phenomena are approached through the interconnections within the unit of investigation rather than in the various parts. In counselling, Polkinghorne sees this as the study of human beings in much more active and functionally representative roles, and he develops

his research concept from the disciplines of linguistics,
anthropolgy and biology (Polkinghorne, 1984). Biology, with its
need to understand interacting communities of organisms was the
first discipline to use systematic methods of studying those
aspects of organism and systems which could not be accounted for
by merely analyzing constituent parts. Polkinghorne does not
reject information gained through the application of traditional
research paradigms; he merely questions their utility as the
sole method of investigating human interactions, and suggests
that not all of what there is to see surfaces from this
viewpoint. Polkinghorne admits, however, that research methods
in counselling psychology which take such "whole-systems"
perspective are not well developed, and he urges exploration and
development of methods from this alternative perspective.

One final strategy, is that of **quasi-representational**
research designs. Such a technique is particularly useful in
experimental conditions where full control of standard
procedures are not possible, such as in counselling. This method
follows the guidelines of traditional research, but adds certain
design features. Snow (1974) suggests the addition of these
features:

1) Embedding the experiment as unobtrusively as possible in the
flow of events, in the situation in which the experiment is
taking place.

2) For cases where complex treatments are found effective in at
least one context, taking a systematic replication approach
using successive omission of factors in further experiments,

3) The use of introspective and retrospective reporting to facilitate intra-experimental and extra-experimental observation, thus taking detailed account of participants' experience during an experiment.

Marx, Winne and Walsh (1985), in their explorations of student cognition during classroom learning, take a methodological approach similar to what Snow (1974) describes as quasi-representational design. Like Snow, they stress the need to corroborate theories of cognition relating to instructional variables. This can be done, they believe, from controlled contexts with data found in live classroom settings. They caution researchers who wish to use such designs, however, with the need for systematic investigations which "refine and validate the methodological properties [they propose]" (Marx, Winne, Walsh, 1985, p. 30).

It seems, then, that there is a move towards paradigmatic diversity in counselling psychology and related fields of research. What is also noticeable in all the research alternatives discussed above, is a call for the exploration of **internal** processes operating in counsellors and clients during counselling sessions. The opening up of previously strict research boundaries enables researchers to investigate counselling psychology from a cognitive perspective. In the next section I discuss two other fields of study that have moved couselling psychology toward taking a cognitive perspective in research.

Research on Counsellor Training as a Cognitive Activity

Over the last ten years an enormous amount of research effort has been spent on finding out what makes an effective counsellor. Effective counsellors appear to act intentionally in a way that is meaningful to clients so as to effect client change (Dell & Schmidt, 1976; Hill & O'Grady, 1985; Martin & Hiebert 1985). This research has resulted in lists of counsellor and client characteristics, behaviours and attitudes that are apparent when "effective" counselling is taking place (Scofield & Yoxtheimer, 1983). Although such data are important in creating a summary of overt counsellor and client interactions, they do not provide a picture of the internal cognitive structures underlying the display of these behaviours.

Blocher (1983) and Martin (1984a) have noted two emerging fields of study that are producing effects on the way in which counselling and counsellor training are conceptualized and conducted. These are the psychology of cognitive development and the psychology of instruction. Martin's (1984b) view is that counselling ought to be concerned with "processes and structures that underlie effective living and coping in a wide variety of life circumstances and with the design and arrangement of conditions under which such processes and structures can be acquired." (p. 29) While Martin draws attention to the need to advance our understanding of the processes and structures of cognitive systems, his statements are aimed at identifying the cognitive processes of and arranging learning conditions for

clients. Because beginning counsellors are likely to be in the same position, a learning role, as clients typically are in a counselling interaction, there is a need to be more aware of beginning counsellors' changing cognitive processes and learning needs. Having reached a similar conclusion to Martin's, Schmidt (1984) believes that research is needed which will investigate counsellors' ability to facilitate processes resulting in desired outcomes. With a greater understanding of the cognitive processes of beginning counsellors, and the demands placed on those processes, it may be possible to develop a more precise psychology of instruction, one geared toward building competent counsellors. Blocher (1983), espousing a similar view, tells how identifying the cognitive processes and structures affects the learning processes of counsellors themselves: "A basic assumption ...is that the optimal performance of a counseling psychologist involves a very high level of cognitive functioning" (p. 28). If the ultimate goal of counselling training is the acquisition of complex and comprehensive cognitive structures, then one must ask: How are novice counsellors prepared for this task?

Counselling as Information Processing

Blocher (1983) believes counsellors have to operate at a high level of cognitive functioning when working with clients. This includes, he says, the ability to understand, differentiate, integrate, and synthesize the perspectives of

people who hold a wide range of world views, while at the same
time collaborating with clients in the hope of imparting new
levels of skill and meaning. Wexler (1974) described counsellors
as "surrogate, or alternate organizers of the meaning of the
particular information the client is processing" (p. 94). Both
these statements imply that counsellors are processing much
information, perhaps on many different levels, when interacting
with clients.

Cognitive psychologists seem generally to agree that there
are three major systems in cognitive functioning. These are:
1)the sensory system, where information from the environment
enters the cognitive system, 2)the memory system, where
information is stored so it can be operated on by a variety of
cognitive processes, and 3) the response system, where
information is translated into behaviour (Anderson, 1970;
Martin, 1985b; Posner, 1978). A strong assumption in researchon
information processing is that people try to understand and
think about new information in terms of what they already know
(Martin, 1985b; Posner, 1978). Cognitive growth can be seen,
then, as a process of increasing differentiation and/or
integration of the information that is stored in the memory
system (Martin, 1985b; Posner, 1978). The information that is
stored in the memory and how this information is organized is
what is often referred to in the literature as cognitive **schema,
schemata, structure or process.** In this paper I use schema,
which I define as the organization or pattern of concepts
representing "knowledge" stored in the long term memory (Posner,

1978). Cognitive process is defined here as the interaction between the memory system and response system, resulting in behaviour. With significant advances in understanding the way counsellors' cognitve schema are structured and how schema develops it may become possible to see how changing schema are influenced by instruction and how to improve a learner's competence in these processes so that instructional procedures are more effectively employed and that counsellors may think about the counselling interaction systematically (Glaser, 1976; Martin, 1984b; Posner, 1978).

Evidence for the important role cogitive schema play in how a person perceives what he can do and how he thinks can be seen in Hirsch and Stone's (1983) experiment where they compared 27 doctoral-level counselling psychology students' conceptualizations of clients seen on tape with counselling experience and training. Their findings suggested that a high level of experience may

> lead to a cognitive capability (perhaps arising from a
> fund of knowledge and/or presence of elaborated
> cognitive schemas through which observations are given
> meaning) to identify salient aspects of a videotaped
> client quickly and to generate a conceptualization that
> accomodates these observations." (p.570)

In an earlier study, Hirsch and Stone (1982) taught 37 student volunteers how to use two counselling skills, reflection of feeling and interpretation. The volunteers' attitude toward using these skills was assessed and they were then allowed to conduct interviews with coached clients. Hirsch and Stone found that student volunteers with positive attitudes towards using

reflection of feeling produced significantly higher quality reflective responses than did volunteers with negative attitudes towards the use of this skill. No association between attitudes toward interpretive responses and quality of interpretation was found. The ability to use skills when instructed to do so was also monitored, and it was found, significantly, that the student volunteers could use the reflection of feeling skill when asked to do so, but were unable to mobilize the interpretation skill. Hirsch and Stone (1982) suggest that reflecting feeling is easier to learn than interpretation, as the latter requires a person to process more pieces of information than reflecting. Significant for the present research is the implication that these student volunteers did not posess a broad enough knowledge of counselling to use the skill they were taught successfully. Such a possibility points to the importance of considering the influence which information-processing factors have on a counsellor's ability to use counselling skills fluently, especially higher-order counselling skills.

Adding to this evidence, students taking counselling training have themselves reported experiencing difficulties in coming to terms with the cognitive changes they go through when learning to use higher-order counselling skills. In a study conducted by Hill, Charles & Reed (1981), 12 counselling students at the doctoral level were tracked during their first three years of training. Through two brief counselling sessions per year with volunteer clients, the students were measured on

their use of basic verbal counselling skills, anxiety and activity levels while counselling, and the quality of their use of the skills. A qualitative analysis was also done through a series of post-study interviews on how the students thought they themselves had changed as counsellors over the three years. Hill, Charles and Reed found that the students increased in their use of verbal counselling skills in an expected way, and that anxiety, activity and quality measures were at acceptable levels for students in a doctoral program. These changes were seen as minimal, however, when compared with changes the students made in the "more abstract and less operational higher-order abilities".

Other Methods Used to Gain Access to Cognitive Processes

As I have shown, researchers have become increasingly interested in monitoring the cognitions of the counsellor. To date, there has been little direct study of mediational influences as they occur naturally in a counselling session. However, there are a few studies on the cognitve processes in clients or counsellors. Methods such as questionnaires, memory probes to stimulate word associations, stimulated recall and the "think aloud" technique have been used. In instructional research on cognitive operations of teachers and students, methods such as process tracing, stimulated recall, and cognitive training have been used. A short descriptions of these research techniques follows.

From a mediational perspective Hirsch and Stone (1982)
explored the relationship between a specified set of attitudes
and counsellors' skill performance. Underlying this
investigation is the belief that if "prescribed skills are
behavioural expressions of underlying attitudes, a conflicting
set of prior attitudes might interfere with skill usage" (p.
516). They accordingly administered a questionnaire to the
student counsellors prior to the counselling session. As noted
earlier, Hirsch and Stone found that attitude **did** in fact have
an influence on the counsellors' use of the skills. Hirsch and
Stone discovered a mediational process at work. The use of a
questionnaire did not, however, allow for specific observation
of the **actual** cognitive process involved in this mediation.

Again, from a mediational perspective, in a single case
study Martin (1985a) used **memory probes** to obtain word
associations from a counselling client. The client arranged the
words in a pattern on a large paper according to how she thought
they were related to one another in her thoughts. Martin used
the memory probes twice, once at the beginning of counselling,
and agin eight sessions later. He noted changes in word
associations between the two times. Martin believes that such a
method captures some of the richness, complexity and highly
personal subjective meaning of the change process clients
experience from counselling. He suggests that this method
accesses client cognitive schema, demonstrating some of the
declaritive and conscious procedural knowledge of clients that
contributes to their cognitive competence. Martin states,

however, that this method is of limited value in accessing clients' metacognitive abilities.

Using a method called **stimulated recall**, Martin, Martin, Meyer and Slemon (1986) studied the relationships between counsellor and client cognition and behaviours. Immediately after a counselling session the client and the counsellor were interviewed separately. While viewing a videotape of the session, they were asked to recall what they were thinking or intending during a session at places where the videotape was halted. While Martin et al do not include matches for the variables of counsellor cognitive process and counsellor behaviour, they do present a massive amount of correlated variables, which include matches across counsellor and client intentions, cognitive processing, and behaviour. It was found that patterns across these correlations were lower for interpersonal cognition (ie. between counsellor and client) than for interpersonal behaviour or intrapersonal cognitive-behavioural links. This is an encouraging finding for the present research as it hints at the possibility of being able to track a relationship between intrapersonal cognitive and behavioural variables.

Teacher and student cognitive processes have been investigated in instructional research for over a decade. The methods used are valuable to review since they may be easily replicated in counselling research. **Process tracing** was used in a study by Peterson, Marx, and Clark (1978) and consisted of audiotaping teachers "thinking aloud" while they planned a

lesson they were going to teach. The "think aloud" statements were coded into nine planning categories. The plans the teachers made were then correlated to subsequent teaching behaviour and student achievement and attitude. Relevant to this research is a finding from Peterson et al, which showed a positive relationship between the cognitive level the teacher planned to use and the actual cognitve level of the discussion that took place during the teaching session. In their conclusion, the researchers state that the "think aloud" technique is only representative of one aspect of cognitive activity of the teachers, and that although teachers were asked to restrict their planning to the research session, planning may also have gone on outside the session. One disadvantage of the "think aloud" technique is that it would be difficult to implement during a teaching session as it would be too interruptive. Such a strategy might be used immediately before a counsellor met with a client to trace the cognitive planning the counsellor had done in preparation for the counselling session, but again, verbalizing a proposed strategy can lead to fresh insights; these would then be mobilized in the session, leading to a possible lack of fit between the reported plan, and the final implementation.

In **cognitive training** students are taught to distinguish instructional processes from actual learning, in an attempt to help them control their cognitive processing while they are learning. Winne and Marx (1980) used this method with university undergraduates in an attempt to remove variability in the

teaching of learning styles due to

1) learners not perceiving what is being taught,

2) learners inferring incorrectly what is being taught,

3) learners attending to and understanding what is being taught but choosing not to use it,

4) learners failing in their application of the learning process.

Winne and Marx failed to find results in support of their hypothesis that if learners were provided with a method of monitoring and changing their learning styles, they could learn more efficiently. In any event the method of cognitive training itself holds some interesting possibilities for beginning counsellors. Some comments made earlier by Blocher (1983) and Wexler (1974) showed the importance of identifying the learning processes of beginning counsellors, since they are required to learn to function at a very high cognitive level. With more research in cognitive training it may be possible to use this method as a means of teaching how to function at this cognitive level. Perhaps this method needs some more theoretical development to identify just what the levels of cognitive processes of "student counsellors" are.

The wide variability of results gained from studies employing these methods indicates that there probably are many levels of cognition to be found. Some of the methodological assumptions in these studies can also be faulted on the grounds that with similar methodological approaches to the study of cognitve processes, the research will be subject to the same

"blind spots". For example, several of the methods trace cognitive processing <u>after</u> counselling has taken place. Obviously it is less interfering for clients and counsellors to take part in the research portion of the counselling sessions outside the sessions. But one wonders about the effect of revisiting familiar territory and how much this influences participants' reports of ongoing cognitive processing. Verbal reporting itself has been criticized as an inaccurate measure, subject to faulty memory on the part of the participant, limited to the participant's command of the language, reactive to environmental influences, or as simply being too crude a method of gathering data (Fuqua, Johnson, Anderson, & Newman, 1984; Hollan & Bemis, 1981). Martin (1984b) suggests as a possible refinement that researchers keep the time interval between the end of a counselling session and the cognitive process assessment to a minimum. If this is done, and if researchers ask very directive and detailed questions about specific portions of the counselling session, then these weaknesses can be minimized. There remains the consideration, however, that perhaps it would be advantageous to explore other methodological strategies to see what different kinds of information arises and whether these data match data derived from personal reporting, or how they differ from some of the patterns already discovered.

To date, most of the data researchers have collected on cognitive process in counsellors or clients has been submitted from studies conducted within a process-product paradigm. Counselling psychology researchers, however, are beginning to

acknowledge the limiting view of cognitive process these data offer. New research paradigms that allow for the particular needs of counselling situations are being sought. Few researchers in counselling psychology have conducted research on counsellor and client cognitive processes outside of the process-product paradigm. What accounts for this? I believe that this dearth stems from having a poor choice of alternatives for methodological diversity. What is needed, then, is research that explores methodological alternatives.

Purpose of the Present Research

The central aim of the present research is to explore a new methodology for counselling process research. A technique for doing so was devised for this study based on previous work by Martin (1984b, 1985a, 1986). This technique, which measures relationships between novice counsellors' cognitive concepts regarding "counselling" in general, is untried, and thus constitutes the major exploratory portion of this study. The scope of the study has been kept purposely narrow, in order to concentrate on methodologcal considerations.

Counselling process research is undeveloped, resulting in little understanding of counsellors' cognitive processes, especially novice counsellors' cognitive processes. Through process-product studies, researchers have determined the existence of cognitive processes, or "mediational influences", but have been unable to describe or define cognitive process in

detail. In process-product paradigms, researchers have measured
concrete activities, such as counsellor or client behaviour, or
reports of intentions, to act as the **agent** with which to define
the presence of cognitive process. In such studies, however, the
agent is the primary factor of interest to researchers and the
presence of process is merely noted. In the context of the
present research, it is my goal to explore the **development** of
beginning counsellors' cognitive schema. Cognitive schema is a
large area to cover, and it would be unwise to study such a
broad concept using untried methodology. I have, therefore
broken down the concept of schema to examples of novice
counsellor cognitive schema **at two discreet points in time.** I
surmise that the schema of the novice counsellors will change
and this change will suggest that their schema is expanding.

Summary

Current interest in research on cognitive structure reflects
a change in how the process of counselling is viewed. Rather
than looking only at counsellor behaviour or studying
counselling outcomes, it has become increasingly important to
consider the development of counsellors' cognitive structure.
Consequently, it becomes necessary to identify new ways of
discovering these structures, as traditional methods of research
prove inadequate in dealing with this level of investigation.
Also encompassed in this move towards cognitive considerations
is a dissatisfaction expressed in the literature with

traditional scientific inquiry as the only acceptable and valuable means of gaining knowledge about counselling processes. There appears to be a desire to forgo some of the rigours tied to inquiry which uses physical science as a model, and to encourage in its place paradigmatic diversity. Whether this is only the current "Zeigeist", or whether advances in cognitive science have made this type of enquiry more possible, thus kindling a curiosity in exploring a more subjective level of human information processing is difficult to say.

CHAPTER III

METHODOLOGY

Sample

The Counsellors

Nine first year masters students in the Instructional
Psychology (counselling emphasis) program at Simon Fraser
University were asked to volunteer as participants for the
study. The nine counselling students were enrolled in their
first practicum course. No additional course credit or other
inducement was offered. All nine students agreed to participate
and signed consent forms outlining the basic time committment
and sequence of tasks involved in the study.

Of the nine graduate counselling students, six were female
and three were male. Two of the participants were between the
ages of 20 - 25, six were between 25 - 30 and one was between 30
- 35. Four of the students had an average of four years of
counselling experience working in social service agencies prior
to entering the counselling program. The type of counselling
included vocational, childcare, family, and drug and alcohol.
One student had five years of counselling-related experience,
i.e., teaching. Four of the students had an average of one year
of experience as volunteer counsellors. The type of counselling
included pastoral lay-counselling and working on a crisis line.
None of the counsellors had previous formal training at a post
secondary institution.

A required part of the Instructional Psychology (Counselling) master's program at Simon Fraser University is participation in two practicum courses. This first practicum course is taken after two pre-requisite courses - counselling theory, and counselling skills and strategies. The practicum is 13 weeks in length and counsellors must work at the practicum site 1 1/2 days a week, completing a minimum of 50 client-contact hours. Counsellors must also attend a five hour supervision seminar at the university once weekly for the duration of the practicum. The practicum is organized around attaining proficiency at using the skills and strategies covered in the pre-requisite course.

The practicum locations in this study included the counselling departments of two secondary schools, one mental health centre, the psychology department of a psychiatric institution, a family centre, and the Simon Fraser University counselling centre.

The Clients

The counselling sessions were conducted on site at the counselling students' praticum locations with the clients they were seeing during their practicums. Client problems dealt with included exam anxiety, interpersonal relationship problems, family relationship problems, low self-esteem, depression, panic attacks, and dealing with anger.

Each counselling session was 30 to 60 minutes in length. Clients were selected by the counsellor on a convenience basis.

Measures

One measure was employed in this study, the Cognitive Map Task. The Cognitive Map Task was used to gain access to the student counsellors' cognitive schema. This measure is explained below.

Cognitive Schema

The Cognitive Map Task consists of two sub-tasks. First, the counsellors each created a list of words about how clients change through counselling. Second, the counsellors each arranged the words from their lists (written on self-adhesive paper) on a laminated piece of 24 inch by 24 inch (10 by 10 to the inch) graph paper (called the map). One word at a time from the list was placed on the graph paper by the counsellor until all the words were placed. The arrangement of the words on the map and how they were connected was studied as a graphic representation of each student counsellor's cognitive schema regarding "counselling" in general.

Scoring

Each cognitive map was scored according to the procedure outlined below. It is easiest to explain using a simple example to work from.

Definition of Terms:

Map - Cognitive Map Task board

Point - Each sticker on the map is assigned a letter symbol and

is subsequently known as a "point".

Link - The connecting line drawn by counsellors between stickers.

Route - A possible path between a pair of points being considered made up of one or more links.
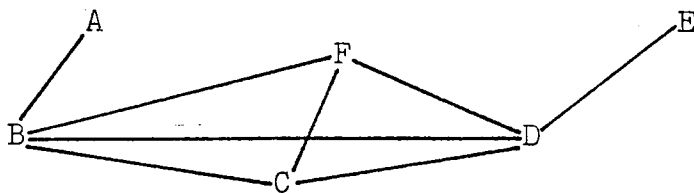
Example

In the above example, there are 4 routes between A and E. It is important that the same route not be counted **twice** thus A-B-F-C-D-E may be counted, but A-B-C-F-D-E may **not**, as the link between F and C has already been accounted for.

1. A-B-C-D-E

2. A-B-D-E

3. A-B-F-C-D-E

4. A-B-F-D-E

There is no direct route from A to E, as there is no connecting line, **or link**, between A and E. Further, there is no direct link between A and C, but, **there are 4 routes between A and C.**

1. A-B-C

2. A-B-F-C

3. A-B-F-D-C

4. A-B-D-C

Measure of association. A measure of association between pairs was obtained by counting the number of links between the pairs in all possible paths between two pairs. Each possible path is counted separately. The number of links is translated numerically into a fraction with the numerator as a constant (1) and the denominator as the number of links in that path. The association between two points is the sum of all such fractions where each fraction represents one route.

When scoring the above example, count the number of links on each route and construct the appropriate fraction.

1. A -B -C -D -E: 4 links, fraction = 1/4

2. A-B-D-E: 3 links, fraction = 1/3

3. A-B-F-C-D-E: 5 links, fraction = 1/5

4. A-B-F-D-E: 4 links, fraction = 1/4

Association between A and E:

Ass(A,E)= 1/4+1/3+1/5+1/4. Convert each fraction to a decimal and find the sum, so Ass(A,E)=.25 +.33 +.20 +.25 = 1.03

Similarily:

Ass(A,C)= 1/2+1/3+1/4+1/3 = 1.41

Looking at the example, point A appears closer to point C than A does to point E. Ass(A,C) has a stronger relationship than Ass(A,E). Ass(A,E) has a more encompassing, or broader relationship because there are more routes, or more **associations** between A,E than between A,C. Thus, it becomes evident that the

larger the sum, the stronger the relationship between points. The smaller the sum the more networking or association there is among points. When there is more interaction among points, however, this weakens the proximinal relationship between point pairs. Euclidian distance between two points is not isolated in this measure. The sums demonstrate an inverse measure of associaton among points.

Decision rules. In order to achieve consistency in interpreting possible ambiguous cases of association between two points, the following decision rules were used.

1) There are no "doublebacks", i.e., each route must be counted in one direction only, and any one point may not be passed through twice in the same route.

2) There is a ten link limit to each route - the relationship between points is considered too weak after ten links. Relationships that surpass a ten-link limit were counted only to the ten links.

3) For isolated points on the map from which participants have not drawn links, the numeric relation is automatically 1/0 (0).

4) If two points lie directly side by side (i.e., touching or almost touching) and there is no visible link drawn, they are interpreted as being on top of each other, and thus at the same place on the map. Each point is still assigned a letter symbol.

5) If a point is linked to a group of points, then the measure of association fraction will be the number of links **inside the group** (**not** pairwise links), plus the link from the point to the group (numerator) over the calculated measure of association for

the points inside the group (denominator). The single point is then paired with each point inside the group using this fraction.

Procedure

At the first meeting of the practicum seminar, each student counsellor generated his/her own list of words which would be used for the Cognitive Map Task. During the first three weeks of their practicum a counselling session was set up. Immediately before the counselling session I interviewed the counsellor and requested that they complete the Cognitive Map Task. When the task was complete I collected the map from the counsellor. This procedure was repeated in the same sequence for each counsellor during the last three weeks of the practicum, providing, therefore, two sets of data for each counsellor, one at the beginning and another at the end of the practicum. The exception to this sequence was the word list. The same word list that was created at the beginning of the practicum seminars was used for both Cognitive Map Tasks.

Word list. In the first meeting of the practicum seminar each counsellor was asked to make a list of 20 words in response to the instruction:

"Read the following question and then list the first 20 words that come to your mind.
What happens to help clients change during counselling?"

Not all counsellors wrote 20 words on their lists. The lists ranged from 8 to 23 words. For each list, the words were typed

onto individual stickers, thereby producing 9 sets of stickers (one set for each counsellor).

Cognitive map. At the practicum site, immediately before a counselling session took place, each counsellor arranged his or her words on a map. The rationale for having participants complete this task **before** beginning their counselling session was to capture a picture of the counsellors' cognitive schema regarding counselling in **general**, and to not have it contaminated by the content of the ensuing counselling session. For this part of the task, each counsellor received the set of stickers with his or her own words on them. They also received a sheet with the following instructions:

> Here are some stickers with words about counselling on them. Arrange these stickers on the Bristol Board in a manner that indicates how the concepts they represent are related in your thoughts. If two concepts are strongly related, place their stickers close to each other; if they are weakly related, place their stickers farther apart.
> Then, use a marker to draw connecting lines between the stickers that represent related concepts. You may rearrange stickers and lines until you are satisfied that what you have produced is a good representation of your understanding of these concepts and their relationships.

After these instructions were followed, a second sheet with further instructions was given to each counsellor:

> Finally, draw a circle around any clusters of concepts, i.e.,, concepts that seem to be part of some larger concept, and label each circle you have drawn.

Counsellors were given the same set of words for the map done at the beginning of the practicum, and the map done at the end of the practicum. Counsellors were not allowed to see their first map before completing their second map.

CHAPTER IV

RESULTS

This section is divided into two parts, each of which deals with a different analysis of the cognitive maps. The maps are first qualitatively analyzed through description, and then a quantitative analysis is applied, called multi-dimensional scaling; the multidimensional scaling results section includes a brief overview of the multidimensional scaling technique. The pressure of circumstances unfortunately prevented two of the counsellor volunteers from completing their assignments on time. Consequently, the data from the late assignments are not analyzed. The data presented in this section then, are for the seven counsellors who completed the tasks (i.e., both cognitive maps).

Descriptive Analysis of the Cognitive Map Task

To obtain the cognitive map results the maps were visually inspected and differences between the first and second maps were noted. The factors considered in this examination included the counsellors' placement of the words, the network of links between them, the counsellors' grouping of the words, and the overall shape of the groups of concepts. Refer to Figures 1 to 14 for reproductions of the actual maps.

In this section individual descriptions of the cognitive maps are given first, and then general comments regarding these analyses are made.

The following descriptions are given for each counsellor individually and include descriptions of the cognitive maps that each counsellor created. In the descriptions the map drawings will be referred to as the "map". Each word or concept on the map has been labelled with a letter to assist the reader in locating individual words on the maps. It is best to read the descriptions while referring to the maps.

Counsellor 1. Counsellor 1's map representations present a fairly linear shape of concepts. In map 1, there appears to be a wide distance between the cluster labelled "The Counselling Process" and the clusters called "Counsellor Behaviour and Client Growth", suggesting that in the mind of the counsellor the concepts included in these two clusters are not closely connected. "Counsellor Behaviour" includes only one concept. Perhaps the novice counsellor, with a small amount of practical counselling experience, has a limited idea of what counsellor behaviour consists of. In map 2, the distance between these clusters has lessened, and there is more of an interaction between the three clusters. "Counsellor Behaviour" now includes three concepts, and "Client Growth" has been given the new name of "Client Developmental Process", suggesting that the novice counsellor may now have a theoretical stance on what "Client Growth" is.

Counsellor 2. The concepts on map 2 appear to be more expanded than on map 1. There are three clusters in map 2, and only two clusters in map 1. The solitary points in map 1, that is, "D - client desire", and "A - correction of faulty

Figure 1. Cognitive map for counsellor 1, session 1

COUNSELLOR
BEHAVIOUR

instruction A

modelling B

learning C

practice D

motivation E

record-keeping F

positive regard G

self-acceptance H

selfless-ness I

maturation J

CLIENT GROWTH

THE COUNSELLING PROCESS

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Figure 2. Cognitive map for counsellor 1, session 2
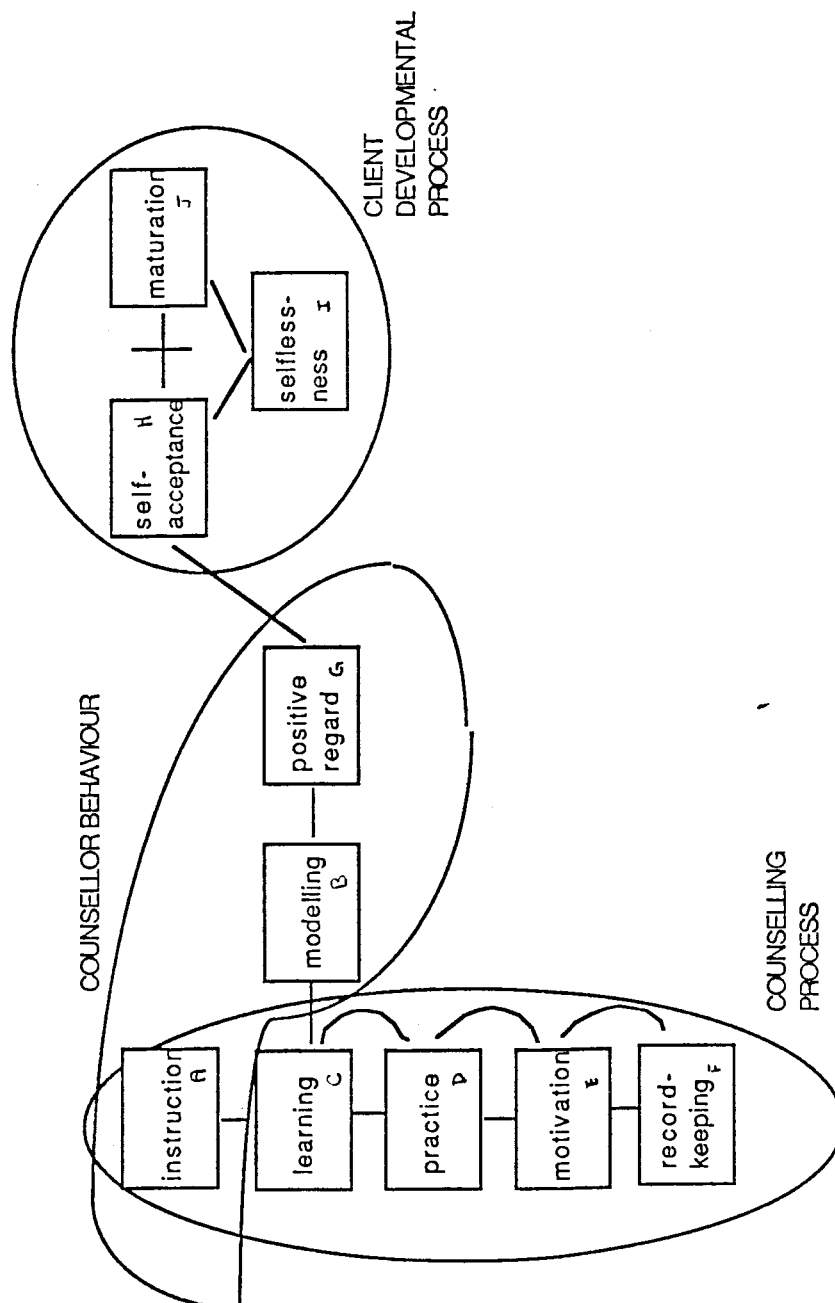
Figure 3. Cognitive map for counsellor 2, session 1
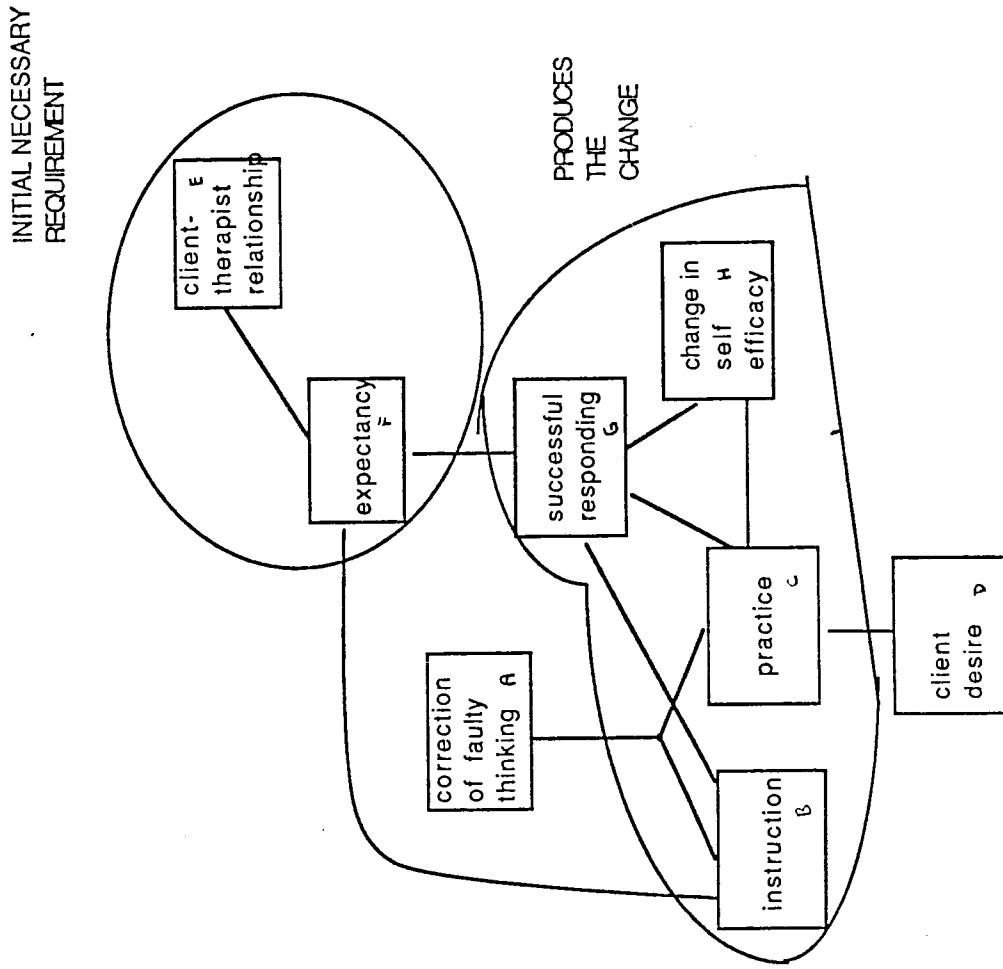
Figure 4. Cognitive map for counsellor2, session 2

ESSENTIAL PREREQUISITE

client-therapist relationship E

expectancy F

client desire D

successful responding G

change in self efficacy H

MORE ACCEPTABLE "HAPPY" LIFE SITUATION

correction of faulty thinking A

practice C

instruction B

THERAPEUTIC CHANGE

PROCESS

41

thinking", have been included in clusters in map 2. "Client
desire" is directly connected to "C - practice" in both maps. In
map 2, "A - correction of faulty thinking" seems to be part of 2
clusters. The "Produces the Change" cluster in map 1 has been
split and rearranged in map 2. The title in map 1, "Produces the
Change", has disappeared and instead three titles prevail -
"More Acceptable 'Happy' Life Situation", "Therapeutic Change",
and "Process".

Counsellor 3. For counsellor 3, map 1 appears to be the more
interactive map. This is different than what was found for the
other counsellors, where their second maps were usually more
interactive. There is a sense in counsellor 3's first map of
more interconnection and movement between the words, or points.
No titles have been assigned to any of the clusters. There are
three clusters in map 1, and two in map 2. Map 2 demonstrates a
more hierarchical, "one-step-at-a-time" arrangement, where each
concept seemingly leads into the next. In map 2, the concepts
appear to begin in the topmost cluster with planning words, for
example, "expectancy", "awareness", "contact". The second
cluster ends with words such as, "hang in there",
"follow-through", "fading" and "follow up". These words suggest
finishing, or the end of counselling. The solitary point
appearing in map 1, "I - structure", has been incorporated into
the topmost cluster in map 2.

Counsellor 4. Map 2 appears to have a hierarchical
structure, seen from the "pyramid" shape. The words seem to have
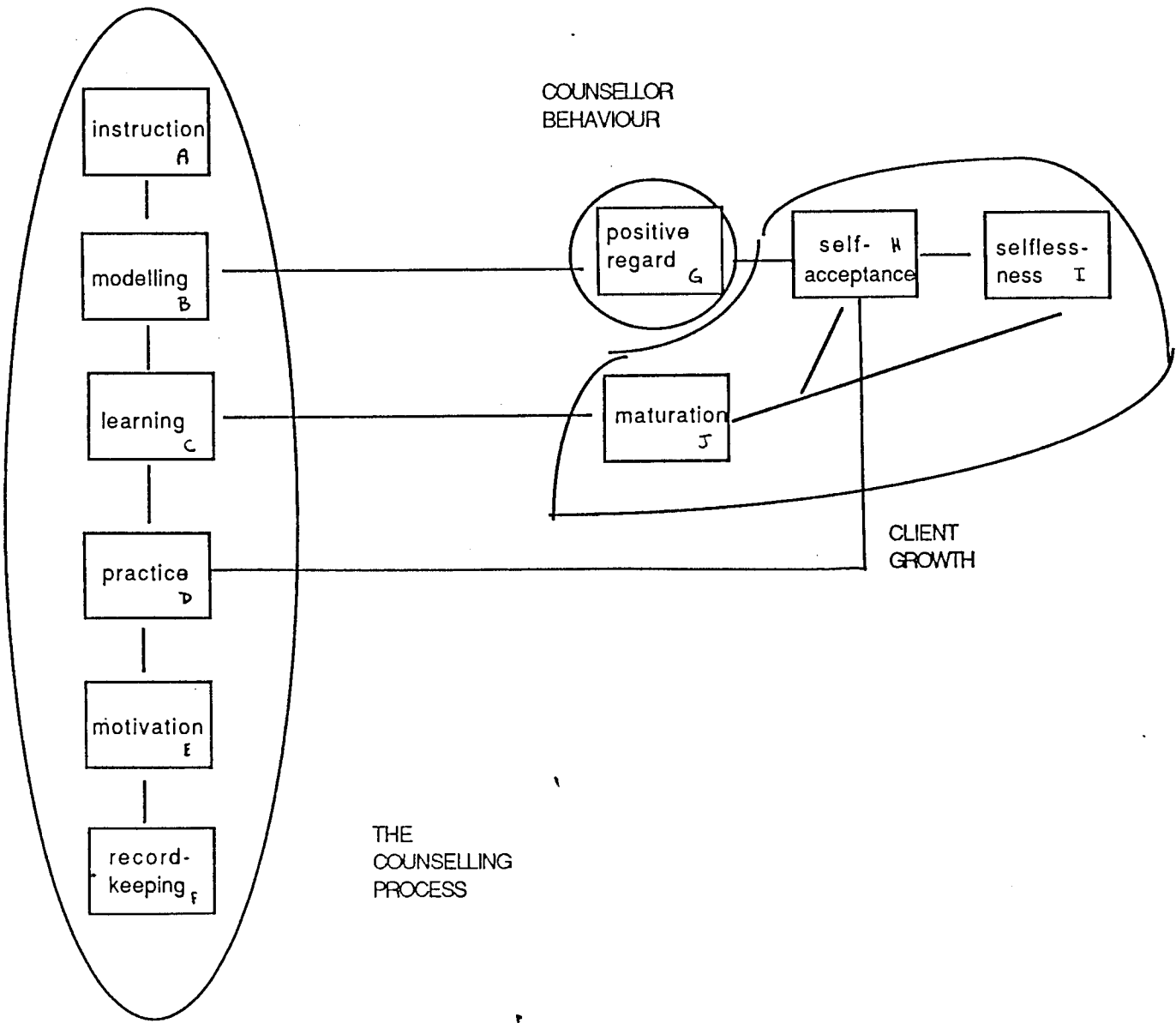a more definitive organization. For example, the cluster in map

Figure 5. Cognitive map for counsellor 3, session 1
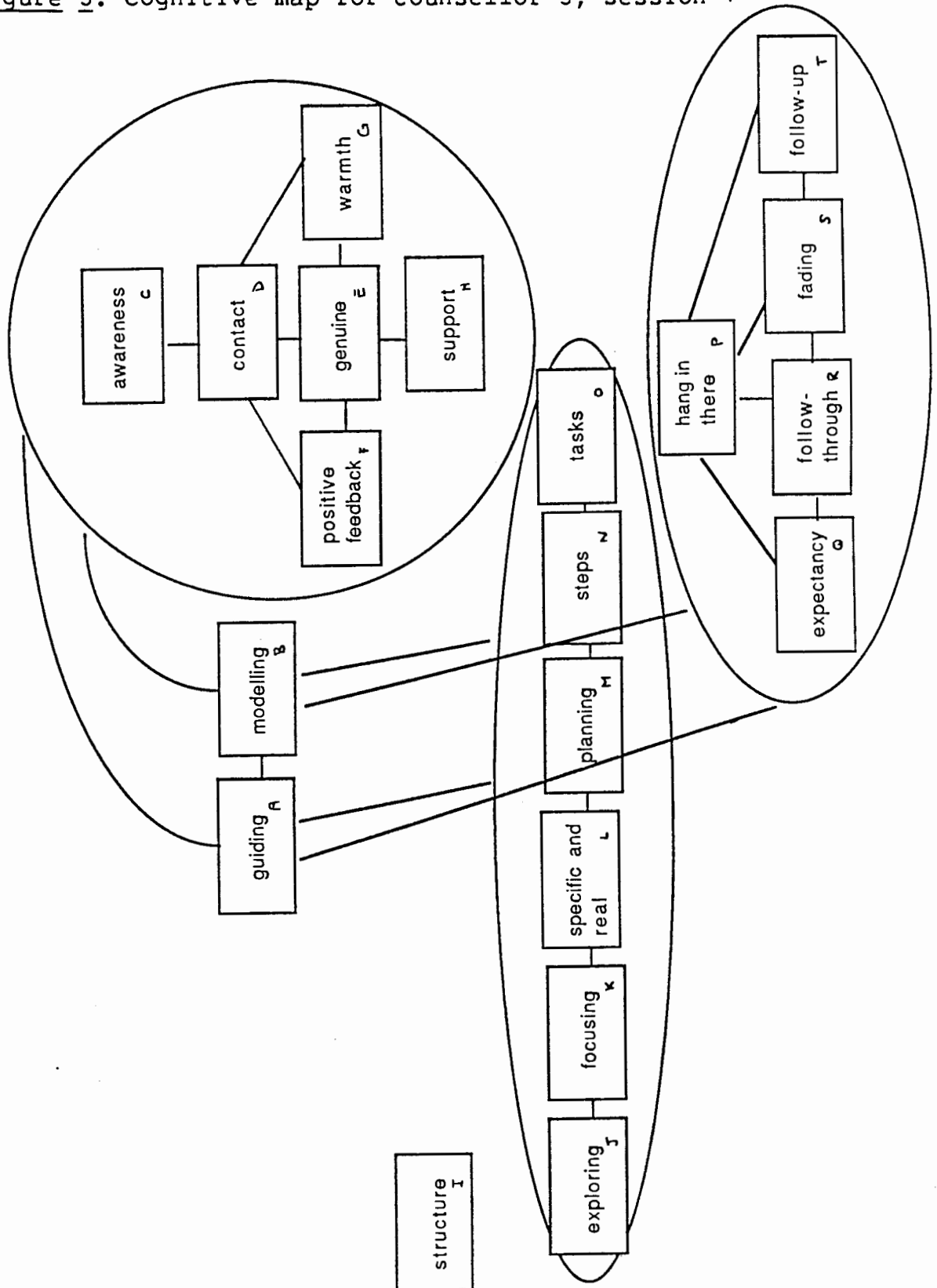
Figure 6. Cognitive map for counsellor 3, session 2
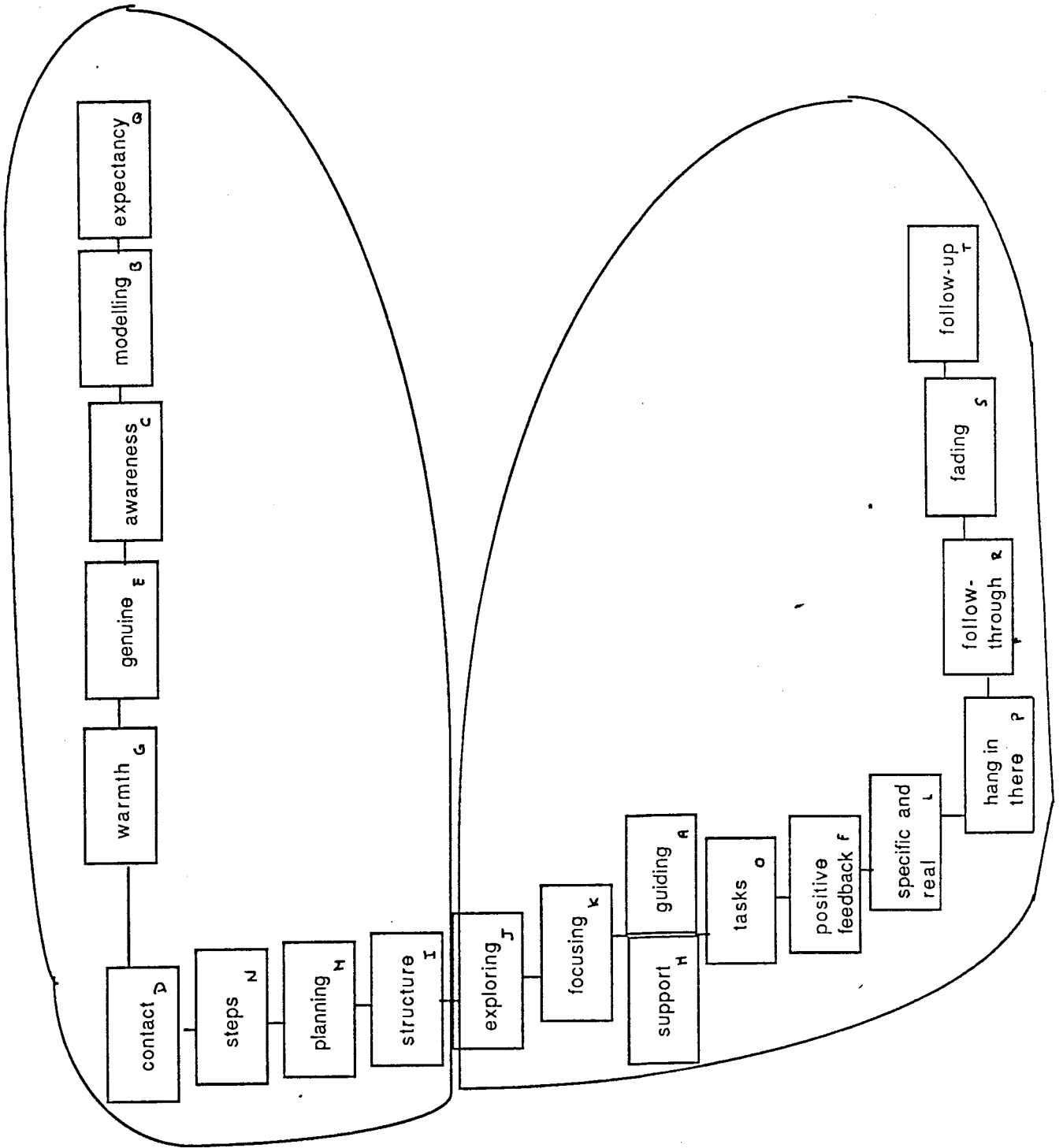
Figure 7. Cognitive map for counsellor 4, session 1
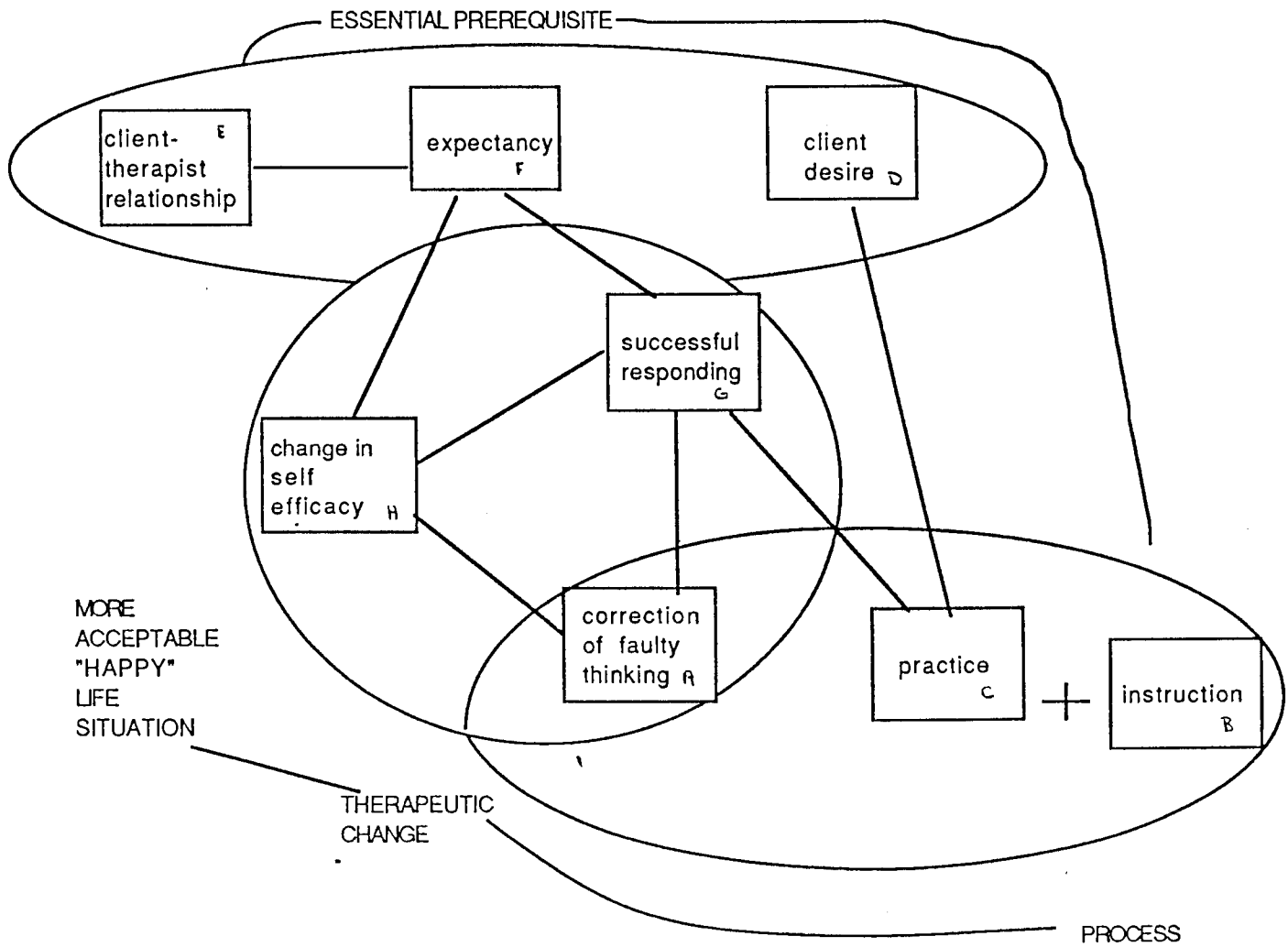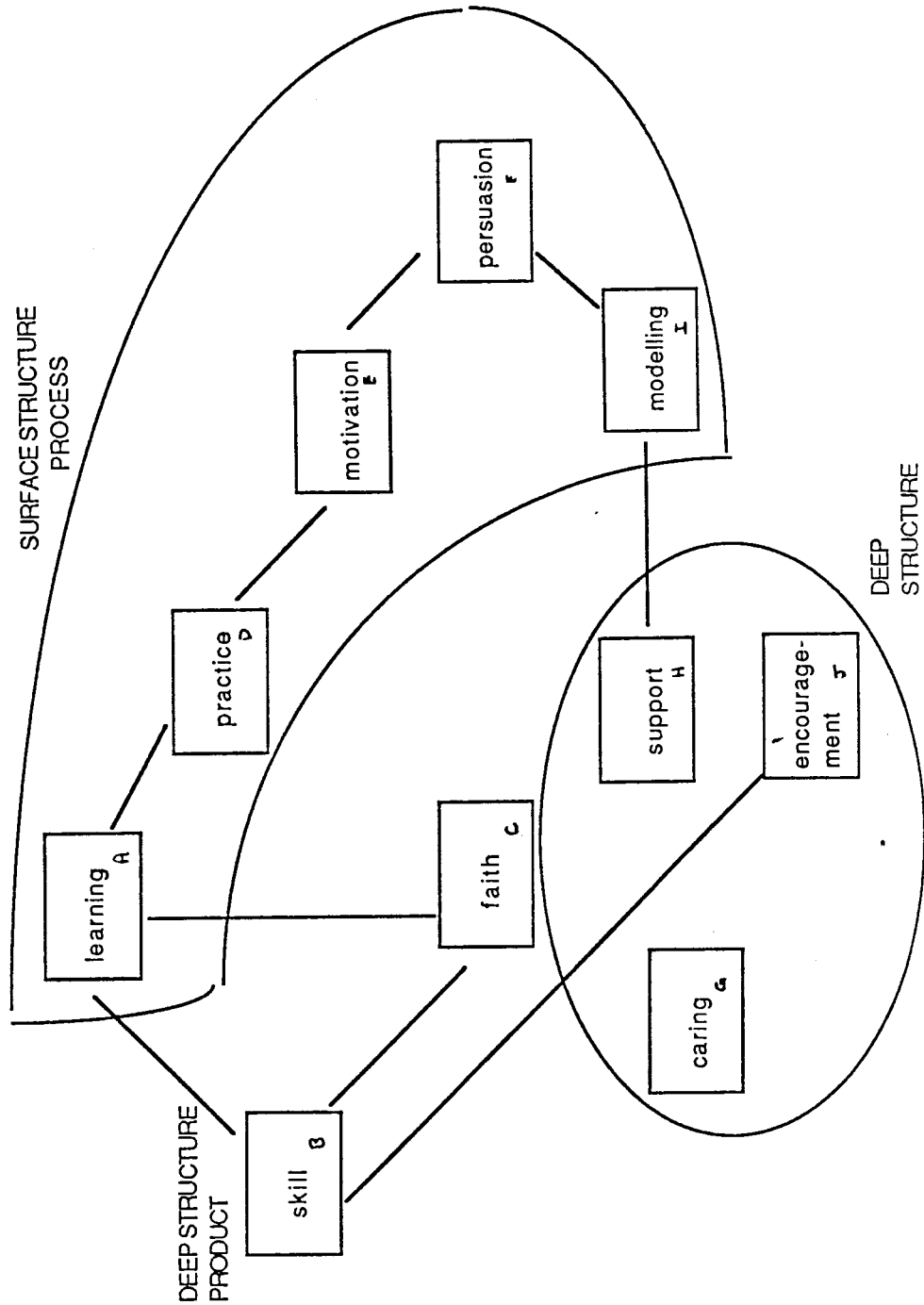
Figure 8. Cognitive map for counsellor 4, session 2
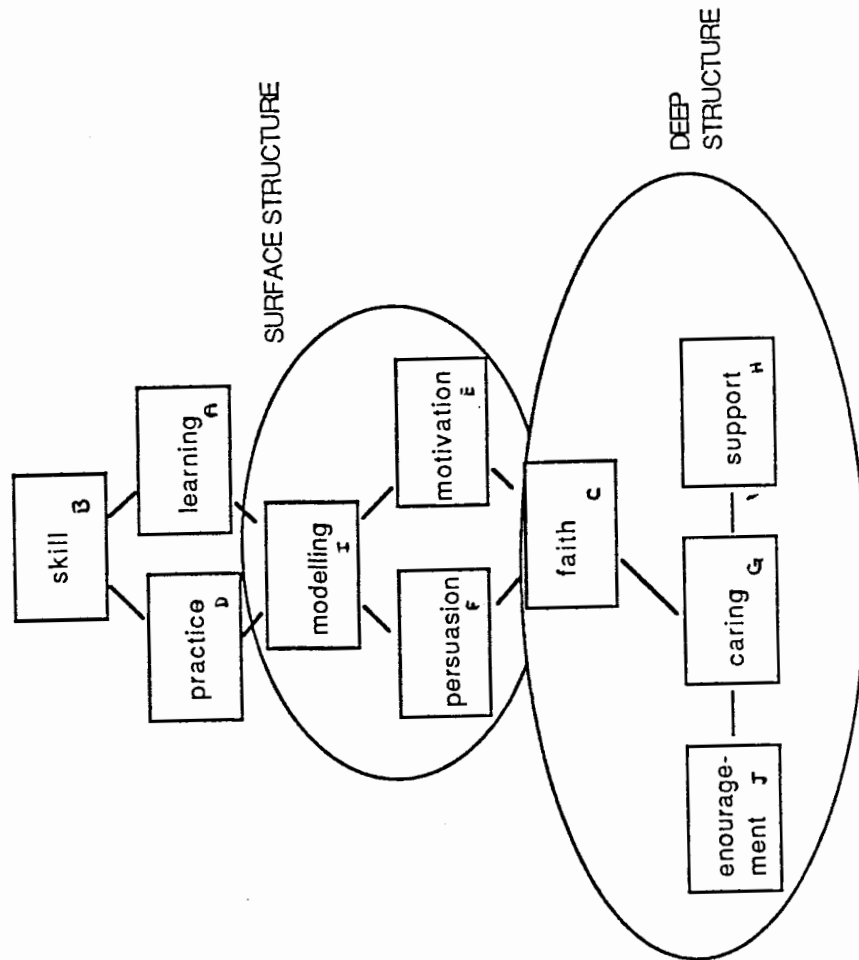
1, "Surface Structure Process" is scattered across the page, but organized and modular in map 2. "B - skill" in map 1, is connected to "A - learning", "J - encouragement", and "C - faith". In map 2, "skill" is connected to "D - practice", and "learning", and rather than being titled "Deep Structure Product", it has become the premier focus in map 2, at the top of the pyramid. As a cluster "Deep Structure" in map 1 is comprised of "G - caring", "H - support", and "J - encouragement", but these words are not actually linked by drawn lines. In map 2 these same words have remained in a cluster, but are now connected, and "C - faith" has been added to the cluster.

Counsellor 5. Counsellor 5's map was drawn atypically if compared to most of the other counsellors' maps, in the sense that in map 1 the words interact within their clusters, but none of the clusters connect. In map 2 intercluster connection is evident. Moreover, within their clusters each word is directly connected to every other word, for both maps. This seems to show that the counsellor has not differentiated the concepts into any kind of relatedness hierarchy, but that all the words are equally related to each other. The labels given the clusters differ from map 1 to map 2, except for the cluster "Counsellor/Client Relationship". The words in this cluster have remained the same, except for the addition of "P - regular contact" in map 2. "Regular contact" was left as a solitary point in map 1. The cluster in map 1 labelled "Meaningful Goals" has been split in map 2 into two new clusters. "F - goals", "H -

accessibility" and "K - clear focus" have been placed in a group
by themselves, labelled "Focus". "G - increments", "I -
expectancy" and "J - desire to change" have been placed in a
cluster labelled "Attitudes/Activities". The "Rehearsal" cluster
in map 1 has been added to "Attitudes/Activities" in map 2. The
cluster labelled "Behaviour/Change/Reinforcement" in map 1 has
remained the same in map 2, but is re-named "Consequences". "Q -
follow-up" remains a solitary point on both map's, although in
map 2 it is associated with the cluster labelled "Focus".

Counsellor 6. Map 1 seems quite cluttered, with clusters
having been drawn on top of each other. There is little
connection between the clusters, except for "K - change in
perspective", which appears as a central concept in both map's.
In map 2 "change in persective" is also closely associated with
"A - awareness". Map 2 is less cluttered. The number of clusters
has been reduced from five to three. The words in the clusters
appear to have been substantially rearranged, except for the
"Learning/Feedback Paradigm" cluster in map 1, and "Learning
Paradigm, Formula for Change" in map 2. These two clusters both
include "B - learning", "I - feedback", and "J - expression". In
map 2 "A - awareness" has been changed for "L - structure".

Counsellor 7. Map 1 is, essentially, very simple. It
consists of one cluster and three outliers. The outliers are 'A
- context of problem", "D - willingness-influence", "H - sense
of growth". "A - context of problem" and "H - sense of growth"
are related to the group of concepts inside the circle, while "D
- willingness-influence" is linked directly to "C -

Figure 9. Cognitive map for counsellor 5, session 1

FOCUS

goals F

clear focus K

accessibility H

COUNSELLOR/CLIENT
RELATIONSHIP

trust B

warmth C

rapport A

support E

encouragement D

regular contact P

ATTITUDES/ACTIVITIES

desire to change J

expectancy I

modelling L

covert practice M

increments G

consequences N

reward O

CONSEQUENCES

follow-up a

50
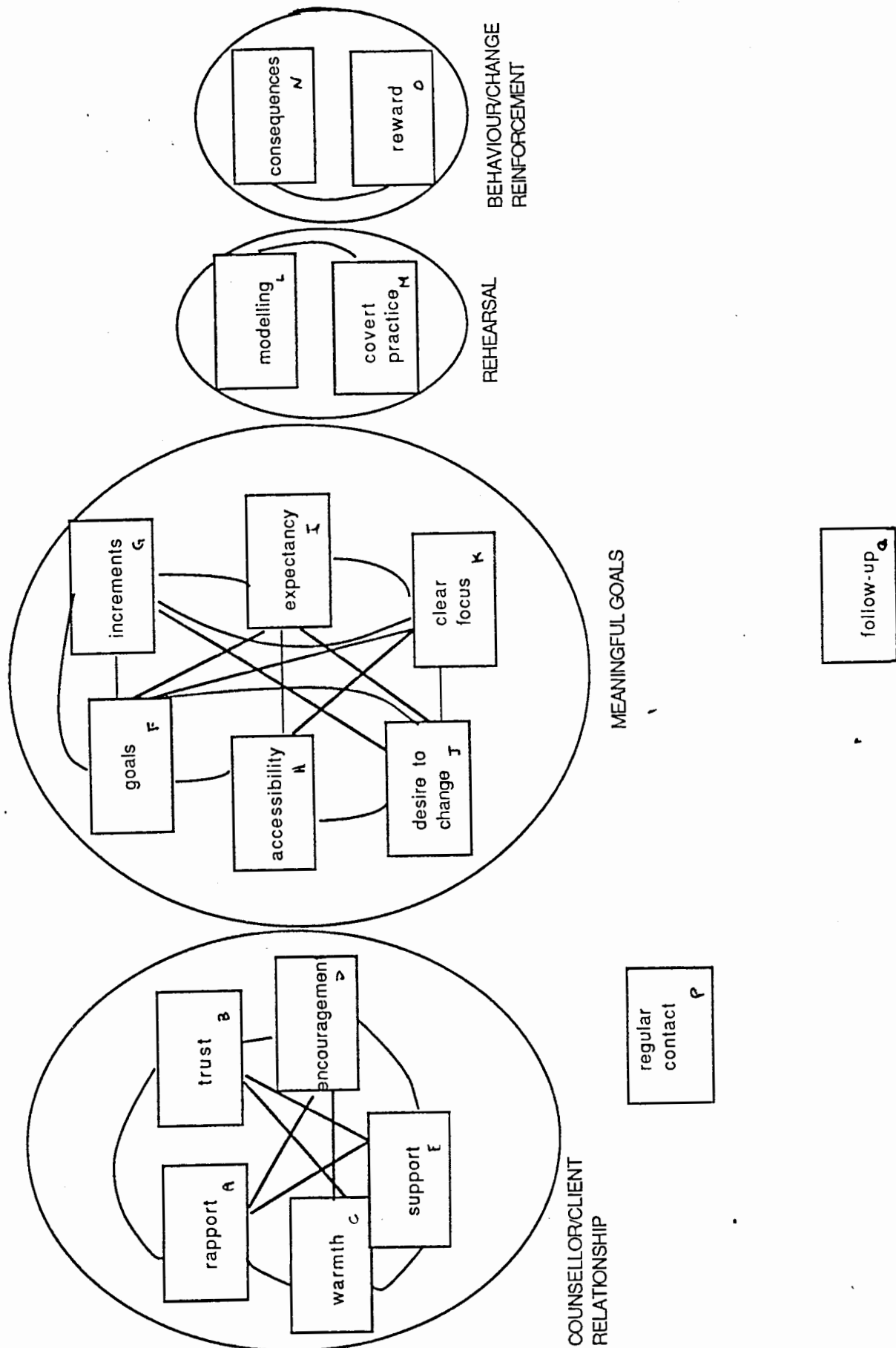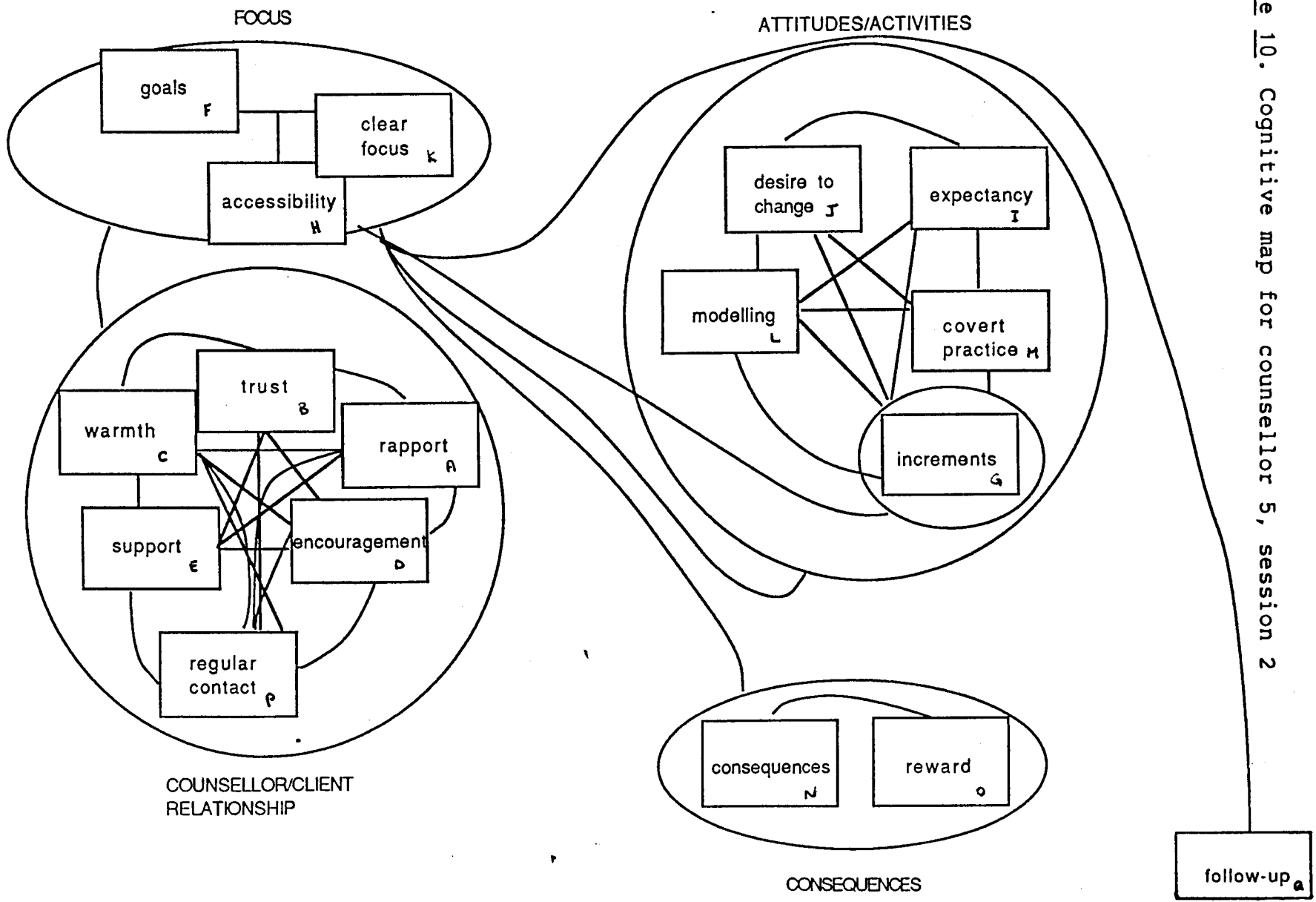
Figure 10. Cognitive map for counsellor 5, session 2

EVOLUTION/
CLIENT-CENTRED

PERSONAL
INFLUENCE MODEL

LEARNING/
FEEDBACK
PARADIGM

non-
judgement   D

relaxation   E

persuasion   C

rapport   F

comfort   H

learning   B

support   G

awareness   A

feedback   I

change in
perspective   K

structure   L

MEANING PARADIGM

expression   J

expectation   N

intimacy   M

optimism   O

TRANSFORMATION
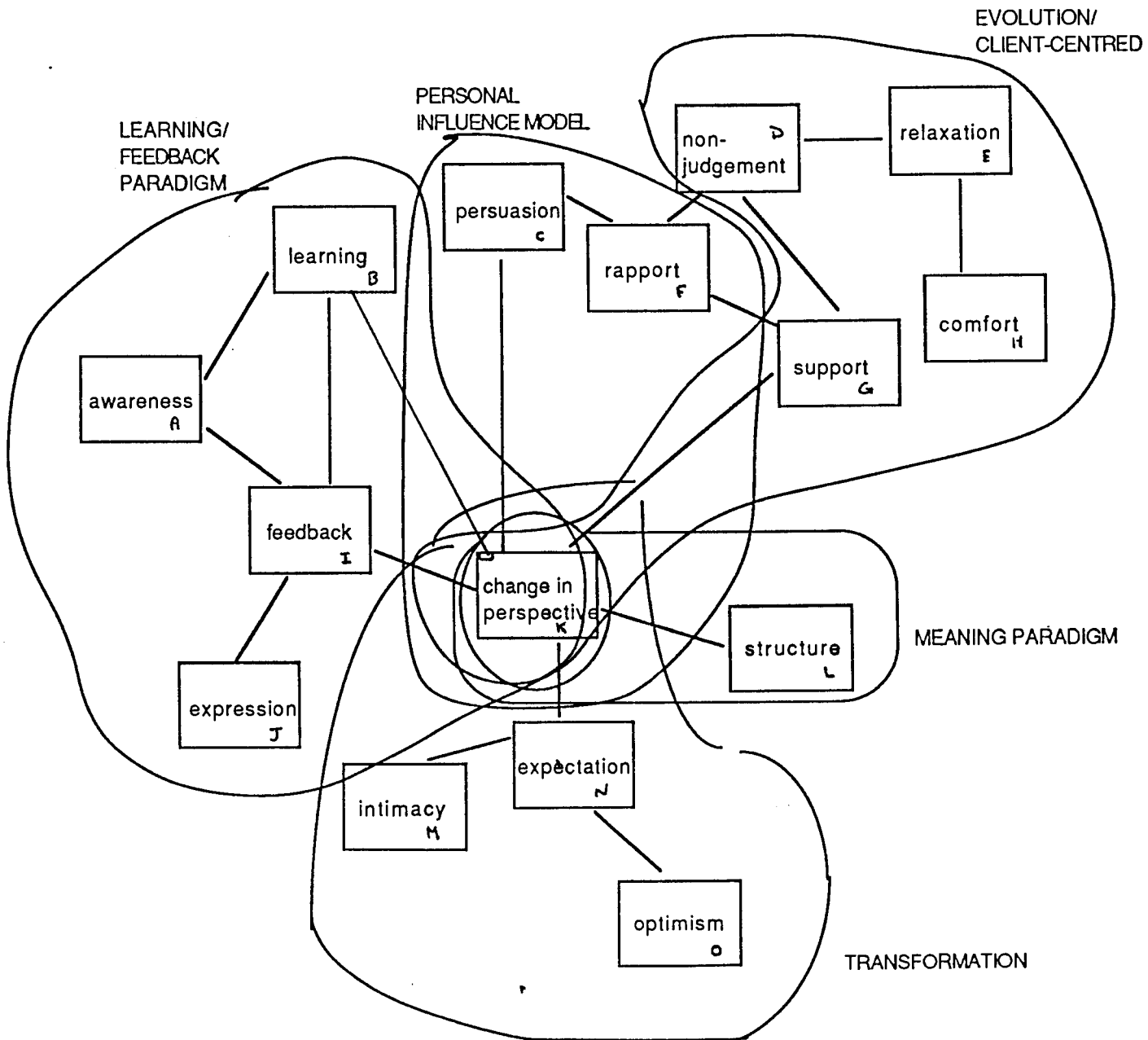
Figure 11. Cognitive map for counsellor 6, session 1

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Figure 12. Cognitive map for counsellor 6, session 2
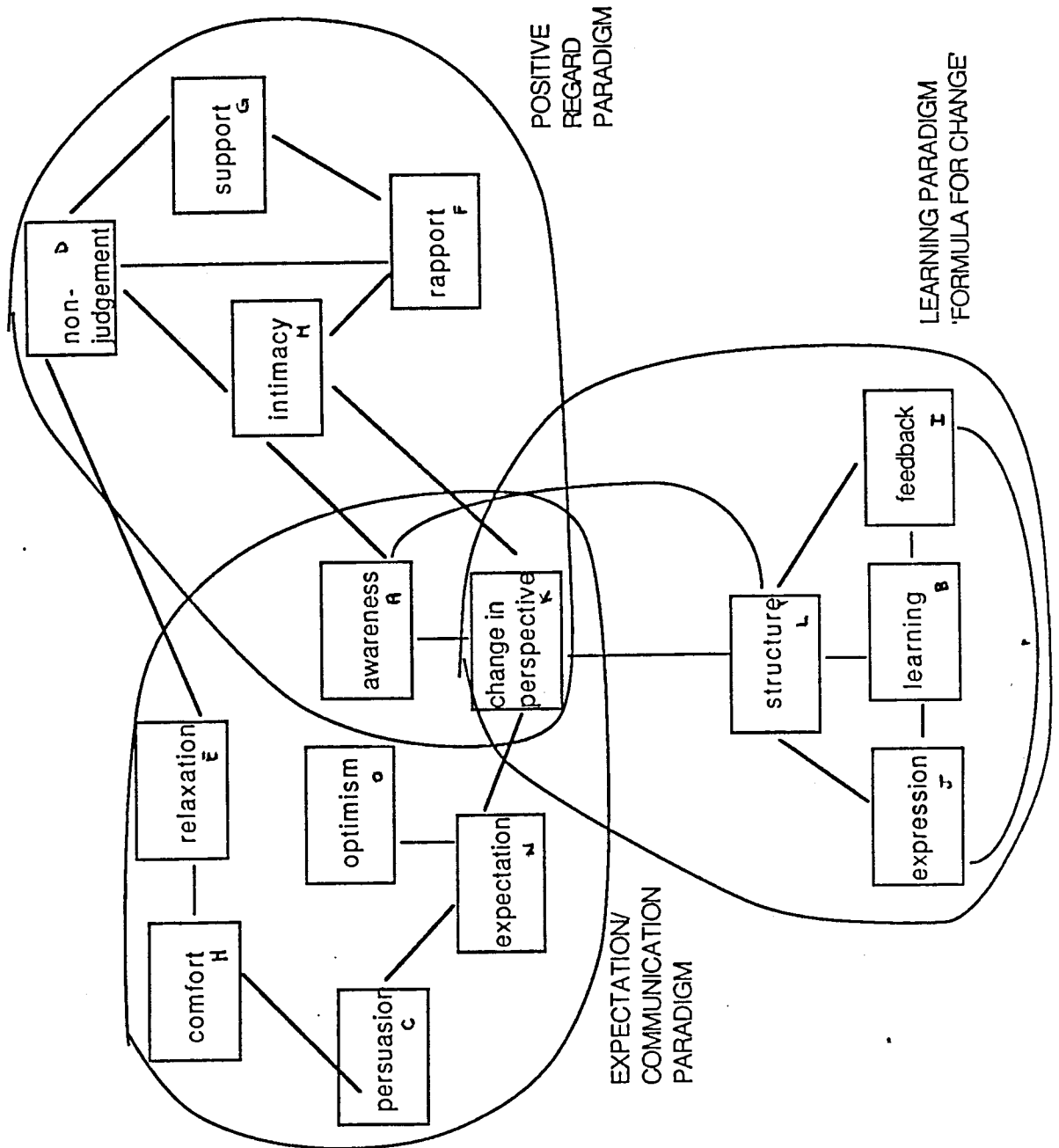
relationship". There was no title assigned to the cluster. In map 2 the diagram has expanded to 4 clusters, with titles. The outliers from map 1 have been incorporated into clusters, with "A - context of problem" in the cluster labelled "Issues - Subject Matter", "willingness-influence" in the clustered labelled "Critical Premise", and "sense of growth" in the cluster "Outcome".

General Comments about Map Descriptions

For counsellors 1, 2, 5, 6 and 7 the second cognitive maps appear more interactive. There is more interlinking between the words and groups of words do not seem as segregated as they do on the first cognitive maps. Moreover, most solitary points have become part of a group. For counsellors 3 and 4, however, the opposite seems to have occurred. The networking on their first maps appears interactive, even disorganized. The second maps have more of a definitive structure to them. Both counsellors 3 and 4 are more experienced, while counsellors 1, 2, 5, 6 and 7 are a mixture of less experienced and more experienced.

The **association**, or networks of linked words on the second cognitive maps have been rearranged, although some of the chains on the second maps include the same words as they did on the first maps. Considering that there were ten weeks between task times, it is surprising how similar some of the networks are, even if their relative positions have been rearranged. This is consistent over all the counsellors. On the session 1 maps,

Figure 13. Cognitive map for counsellor 7, session 1
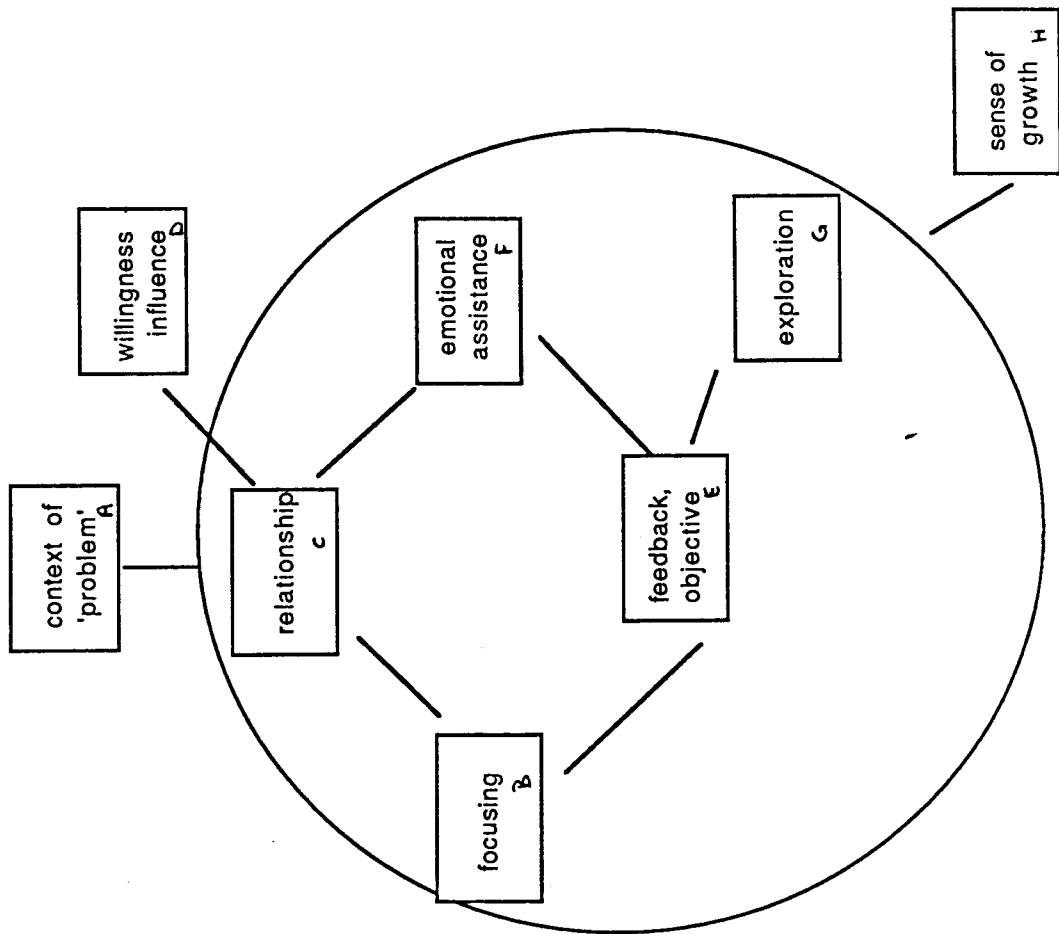
Figure 14. Cognitive map for counsellor 7, session 2
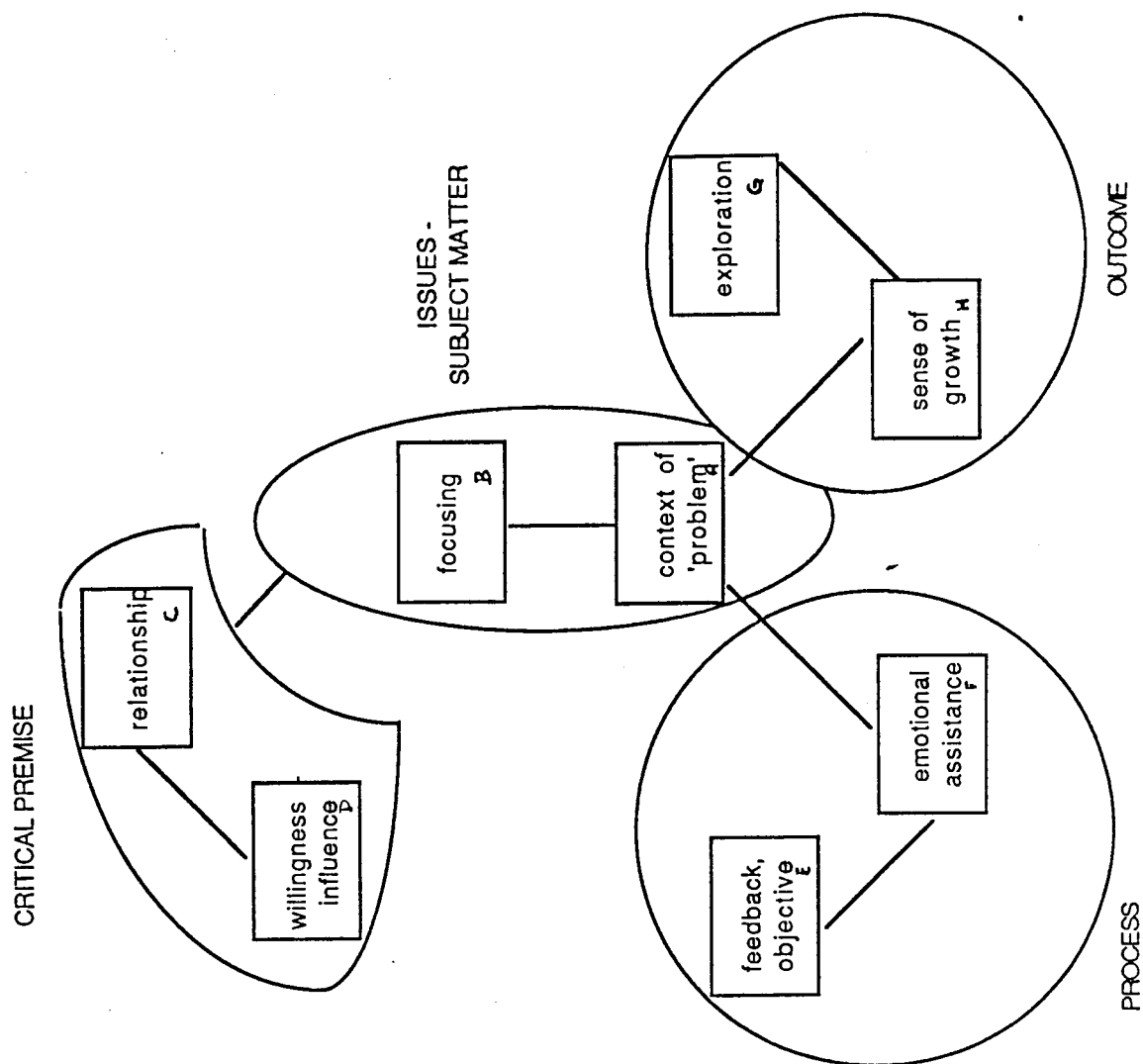
there are numerous "isolated" words. Some of these words are in a group by themselves (e.g., see counsellor 1, map 1 - "positive regard"), or not in any group (e.g., see counsellor 2, map 1 - "correction of faulty thinking"), or unattached to any other words (e.g., see counsellor 3, map 1 - "structure").

The concepts in session 2 cognitive maps appear more integrated. Almost all words are part of a larger group or structure. One exception is "follow-up" on counsellor 5, map 2. These changes suggest a fluidity to the maps that is absent in the first map.

Many of the counsellors commented while performing the second cognitive map task that they felt restricted in having to use the same list of words again. These counsellors stated that they had many new words related to counselling that they could put on the map.

Finally, it is also interesting to note that all 3 of the less experienced counsellors had lists of 10 or fewer words. Three out of 4 more experienced counsellors had lists of 15 or more words, while one out of the 4 more experienced counsellors had 8 words. This suggests that when creating the word lists, the more experienced counsellors were able to generate more concepts about the counselling process in general.

Multi-dimensional Scaling Results

The raw measure of association data originating from the maps were subjected to a non-metric **multi-dimensional scaling (MDS)** analysis with the ALSCAL program. This technique is to discover whether the measure of association designed for this study produced quantitatively interpretable relationships between point pairs on the maps. See Tables 1 to 14 for the multi-dimensional scatterplot configurations of the cognitive maps.

Description of the Multi-Dimensional Scaling Technique

MDS is an exploratory, descriptive statistical technique that helps researchers find patterns or structures in a data set. MDS can measure **similarities or dissimilarities** between objects in a data set. These similarities or dissimilarities can be obtained from measures of relatedness, association, preferences, dependence, or complementarity between objects. In this study the words, or points on the maps are viewed as the objects. The most common way an MDS analysis is demonstrated is on a scatterplot. The scatterplot consists of a geometric configuration of points. Each point on the plot represents one of the objects from the data set. Kruskal and Wish (1978) describe this configuration as reflecting the "hidden structure in the data, [which] often makes the data much easier to comprehend" (p. 7). Interpretation of this configuration can consist of identifying important stimulus groupings and

Table 1: <u>Multi-dimensional</u> <u>scatterplot</u> <u>for</u> <u>counsellor</u> <u>1,</u> <u>session</u> <u>i</u>
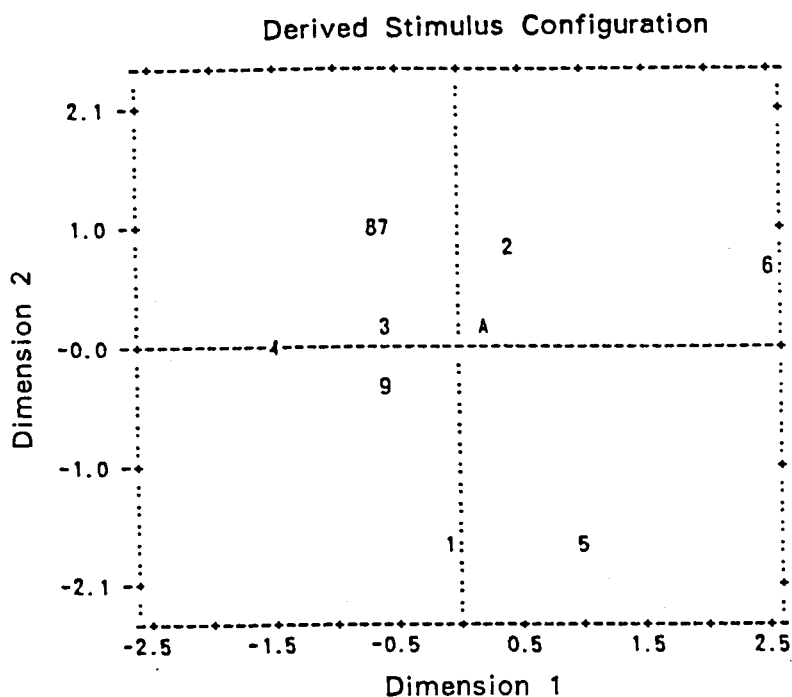
Derived Stimulus Configuration

```
      2.1 -+                     :                    +
            :                    :                    :
            :                    :                    :
            :                    :                    :
      1.0 -+        87           :    2               +
            :                    :                  6:
Dimension 2 :                    :                    :
      -0.0 -+----4          3    : A -----------------+
            :                    :                    :
            :             9      :                    :
            :                    :                    :
     -1.0 -+                     :                    +
            :                    :                    :
            :                    :                    :
            :             1:        5                 :
            :                    :                    :
     -2.1 -+                     :                    +
            +----+----+----+----+----+----+----+----+
          -2.5   -1.5   -0.5    0.5    1.5    2.5
                        Dimension 1
```

Legend

Stimulus Coordinates

Concept Name	Plot Symbol	Dimension 1	Dimension 2
instruction	1	-0.125	-1.668
modelling	2	0.396	0.822
learning	3	-0.579	0.136
practice	4	-1.531	-0.025
motivation	5	1.023	-1.646
record-keeping	6	2.499	0.641
positive regard	7	-0.552	1.004
self-acceptance	8	-0.659	0.970
selflessness	9	-0.623	-0.376
maturation	A	0.152	0.141

Table 2: <u>Multi-dimensional scatterplot for counsellor 1, session</u>
<u>2</u>
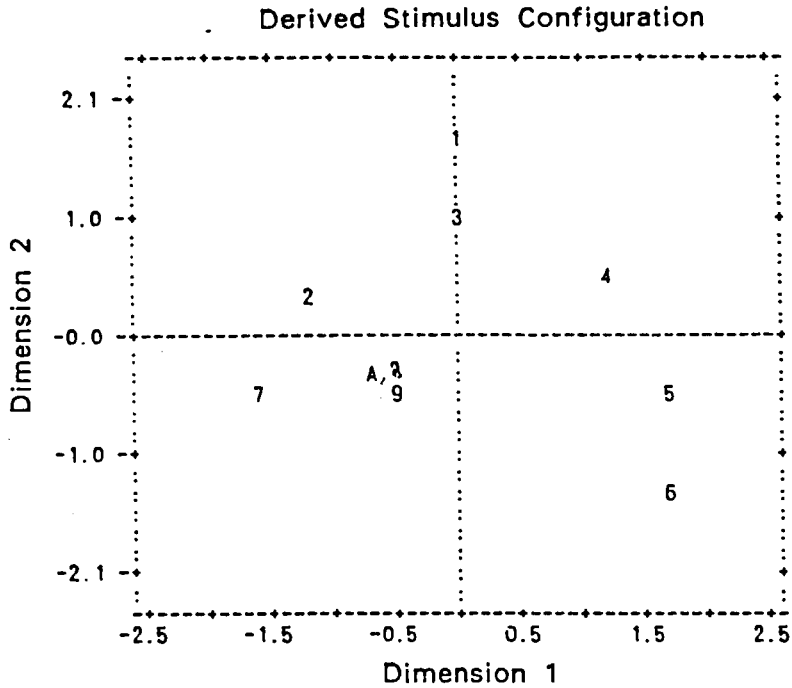
Derived Stimulus Configuration

Legend

Stimulus Coordinates

Concept Name	Plot Symbol	Dimension 1	Dimension 2
instruction	1	0.015	1.814
modelling	2	-1.177	0.299
learning	3	-0.028	0.990
practice	4	1.237	0.594
motivation	5	1.691	-0.505
record keeping	6	1.702	-1.333
positive regard	7	-1.594	-0.596
self-acceptance	8	-0.657	-0.388
selflessness	9	-0.532	-0.485
maturation	A	-0.657	-0.389

Table 3: <u>Multi-dimensional</u> <u>scatterplot</u> <u>for</u> <u>counsellor</u> 2, <u>session</u>
<u>1</u>

Derived Stimulus Configuration

```
         2.1 -+                    4   :
              :                        :
              :                        :
         1.0 -+                        :
   D          :                        :
   i          :                    1   :
   m          :                        :
   e    -0.0 -+------------------------:-------------------
   n          :                    2   :
   s          :                    7   :
   i          :                    8  3  6
   o          :                        :
   n    -1.0 -+  :5                     :
              :                        :
   2          :                        :
        -2.1 -+                        :
              :                        :
            -2.5   -1.5   -0.5   0.5   1.5   2.5
                      Dimension 1
```

Legend

Stimulus Coordinates

Concept Name	Plot Symbol	Dimension 1	Dimension 2
correction of faulty	1	0.164	0.559
instruction	2	0.405	-0.158
practice	3	0.405	-0.688
client desire	4	-0.320	2.421
client/therapist rela	5	-2.527	-0.816
expectancy	6	0.793	-0.497
successful responding	7	0.428	-0.377
change in self effica	8	0.425	-0.446

Table 4: <u>Multi-dimensional</u> <u>scatterplot</u> <u>for</u> <u>counsellor</u> <u>2, session</u>
<u>2</u>

Derived Stimulus Configuration

Legend

Stimulus Coordinates

Concept Name	Plot Symbol	Dimension 1	Dimension 2
correction of faulty	1	2.430	-0.546
instruction	2	-0.952	1.546
practice	3	-1.365	-0.737
client desire	4	-1.573	0.342
client/therapist rela	5	0.125	-1.177
expectancy	6	0.285	0.473
successful responding	7	0.722	0.266
change in self effica	8	0.328	0.171

describing how they correspond to: a) one another on the plot, and b) to the original objects. This form of interpretation is known as the "neighbourhood" approach (Kruskal & Wish, 1978). Other approaches include examining the residuals of the stimulus pairs on the configuration, or dimensional interpretation using multiple linear regression.

Several important factors regarding the appropriate use of MDS must be noted. These include the relationships among the data points, the goodness of fit of the MDS solution and its dimensionality.

Relationship. The objects comprising the data must be related through distances in space (known as Euclidean distances) and are usually represented by points. MDS analyzes the relationship of the distances between the points through the pairwise associations of all points. The measure describing the relationship between points is known as the **proximity** measure. Data sets for MDS are most often presented in the form of symmetrical matrices.

Goodness of fit. In order to discover how well the data fit the geometrical configuration produced by MDS, a stress formula is applied to the proximities. Stress in MDS is found by taking the square root of a normalized residual sum of squares. There are two basic stress formulas used in MDS - Stress Formula 1, and Stress Formula 2. Stress Formula 2 gives a similar reading to Stress Formula 1 but uses a different normalizing factor for the denominator which results in a stress reading in larger numbers. Generally, Stress Formula 2 is thought to be more

Table 5: <u>Multi-dimensional scatterplot for counsellor 3, session</u>
<u>1</u>

Derived Stimulus Configuration
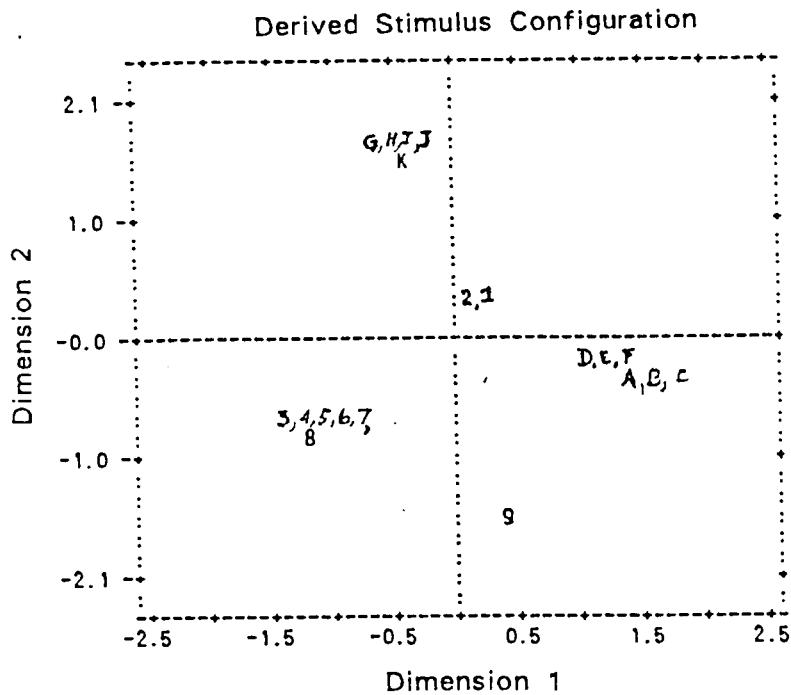
Legend

Concept Name	Plot Symbol	Dimension 1	Dimension 2
guiding	1	0.089	0.260
modelling	2	0.089	0.260
awareness	3	-1.198	-0.829
contact	4	-1.198	-0.829
genuine	5	-1.198	-0.829
positive feedback	6	-1.198	-0.829
warmth	7	-1.198	-0.829
support	8	-1.198	-0.829
structure	9	0.386	-1.634
exploring	A	1.399	-0.266
focusing	B	1.399	-0.260
specific and real	C	1.400	-0.253
planning	D	1.400	-0.246
steps	E	1.400	-0.242
tasks	F	1.400	-0.241
hang in there	G	-0.355	1.519
expectancy	H	-0.355	1.519
follow-through	I	-0.355	1.519
fading	J	-0.355	1.519
follow-up	K	-0.355	1.519

Table 6: <u>Multi-dimensional scatterplot</u> for <u>counsellor 3, session</u> <u>2</u>

Derived Stimulus Configuration

```
        ┌─────────────────────────────────────┐
   2.1 ─┤                    :                 │
        │                    :                 │
        │                    :                 │
   1.0 ─┤           4      E : D               │
        │              7     :  F              │
        │           5        :    96           │
        │                    : ₁8              │
  -0.0 ─┼────────────────────:────A────────────┤
        │         3          :      C          │
        │                    :      B          │
        │         2          :      G          │
  -1.0 ─┤         H          :      I          │
        │                    :                 │
        │                    :   J             │
        │                  K :                 │
  -2.1 ─┤                    :                 │
        └─────────────────────────────────────┘
       -2.5    -1.5    -0.5   0.5    1.5    2.5
```

Dimension 2 (vertical axis)
Dimension 1 (horizontal axis)
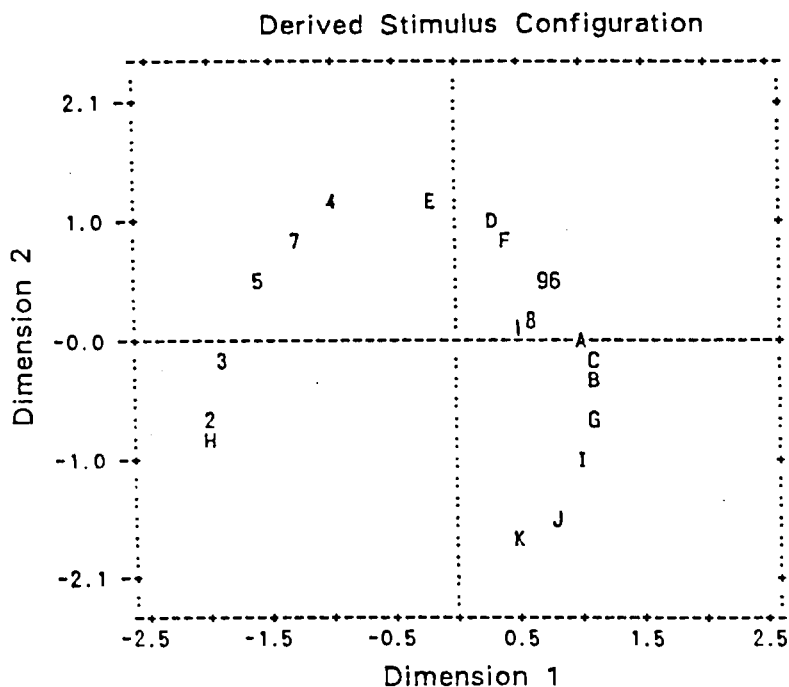
Legend

Concept Name	Plot Symbol	Dimension 1	Dimension 2
guiding	1	0.642	0.252
modelling	2	-2.030	-0.615
awareness	3	-1.919	-0.148
contact	4	-0.956	1.167
positive feedback	5	-1.625	0.450
genuine	6	0.770	0.596
warmth	7	-1.266	0.842
support	8	0.626	0.257
structure	9	0.731	0.531
exploring	A	0.963	0.031
focusing	B	1.057	-0.370
specific and real	C	1.123	-0.130
planning	D	0.306	0.982
steps	E	-0.194	1.150
tasks	F	0.413	0.890
hang in there	G	1.119	-0.609
expectancy	H	-1.989	-0.906
follow-through	I	0.975	-1.052
fading	J	0.751	-1.513
follow-up	K	0.505	-1.807

Table 7: <u>Multi-dimensional scatterplot for counsellor 4, session
1</u>

Derived Stimulus Configuration
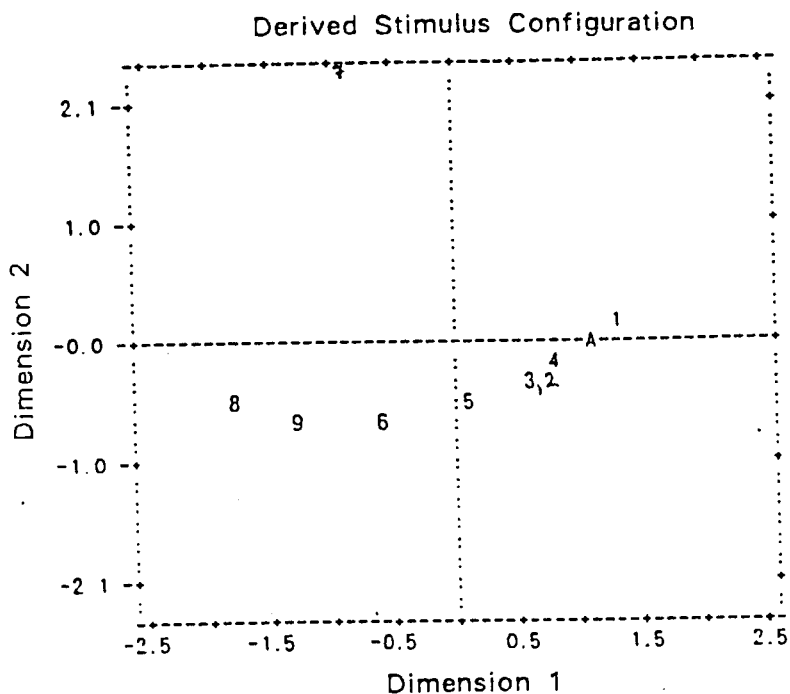
Legend

Stimulus Coordinates

Concept Name	Plot Symbol	Dimension 1	Dimension 2
learning	1	1.326	0.173
skill	2	0.643	-0.269
faith	3	0.643	-0.269
practice	4	0.823	-0.188
motivation	5	0.128	-0.494
persuasion	6	-0.584	-0.638
caring	7	-0.914	2.808
support	8	-1.837	-0.501
modelling	9	-1.279	-0.631
encouragement	A	1.063	0.001

Table 8: <u>Multi-dimensional</u> <u>scatterplot</u> <u>for</u> <u>counsellor</u> <u>4,</u> <u>session</u>
<u>2</u>

Derived Stimulus Configuration
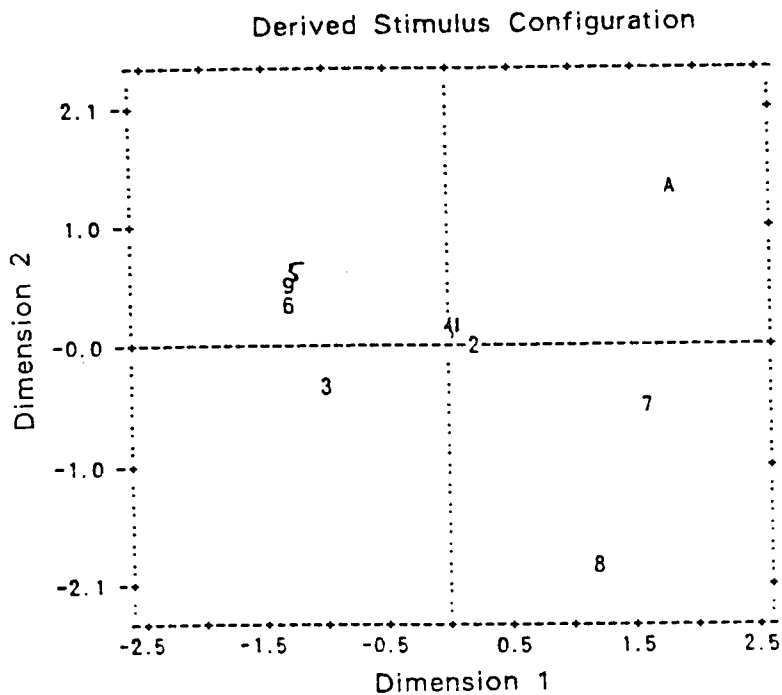
Legend

Stimulus Coordinates

Concept Name	Plot Symbol	Dimension 1	Dimension 2
learning	1	0.043	0.101
skill	2	0.185	-0.002
faith	3	-1.030	-0.292
practice	4	0.041	0.098
motivation	5	-1.332	0.290
persuasion	6	-1.316	0.332
caring	7	1.631	-0.522
support	8	1.237	-1.879
modelling	9	-1.286	0.509
encouragement	A	1.826	1.364

suitable for discovering goodness of fit in preference data (Kruskal & Wish, 1978). In this paper Stress Formula 1 is used, because the data are derived from a measure of **association** between objects. The values which formulate the stress calculation are the **discrepancies** between the proximities and the scaled stimulus co-ordinates. The smaller the discrepancies, the better the fit. For Stress Formula 1, a stress reading of 0 would mean that there are no discrepancies. It is best then, to achieve a stress value as close to 0 as possible. However, a caution should be mentioned here. Because MDS is primarily exploratory and the data are most often subject to the influence of many variables, a stress of too close to 0 (i.e., .01 or .02) is very rare and should be regarded with some suspicion. On the other hand, a stress value of above .15 generally indicates a poor fit to the data. To reduce the stress factor to the smallest possible measure, several conditions in the data should be met (Kruskal & Wish, 1978):

1. the data should be a result of nonmetric scaling (i.e., monotonic regression);

2. the proximity values should be calculated from Euclidean distances;

3. although a few missing proximities do not have much effect, there should be no proximities missing;

4. a few ties will not have too much effect, but, in general, there should be no ties in the data.

Dimensionality. MDS can be computed in "n" number of dimensional spaces. One way of reducing a stress factor that is

Table 9: <u>Multi-dimensional</u> <u>scatterplot</u> <u>for</u> <u>counsellor</u> <u>5,</u> <u>session</u>
<u>1</u>

Derived Stimulus Configuration

```
        -+----+----+----+----+----+----+----+----+----+----+-
        :                         :                         +
  2.1 -+                          :                         +
        :                         :                         :
        :                         :                         :
        :                         :                         :
  1.0 -+                          :        1,2,3            +
        :                         :          4              :
        :                         :          5              :
        :        6,7,8,9,A        :                         :
        :          B              :                         :
 -0.0 -+-------------------------:-------------------------+
        :                         :                         :
        :                         :                         :
        :                         :                         :
        :                         :                         :
 -1.0 -+                          :                         +
        :                         :  C E                    :
        :                         :  F D                    :
        :                         :                         :
        :                         :                         :
 -2.1 -+                          :                         +
        :                         :                         :
        -+----+----+----+----+----+----+----+----+----+----+-
        -2.5    -1.5    -0.5     0.5     1.5     2.5
```
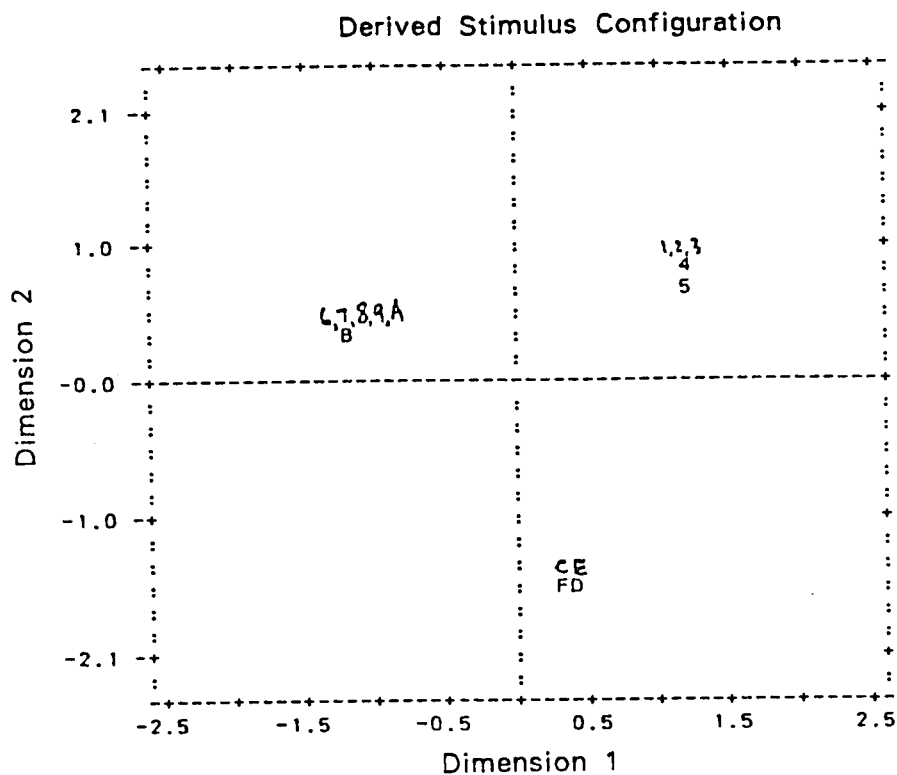
Dimension 1

Legend

Concept Name	Plot Symbol	Dimension 1	Dimension 2
rapport	1	1.446	-0.222
trust	2	1.446	-0.222
warmth	3	1.446	-0.222
encouragement	4	1.446	-0.222
support	5	1.446	-0.222
goals	6	-0.896	-1.084
increments	7	-0.709	1.036
accessibility	8	-0.875	-1.126
expectancy	9	-0.680	1.173
desire to change	A	-0.420	1.407
clear focus	B	-1.041	-0.540
modelling	C	-0.353	1.436
covert practice	D	-0.589	1.226
consequences	E	-0.832	-1.210
reward	F	-0.832	-1.208
regular contact	G	0000	0000
follow-up	H	0000	0000

Table 10: <u>Multi-dimensional scatterplot for counsellor 5,</u>
<u>session 2</u>

Derived Stimulus Configuration
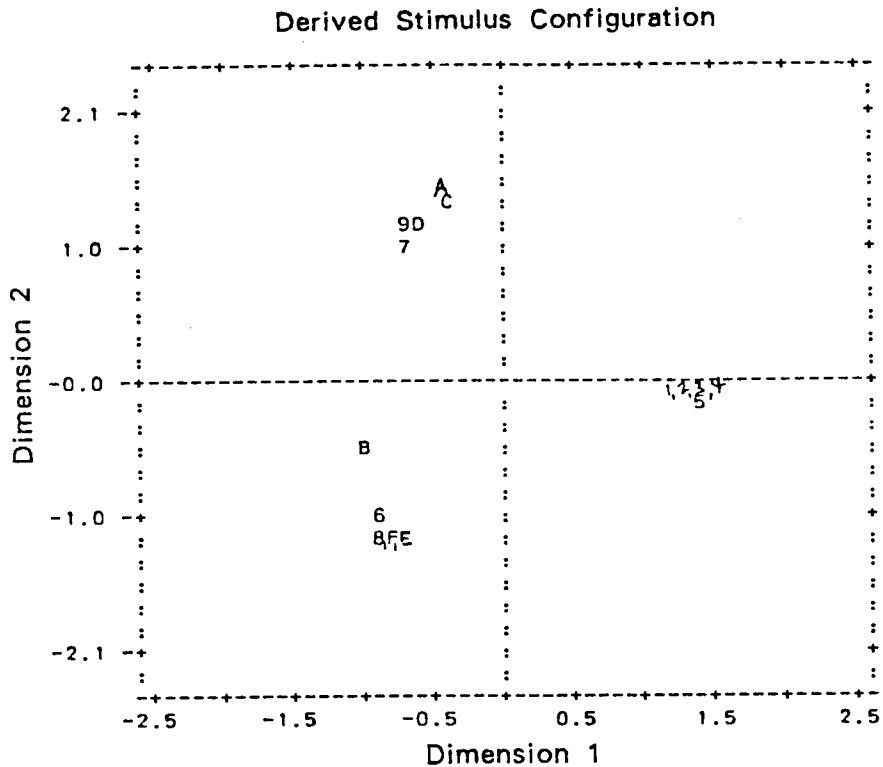
Concept Name	Plot Symbol	Dimension 1	Dimension 2
rapport	1	1.188	0.816
trust	2	1.192	0.813
warmth	3	1.194	0.782
encouragement	4	1.194	0.783
support	5	1.205	0.761
goals	6	-1.233	0.359
increments	7	-1.233	0.359
accessibility	8	-1.233	0.359
expectancy	9	-1.233	0.359
desire to change	A	-1.233	0.359
clear focus	B	-1.233	0.359
modelling	C	0.365	-1.524
covert practice	D	0.365	-1.524
consequences	E	0.349	-1.529
reward	F	0.349	-1.529
regualr contact	G	0000	0000
follow-up	H	0000	0000

Table 11: <u>Multi-dimensional scatterplot for counsellor 6,</u>
<u>session 1</u>
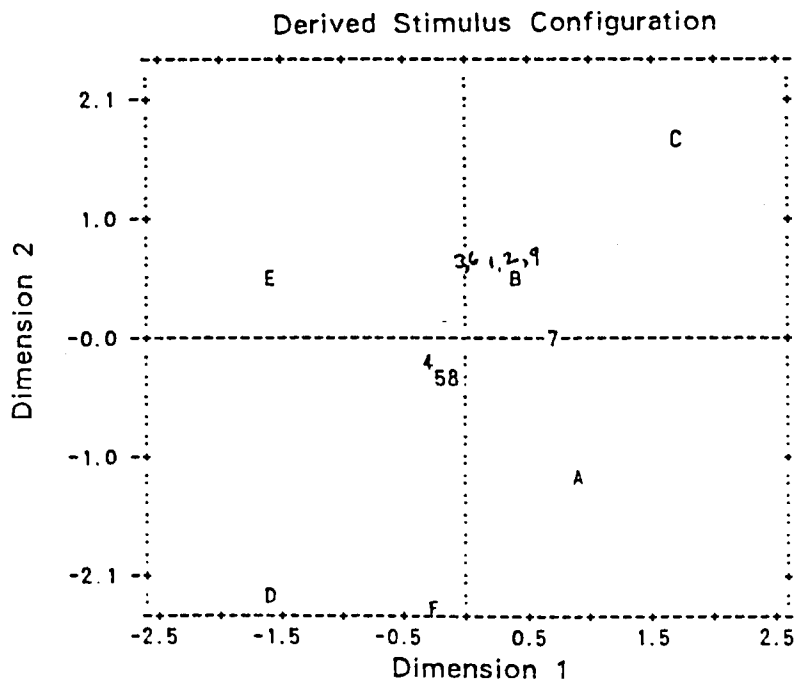
Derived Stimulus Configuration

Legend

Stimulus Coordinates

Concept Name	Plot Symbol	Dimension 1	Dimension 2
awareness	1	0.400	0.566
learning	2	0.401	0.564
persuasion	3	0.660	0.033
non-judgement	4	-0.104	-0.272
relaxation	5	-0.200	-0.268
rapport	6	0.666	0.029
support	7	0.745	0.040
comfort	8	-0.110	-0.266
feedback	9	0.402	0.566
expression	A	0.922	-1.276
change in perspective	B	0.414	0.544
structure	C	1.718	1.739
intimacy	D	-1.561	-2.248
expectation	E	-1.631	0.548
optimism	F	-2.718	-0.297

Table 12: <u>Multi-dimensional</u> <u>scatterplot</u> <u>for</u> <u>counsellor</u> <u>6,</u>
<u>session</u> <u>2</u>
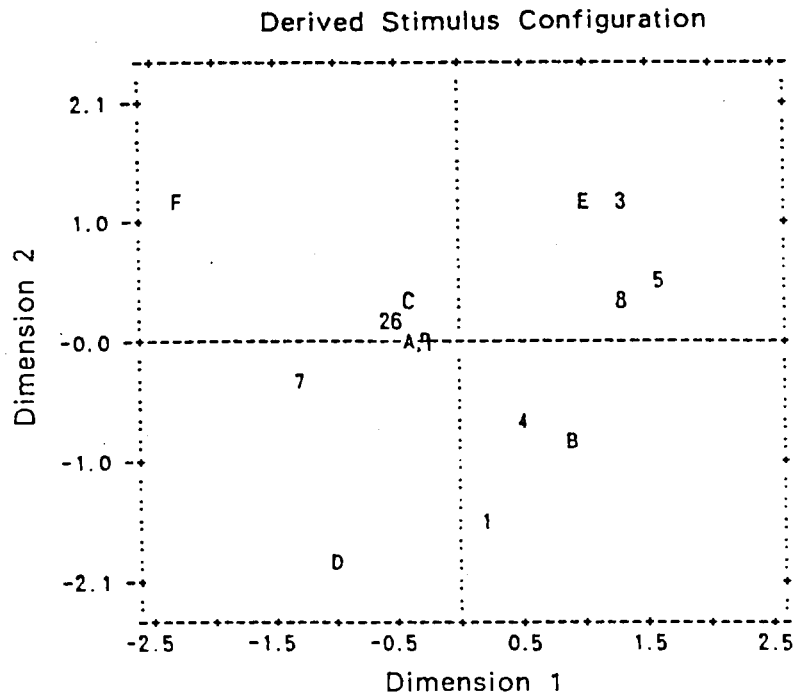
Derived Stimulus Configuration

Legend

Stimulus Coordinates

Concept Name	Plot Symbol	Dimension 1	Dimension 2
awareness	1	0.194	-1.638
learning	2	-0.619	0.196
persuasion	3	1.305	1.254
non-judgement	4	0.543	-0.708
relaxation	5	1.643	0.433
rapport	6	-0.462	0.255
support	7	-1.326	-0.354
comfort	8	1.331	0.381
feedback	9	-0.389	0.072
expression	A	-0.397	0.083
change in perspective	B	0.862	-0.858
structure	C	-0.394	0.385
intimacy	D	-0.972	-1.934
expectation	E	0.952	1.262
optimism	F	-2.273	1.169

still too large even after the conditions mentioned above are met, or if for some reason those conditions can not be entirely met, is to compute a solution in more dimensions. The more dimensions used, however, the more difficult it is to represent the results graphically, and this makes the interpretation of the results more difficult. The number of dimensions used however, is somewhat restricted to the number of points given in the matrix. (Data with fewer points are, obviously, subject to greater error.)

Most MDS computer programs have a routine which automatically "tests" the goodness of fit for as many dimensions as the data will bear, until the stress does not improve past .01, or .001. (The ALSCAL MDS program used for this paper tests the fit to .001.) The general rule of thumb is that there should be at "least twice as many stimulus pairs as parametres [also called dimensions] to be estimated, to assure an adequate degree of statistical stability" (Kruskal & Wish, 1978, p. 34). With the exploratory nature of the present paper in mind, two dimensions were considered sufficient because of the small numbers of stimulus pairs on some of the counsellors' maps, and for ease of interpretation, and comparibility among counsellors. See Tables 2 to 15 for the MDS configurations.

Stress Values

Overall, the stress values are somewhat high. See Table 1 for the MDS stress values. This could mean that additional structure could be latent in the data besides the associative pattern identified for a two-dimensional solution. It could also be an indication of unreliability in the data. When stress values are high, it is generally best to see if the data fit better when represented in more dimensions. In this case, however, the number of data points from most counsellors is too small for this to be done.

There are four configurations that have stress values within the acceptable range. These are counsellor #1 - session 2 (.107), counsellor #3 - session 2 (.094), counsellor #4 - session 1 (.075), and counsellor #7 - session 1 (.064). These form a distinctive "C", "cup" or "U" shape (except for counsellor # 7). Davison (1983) states that configurations in two dimensions with these shapes may demonstrate a one-dimensional stimulus structure. The data should then be analyzed in a higher dimension, if possible, to give a better fit. However, these shapes also follow the pictures on their corresponding maps quite closely, so the data may be legitimately represented by the solutions.

Ten scatterplot configurations demonstrate stress levels above 0.15. Although a few ties in proximity values do not make a large difference in the robustness of MDS data, there are actually a large number of ties for some of the stimulus points.

Table 13: <u>Multi-dimensional</u> <u>scatterplot</u> <u>for</u> <u>counsellor</u> 7, <u>session</u> 1
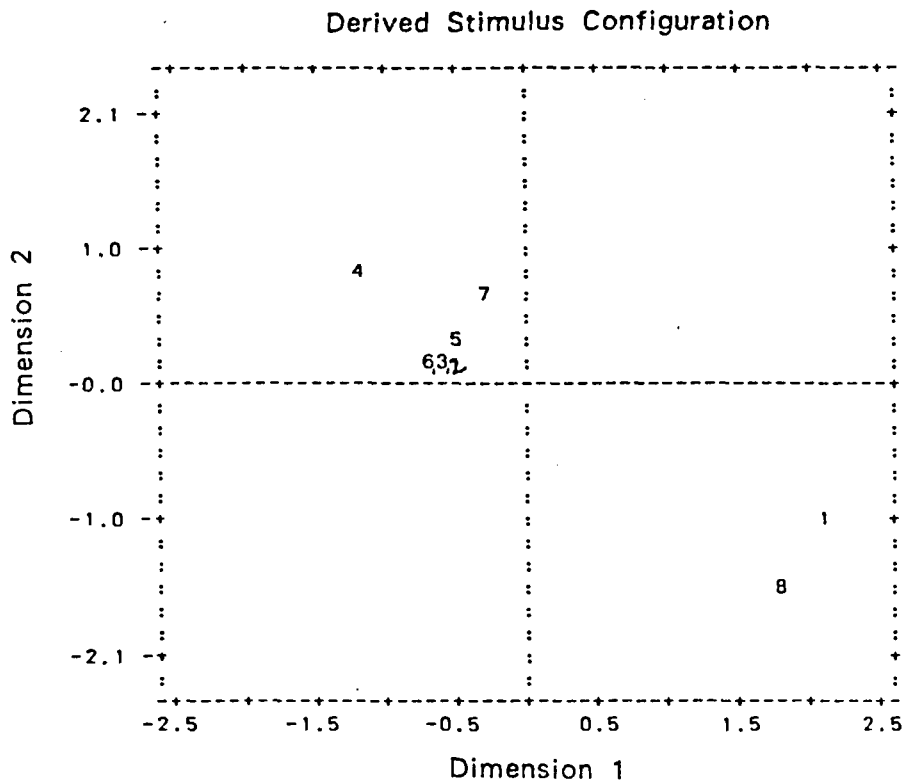
Derived Stimulus Configuration

Dimension 1

Legend

Stimulus Coordinates

Concept Name	Plot Symbol	Dimension 1	Dimension 2
context of problem	1	2.112	-1.124
focusing	2	-0.654	0.228
relationship	3	-0.647	0.250
willingness/influenc	4	-1.171	0.818
feedback/objective	5	-0.540	0.403
emotional assistance	6	-0.656	0.223
exploration	7	-0.278	0.738
sense of growth	8	1.834	-1.536

Table 14: <u>Multi-dimensional scatterplot for counsellor 7,</u>
<u>session 2</u>
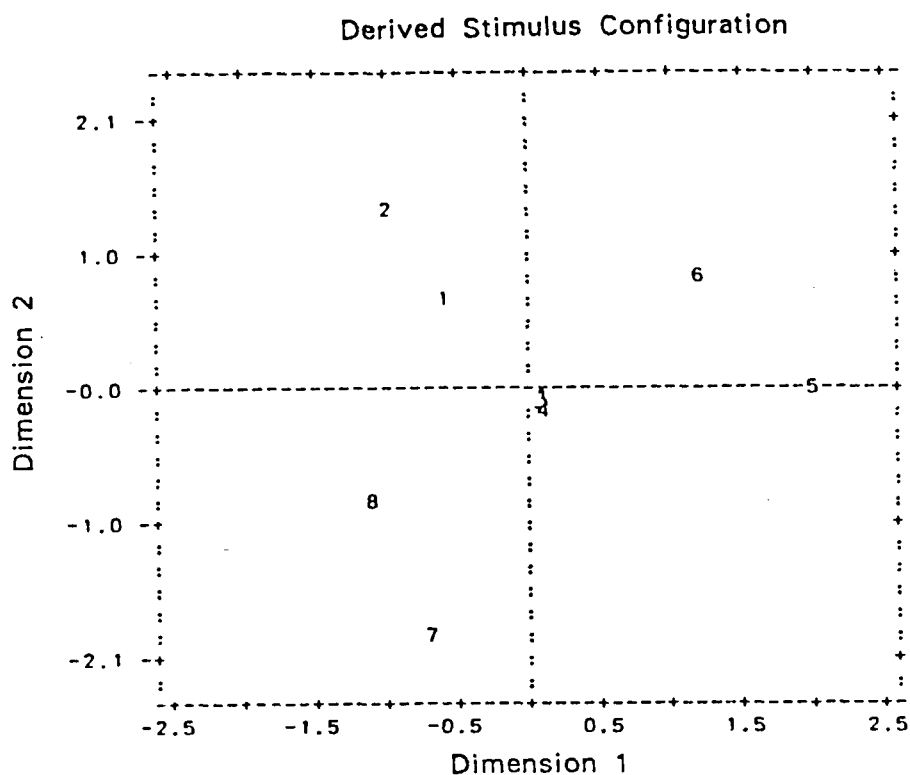
Derived Stimulus Configuration

Dimension 1

Legend

Stimulus Coordinates

Concept Name	Plot Symbol	Dimension 1	Dimension 2
context of problem	1	-0.553	0.770
focusing	2	-1.039	1.454
relationship	3	0.105	-0.167
willingness/influenc	4	0.104	-0.170
feedback/objective	5	1.969	0.060
emotional assistance	6	1.200	0.785
exploration	7	-0.664	-1.848
sense of growth	8	-1.121	-0.885

Table 15: <u>Multi-dimensional</u> <u>scaling</u> <u>stress</u> <u>values</u> <u>per</u> <u>matrix</u>

Counsellor	Session	Stress
1	1	0.189
	2	0.107
2	1	0.163
	2	0.257
3	1	0.192
	2	0.094
4	1	0.075
	2	0.241
5	1	0.271
	2	0.203
6	1	0.236
	2	0.286
7	1	0.064
	2	0.191

On closer inspection of the stimulus co-ordinates on Figures 19, 23 and 24, a large number of ties can be found. When many proximities have the same value this can increase the stress levels. Generally, the MDS data do not appear reliable for the cognitive maps. From these results it is difficult to judge whether the MDS data give evidence that the measure of association is meaningful.

Qualitative Observations

Qualitatively the MDS configurations correspond well to the cognitive maps in terms of shape and networking of the counsellors' words. That is, the concepts on the maps with many links and lengthy networking appear on MDS configurations as

close to one another on the configurations. Perhaps if the measure of association data were less variable, the MDS interpretations may have been more reliable, or the scaling could be calculated in higher dimensions. This will be discussed in more detail in the Discussion section of this paper, under Methodology.

Aside from the poor statistical solution obtained from the multi-dimensional scaling results, a number of qualitative observations are noteworthy from visually inspecting the configurations. Davison (1983) and Kruskal and Wish (1978) believe that qualitative interpretation of MDS data is valid and useful. Such interpretations should not be ignored as they may provide useful links to further research.

The points on the configurations derived from the first counselling session data appear compartmentalized into small groups of points. The small groups seem individually related in composition of points to the clusters of concepts on the maps. The points on the configurations from the second counselling session data appear, generally, more scattered and less grouping is noticeable. When comparing second configurations to first configurations, the points seem to have "exploded" from their original positions. See Figure 15 for a graphic depiction of this effect. By calculating the means of the absolute values of the loadings on the two dimensions, it can be seen that in dimension 1 the means are all larger for session 2, except for counsellor 7. The opposite appears to have occurred in dimension 2, where the means are all smaller for session 2, except for

counsellors 6 and 7. This difference might be explained by different structure being picked up by the two-dimensional solution, with dimension one representing expanding schema and dimension two representing the improved closeness of the concepts as they interact more throughout the network. Again, this picture suggests more interaction among points, and more "movement" of the concepts. Such evidence reinforces the same finding in the session 2 cognitive maps. This picture fits with the notion that peoples' concepts expand with more knowledge, or more experience.

Figure 15: A comparison between the means of dimension 1 and dimension 2 for sessions 1 and 2 for each counsellor
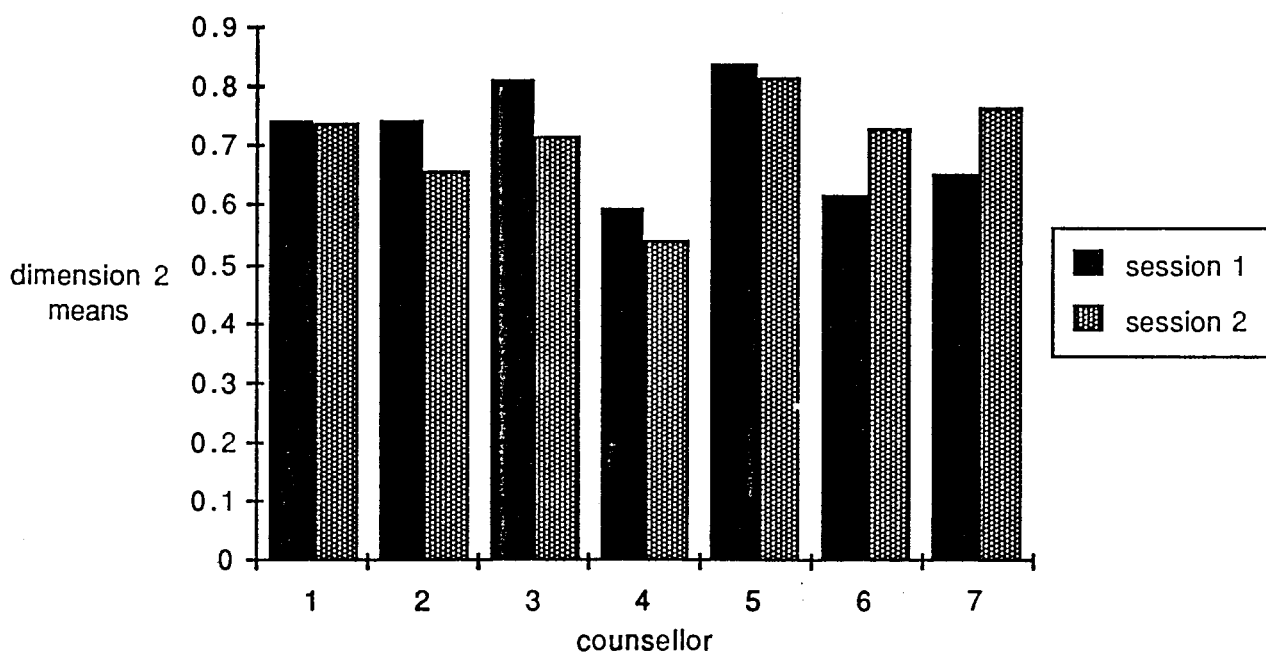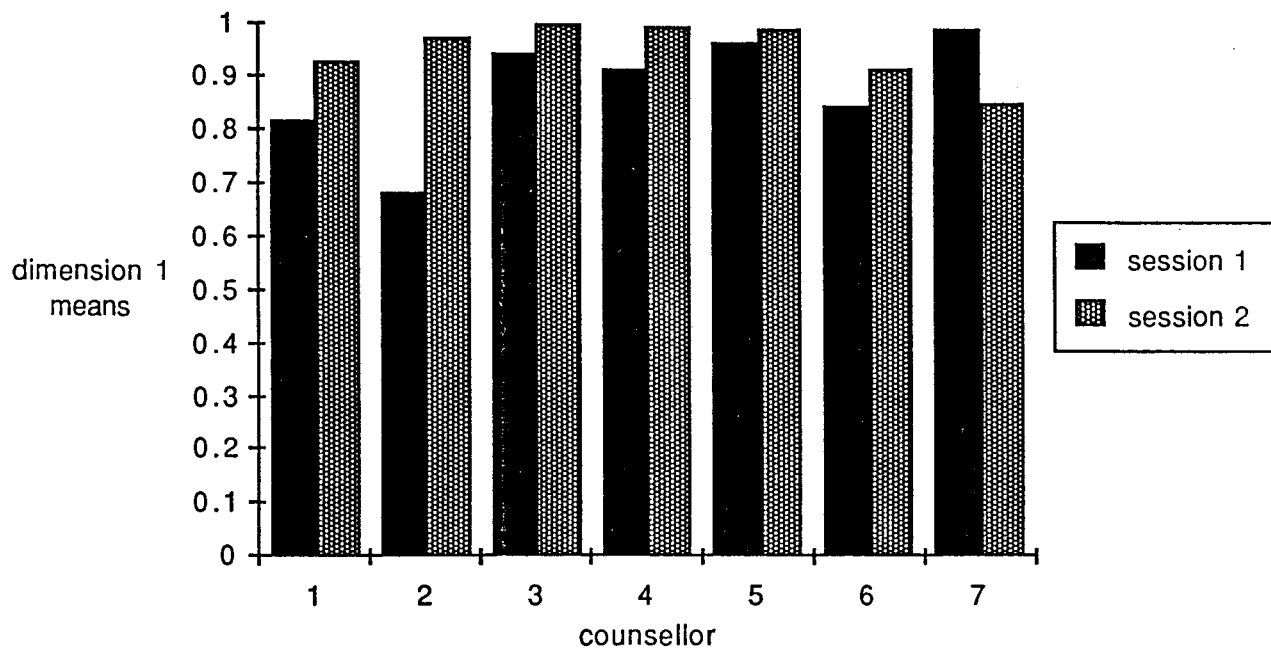
CHAPTER V

DISCUSSION AND IMPLICATIONS

The discussion section of this paper is divided into two
parts; a description section exploring the parameters of the
study measures, and a section discussing the methodology used in
the study. Throughout, I examine the limitations of the study
and make recommendations for further research. Caution needs to
be observed in discussing the results as the study is
essentially descriptive and exploratory and the sample size
small. Generalizations to other groups of novice counsellors
cannot be made at this time. These findings help to suggest
hypotheses and methodological insights for new studies to be
conducted in a cognitive-mediational paradigm.

Study Variables

Cognitive Maps

The use of the Cognitive Map Task as a measure of novice
counsellor cognitive schema is untried, although development of
the measure is based on previous work by Martin (1984b, 1985)
and Martin, Martin, Meyer, and Slemon (1986). In his work,
Martin (1985a, p.22) cautions researchers to remember that
"cognitive structure is a hypothetical construct that attempts
to capture something of the organization of concepts in memory.
Its hypothetical status should not be overlooked". Heeding
Martin's circumspectness, it is evident that the information
captured by the Cognitive Map Task is also extremely subjective.

However, both of these concerns must be accepted as a priori when used with a cognitive-mediational research design.

Readers must remember that the purpose of **cognitive-mediational** research is not only to access more information on the counselling process itself, but to access it from an alternative perspective - one as close to intrapersonal cognitive process as possible. Needless to say, there is no possible way to gain entry to peoples' thoughts as they occur. Therefore, researchers must devise methods that capture **traces** (Winne & Marx, 1980) of cognition, or that are analagous to cognition. The strength of the Cognitive Map Task as an instrument lies in the rich and complex information it accesses. The **interpretation** of this information into knowledge must come from close study and creative speculation of these data. The Cognitive Map Task shows promise as a research tool by providing an intriguing glimpse of novice counsellor cognitive schema.

It is difficult to determine from the results of this study whether the cognitive schemas demonstrated on the maps relate to the "higher-order" cognitve activities which Blocher (1983), and Hill, Charles and Reed (1981) write of, or the procedural knowledge structures Martin (1985) suggests.

Clues to the type of cognitive activity occurring may be found from speculating on the change displayed on the cogntive maps between counselling session 1 and counselling session 2. Presumably, in the ten weeks between the two sessions, both practice and some degree of experience in counselling have been gained. Moreover, these counsellors have been supervised in the

framework of Martin and Hiebert's (1985) counselling skills. The more interactive second session maps may be reflective of the counsellors' learning a new system of counselling skills, thus replacing their old systems, or adding new chains of concepts to their old systems. Or, in conjunction with practicing new skills and gaining experience in the use of these skills during the practicum, the change may reflect the emergence of new understandings of counselling in general.

Many participants in this study expressed dissatisfaction or frustration with having to use the same word list while completing the second cognitive maps. They wished they could make up new words as they reported that they felt their concepts of "counselling in general" had changed. As mentioned earlier, it has been suggested that the conceptual level of counsellors directly affects counsellor behaviour in counselling sessions (Fuqua, Johnson, Anderson, Neuman, 1984; Goldberg, 1974; Hirsch & Stone, 1983) and counsellors' ability to process large amounts of information (Blocher, 1983; Wexler, 1974). The activity and integration seen on the second cognitive maps, may be an indication of growth of conceptual level in these novice counsellors. Perhaps the existing word lists were inadequate or too limiting for the counsellors to express their new conceptual understanding of counselling. It appears then, that some novice counsellors begin counselling with a limited and static set of concepts which make up their counselling frameworks. With more experience in counselling these novice counsellors have made more connections inside this framework, perhaps more fully

understanding the concepts of these frameworks. However, other counsellors appear to begin with unconnected or disorganized concepts and then change to organized, compartmentalized groups of concepts. Perhaps these novice counsellors needed to "pull together" their thoughts and create a workable framework. From this study it is seen that novice counsellors concepts were more connected after having obtained counselling experience in a supervised environment. It may be that both the experiential and supervirsory components are needed to help new counsellors expand and/or organize their counselling schemas.

Measure of Association

The measure of association used to score the relationships between the words on the cognitive maps proved worthwhile. By providing numerical values to the word associations, thus standardizing these associative relationships, the measure of association accesses another level of data from the maps that simply visually scanning the diagrams does not provide. For example, it is easier to notice ties between words on individual maps. In looking at Figure 9, many of the words have equal associations in that each word is connected to every other word in each group. It is not so easy to see this between the words "A-awareness", "B-learning" and "I-feedback" on Figure 11. It is also easier to gain an understanding of interlinking between the words. Perhaps an even greater sense of interlinking could be achieved if the decision rule limiting the count of routes to ten links is bypassed. Originally it was thought that the

greater the number of links, the weaker the relationship between those two words. However, it seems more plausible that accounting for greater interlinking would provide access to more complex associations.

Other types of information could be sought from these associative values. It could be interesting, for instance, to speculate on which words might be central concepts in individual counsellor schemas, and how these concepts change across pre and post session maps. This could be done by inspecting the concepts with the largest associative values indicating an influence throughout the concept network. Or, perhaps the addition of new words to the second task could be allowed. Then, conjecture on how the network associations have grown to include the new words could be made. Such information could provide useful clues to concepts that novice counsellors consider central to the counselling process.

Multi-dimensional Scaling

The multi-dimensional scaling technique was a fascinating technique to work with. This method was chosen to quantify the measure of association data. There are actually many techniques available to researchers which fit under the classificaiton of **multi-dimensional scaling**, but in general MDS is a method for assessing the fit of a set of scaled parameters originating from proximity data. Some researchers lump factor analysis and cluster analysis methods with multi-dimensional scaling, but those authors who have researched and written solely on

multi-dimensional scaling prefer to distinguish between the
three methods (Davison, 1983; Kruskal & Wish, 1978).

First, MDS is more closely related to factor analysis than
cluster analysis, as cluster analysis solutions are demonstrated
in qualitative stimulus groupings. MDS and factor analysis both
use quantitative dimensional representations of stimulus
structure. MDS differs from factor analysis in two major ways:

1. the experimental procedures used to gather the data (i.e.,
    in factor analysis data often stem from rating scales and
    are usually recorded as correlations).

2. MDS provides simpler and more easily interpretable solutions
    (i.e., MDS representations provide quantitative descriptions
    of objects, whereas factor analysis solutions provide
    quantitative descriptions of factor scores; these scores may
    be compared for individual differences and MDS cannot be
    used this way).

In terms of the speculative nature of this study, MDS seemed a
more appropriate method to use for quantitative analysis, as it
promised more flexibility. Moreover, it is more suited to the
measure of association data generally, as well as the search for
a format in which to view any possible structure in the data.

MDS may be simpler when compared to factor analysis, but MDS
is actually a complex technique and one that requires some
experience to use. As a first-time user and student of MDS, I
had some problems "combing out" meaningful interpretations of
the stimulus configurations. Part of this difficulty stems, I
believe, from the large amount of variance in this set of data.

This can be seen in the high stress levels (c.f. Table 1). For instance, as stated earlier, a few ties in the proximity values do not make a large difference in the robustness of the data, but there were actually a large number of ties in stimulus points. (c.f. Figures 19, 23 and 24) Another example can be seen in the counsellors' interpretations of the Cognitive Map drawing rules. As well as connecting words to one another, counsellors drew individual words connecting to whole groups of words, or interconnected each and every word on their maps (c.f. Figures 5, 9 and 10). Perhaps if more control was placed on the variations of arrangements counsellors made with their words on the maps, this problem could be reduced. Also, the number of words counsellors included on their word lists differed greatly. This variance produced a very small set of data points for some of the counsellors, which eliminated the possibility of lowering the stress levels by solving the representations in more dimensions.

These inconsistencies represent the technical problems to be expected in a trial run of a new method of analysis more than as an indication that the method itself is inappropriate for use with this type of information. I should caution researchers, however, that interpretation of multi-dimensional scaling results is an outstanding problem with this technique (Driscoll, 1985). Sound knowledge of the particular MDS technique being applied and an understanding of matrix algebra are two essential pre-requisites to the successful use of the multi-dimensional methods.

Methodology

The central aim of this study is to explore and add to the development of new methods for research in counselling psychology. There has been a call for methodological pluralism (Howard, 1984; Neimeyer & Resnikoff, 1982; Polkinghorne, 1984). Specifically, several researchers have been investigating the use of cognitive-mediational paradigms (Hill, Charles & Reed, 1981; Hirsch & Stone, 1983; Martin, 1894a, 1985a; Martin, Martin, Meyer & Slemon, 1986). This methodology and its application to the assessment of cognitive schema are in the early stages of development. However, the importance of exploring the processes and structures which are interacting during counselling exchanges between counsellors and clients cannot be understated. The ability to describe the development of these events is a key to teaching cognitive competence to both counsellors and clients (Blocher, 1983; Martin, 1984b).

This study accomplishes its purpose in adding to the development of new counselling psychology research methodology, particularly with regard to cognitve-mediational designs. A unique feature of this research is that the data stem from novice counsellors in real counselling settings. Much previous work has come from counselling analogues (Hirsch & Stone, 1982), exploration of counselling sessions post facto (Martin, Martin, Meyer & Slemon, 1986), or viewing video-taped counselling sessions (Hirsch & Stone, 1983). This study has tapped the cognitive processes of novice counsellors **as they are about to**

enter real counselling sessions, during their practicums. Such a step is a first attempt to assess the cognitive processes occurring **before** a counselling session from the point of view of the **counsellor.** Even though the cognitive maps are in some senses analogue thought processes, from evidence given in previous research on teacher cognitions through process tracing (Peterson, Marx & Clark, 1978), this method seems to get closer to actual counsellor cognitive schema than previous methods where counsellors talk about their couselling, or code it after the session has taken place. It was difficult, throughout, to maintain a cognitive-mediational frame of reference, and the temptation to insist on searching for more "concrete findings" was enormous. However, to research with alternative methods one has to make a full committment to the method. Perhaps we, as researchers have to make adjustments in our cognitive schema in order to accept the new point of view such research offers.

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