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ABSTRACT
                The utility of schematic maps as tools for the early
stages of both peer counseling and self-counseling was explored in
two studies. In experiment 1 (self-counseling), 42 students (18 males
and 24 females) from undergraduate general psychology classes
participated to fill course requirements. Participants were assigned
to a schematic map or essay group. They first extracted information
about their alcohol-related behavior patterns and then analyzed the
patterns from the perspective of a counselor. In experiment 2 (peer
counseling), 38 students (14 males and 24 females) from upper
division psychology courses participated for extra credit.
Participants were asked to evaluate behavior patterns, in the form of
maps or essays, which were presented either in the same form as they
were extracted, or were transposed to the other format. In both
studies, assessment consisted of questionnaires that addressed the
usefulness of the tools in the counseling process. Schematic maps are
potentially powerful tools for both self-counseling and peer
counseling. For self-counseling, maps were preferred over traditional
essay writing. In addition, the subjective reaction to maps as tools
for peer counseling was positive. Four figures illustrate the
discussion. (Author/SLD)

Schematic Maps: Cognitive Tools for Enhancing

The Early Stages of Counseling

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Running Head: SCHEMATiC MAPS

Abstract

The purpose of the present studies was to explore the utility of schematic maps as tools for the early stages of both peer and self-counseling. In experiment 1 (self-counseling), 42 students from undergraduate general psychology classes participated to fulfill course requirements. Participants were assigned to either a schematic map or essay group. They first extracted information about their alcohol-related behavior patterns and then analyzed the patterns from the perspective of a counselor. In experiment 2 (peer counseling), 38 students from upper-division psychology courses participated for extra credit. Participants were asked to evaluate behavior patterns, in the form of maps or essays, which were presented either in the same form as they were extracted or were transposed to the other format. In both studies, assessment consisted of questionnaires, which addressed the usefulness of the tools in the counseling process. Schematic maps are potentially powerful tools for both self- and peer counseling. For self-counseling, maps were preferred over traditional essay writing. In addition, the subjective reaction to maps as tools for peer counseling was positive.

Schematic Maps: Cognitive Tools for Enhancing

The Early Stages of Counseling

The purpose of the present studies was to explore the utility of schematic maps as tools for the early stages of both peer and self-counseling. The content focus of this enterprise was on destructive patterns of behavior related to alcohol use.

This research is based on the assumption that there are two prerequisites for effective counseling at all levels (i.e., expert, peer, and self). The first is an understanding of behavior patterns, including their components and the mechanisms that maintain and support them. The second is a veridical and an efficient means of extracting these patterns and communicating them to peers, experts, and oneself.

Understanding Behavior Patterns

Most often an action, like drinking too much, is not an isolated event. There are precipitating events, thoughts, and expectancies that lead to or trigger the behavior. These precipitating events, thoughts and feelings, the supporting expectancies and prior experiences, the action plans, actual behavior, and consequences are what we collectively refer to as a behavior pattern. Behavior patterns are action and thought sequences that are repeated to produce both short- and long-term consequences. Behavior patterns are best viewed as homeostatic systems of behavior, maintained and perpetuated by feedback systems.

There have been many attempts at illustrating systems of behavior. Control (systems) theory (Carver, 1979; Carver & Scheier, 1982) describes the role of negative feedback loops in reducing and negating discrepancies between the present state and a specified standard in the flow of human behavior. The

system becomes rather complicated when one considers the hierarchical organization of larger and smaller control (negative feedback) units. This organization creates a system in which a behavior can appear to correct one particular discrepancy while creating a new disturbance farther down the line. In addition, according to control theory, one problem behavior may be merely a symptom of a greater disturbance farther up in the system hierarchy. An example of this type of "referred" symptom is alcohol use. One may use alcohol at a party to overcome shyness or social inhibition. While the alcohol use may appear to be the major problem eventually, it is symptomatic of a more pervasive disturbance.

It is important for counselors of all types (especially peer and self-counselors) to understand the structure and dynamics of behavior patterns. Too often we are guilty of treating a symptom rather than treating the actual problem, as illustrated in the alcohol use example above. It is essential that counselors be aware of precipitating factors that lead to the destructive behavior. In addition to these factors there is other important information to be gleaned from behavior patterns. This includes exit routes from the behavior pattern, options for modifying the pattern, warning signs that a maladaptive problem is developing, and means of evaluating/monitoring the events, thoughts, and feelings within the pattern.

Tools for Extracting/Communicating Behavior Patterns

In order to gain an understanding of an individual's complex psychological system, it is necessary to be able to represent it in a manageable form. This includes representation of loops and parallelisms that tend to support or disrupt behavior.

One potential hindrance in a counseling situation, whether professional, peer, or self-counseling, is that of extracting the necessary information for a thorough and accurate representation and examination of the problem or behavior pattern. This barrier is illustrated in another well-documented phenomenon called the expert paradox (Newell & Simon, 1972). Many scholarly individuals considered to be experts in their fields have great difficulty in communicating the information they know to other people. A good example of this is the intelligent college professor who is an ineffective instructor because he/she can't transmit information on a level comprehensible to the average college student.

Information about behavior patterns must be retrieved from one's episodic memory source, which has several characteristics that may hamper adequate extraction (Tulving, 1983). These characteristics include a loose, spatial/ temporal organization that may reduce the availability of critical information and impede one's ability to make inferences. In addition, individuals tend to feel an intense, and sometimes false, subjective veridicality about events they have experienced and subsequently retrieved from episodic memory. And finally, episodic memories carry with them affective components that can dramatically influence retrieval (Bower, 1981).

Unfortunately, natural language appears to be extremely limited as a representational device in this realm. Because of the unique nature of episodic memory, the affect with which it is often associated, and the weaknesses of natural language, it is necessary to provide individuals with tools to organize, "neutralize," and represent their recollections of episodes in order to effectively reduce the discomforts associated with a behavior pattern. This has led to the

consideration of other representational modes in the development of tools to assist counselors in their efforts. In this regard, Schematic Knowledge Maps appear to offer substantial potential in capturing the nuances of the complex systems that spawn personal problems while compensating for the lack of organizational characteristics of episodic memory.

Schematic Knowledge Maps

Schematic knowledge maps are one type of map generated by the TCU mapping system. Knowledge maps are information processing tools that represent information in two-dimensional node-link-node displays (Figure 1). The nodes contain the key concepts or ideas and links specify the relationship between the nodes. Links are named and given direction using arrowheads (see Figure 2). For a thorough description of the TCU mapping system see Evans and Dansereau (in press), and Lambiotte, Dansereau, Cross, and Reynolds (1989).

Recently, work with knowledge maps has been directed at using the tools to represent complex systems schematically (Peel & Dansereau, 1990; Skaggs, Rewey, & Paulus, 1990). When students fill in expert-formatted maps (schematic knowledge maps), they receive the benefits of active processing without having to struggle with overall map organization and construction.

The most recent research with schematic knowledge maps used them as tools for representing expert information about alcohol-related behavior patterns and for extracting information about one's own alcohol-related behavior pattern. Results indicate that participants recall more expert information when it is presented in map form than text (Dees, Dansereau, Peel, Knight, Boatler, &

Loftis, in press) and that maps provide a more effective way of representing personal information regarding alcohol use patterns (Dees & Dansereau, 1991).

Maps with a superimposed schematic structure can serve as tools for schematizing episodic memory (see Figure 3). It is assumed that this structure facilitates the understanding, illumination, and examination of destructive patterns of behavior, reinforcement contingencies that perpetuate these behavioral patterns, and specific internal and external forces that influence the actions, feelings, attitudes, and motivations involved in creating a problem. In addition, maps may provide the necessary tools to overcome the peculiarities associated with episodic memory.

General Approach and Specific Objectives

The research reported here was conducted in two experiments. The first experiment was designed to assess the utility of schematic knowledge maps as self-counseling tools while the second was designed to assess maps' potential as peer counseling tools. In both instances, schematic knowledge maps were compared to essay writing, a technique that is analogous to what typically occurs in a counseling session (i.e., an unstructured inquiry about the problem).

In experiment 1 (self-counseling), participants were assigned to one of two treatment groups: schematic maps or essay writing. Participants completed schematic maps or composed essays (extraction phase) about their alcohol-related behavior patterns (or the patterns of people they knew well) and were then asked to switch perspectives to that of a counselor (analysis phase) and make comments about the behavior pattern.

In experiment 2 (peer counseling), participants were asked to evaluate stimulus materials that were generated in a previous experiment The

individuals selected to participate in this study were upper-division psychology students with limited counselor training. The materials consisted of schematic maps and essays concerning alcohol-related behavior patterns. The maps and essays were presented either in the same form as they were extracted or were transposed to the other format. For example, a behavior pattern that was extracted as a schematic map was presented as a map or was transposed to an essay.

The specific questions addressed by the present studies are as follows:

1. Do schematic maps better facilitate the extraction of behavior patterns when compared to essay writing? (self-counseling, Experiment 1)

2. Do schematic maps better facilitate the analysis of one's own behavior pattern than does essay writing? (self-counseling, Experiment 1)

3. Does schematic mapping better facilitate the analysis of a person's behavior pattern than does essay writing? (peer counseling, Experiment 2)

4. Do schematic maps provide better presentation tools for behavior patterns than do essays? (peer counseling, Experiment 2)

EXPERIMENT 1

Method

Subjects

Forty-two students (male=18, female=24) from general psychology classes at Texas Christian University participated to fulfill the requirements for the course.

Materials

Training and treatment materials. Training materials consisted of "Instructions for Describing an Alcohol Behavior Pattern", a sample behavior pattern analysis, and "Instructions for Analyzing the Behavior Pattern."

The "Instructions for Describing an Alcohol Behavior Pattern" asked participants to examine an alcohol-related behavior pattern of their own or of someone they knew. Participants were given either a schematic map or blank sheets depending on their group assignment. To facilitate their understanding of the assignment, participants were given a sample map or essay illustrating a behavior pattern related to hunger and overeating.

The "Instructions for Analyzing the Behavior Pattern" asked participants to read through their patterns as if they were counselors who had been asked to help the individuals who had produced these thoughts. They were then instructed to write comments they thought a counselor might make about the information they had produced.

Evaluation materials. The primary questionnaires used in this study consisted of six questions on an eight-point Likert scale:

1. How much new information did you learn about alcohol-related behaviors?

2. Did this activity help you identify any gaps in your knowledge about alcohol or alcohol-related behaviors?

3. Did this activity help you gain any new ideas or information about general human behaviors?

4. Do you feel better equipped to talk with a friend who may be having problems with alcohol?

5. Did this activity help you realize any contradictions in what you know about alcohol and your own drinking patterns?

6. How much will this activity impact your future alcohol-related behaviors? A series of these questionnaires was used to assess specific activities (extracting and analyzing the behavior pattern).

Procedure

The experiment was conducted in three, two-hour sessions for a total of six hours.

Session I. Upon arrival participants were advised of the responsibilities and benefits of participating in the experiment and asked to sign a statement of consent. This introduction was presented in map form. No other training with maps was provided. After consent forms were collected, subjects were randomly divided into two groups: map (n=20) and essay (n=22). Groups were separated into two rooms where the training and treatment began. First, participants were asked to examine "Analyzing Patterns of Behavior," which contained either a map or essay of a behavior pattern related to hunger and overeating. Then they completed the "Describing an Alcohol Behavior Pattern" exercise on their own patterns or on the pattern of someone they knew.

Session II. The second session began by having participants complete questionnaires over the pattern extraction activities from the previous session. Next, they were asked to read and complete the "Analyzing the Behavior Pattern" exercise.

Session III. The third session concluded the experiment with questionnaires over the behavior pattern analyses completed in Session II.

Results and Discussion

Two one-way ANOVAs were conducted for the first (extraction/ description) and second (analyses) days of the experiment utilizing the average of the questionnaire items as the dependent measure. TOOL (map or essay) served as the between groups factor.

Behavior pattern extraction. There was a significant main effect for TOOL, $F(1, 40)=6.77$, $p<.05$, $MSe=4.27$, with higher mean scores for the map group ($M=3.24$, $SD=1.58$) than for the essay group ($M=2.06$, $SD=1.68$).

Consequences and behavior pattern analyses. There was a significant main effect for TOOL, $F(1, 40)=9.20$, $p<.005$, $MSe=4.70$, with higher mean scores for the map group ($M=3.66$, $SD=1.70$) than for the essay group ($M=2.22$, $SD=1.72$).

Results of the first experiment indicate that, for both pattern extraction and pattern analysis, maps are preferred over traditional essays. These findings suggest that maps are potentially useful tools for illuminating destructive patterns of behavior in a self-counseling process.

EXPERIMENT 2

Methods

Subjects

Thirty-eight (male=14, female=24) from upper-division psychology courses at Texas Christian University participated for extra credit.

Materials

Training materials. The training materials consisted of both a completed sample behavior pattern map and essay and a completed sample "Map/Essay

Evaluation Questionnaire." The example was a behavior pattern concerning hunger and overeating.

Stimulus materials. The stimulus materials all were adapted from behavior pattern maps and essays concerning alcohol that had been completed by college students participating in another study. The packet of stimulus materials consisted of four items arising from the complete crossing of maps and essays as extraction tools and maps and essays as presentation tools: a) a map that was extracted via mapping and presented as a map, b) a map that was extracted via essay writing and converted to a map, c) an essay that was extracted via essay writing and presented as an essay, and d) an essay that was extracted via mapping and converted to an essay.

Evaluation materials. The evaluation materials consisted of four "Map/Essay Evaluation Questionnaires" and the "Pattern Evaluation Study Post-Experiment Questionnaire." The "Map/Essay Evaluation Questionnaire" consisted of two questions, each on an eight-point Likert scale. The questions were as follows:

1. How effective would this tool (map or essay) be as a guide to be used during a counseling session with this person?

2. How well does this tool help you identify any gaps or inconsistencies in this person's understanding of his/her behavior pattern?

The consumer satisfaction questionnaire (Pattern Evaluation Study Post-Experiment Questionnaire) consisted of five questions to assess the overall impact of the activities in the experimental sessions. Four of the questions asked participants to evaluate both essays and maps on an eight-point Likert scale. These questions were as follows:

1. How much new information did you learn about alcohol-related behaviors?

2. Did the activities help you identify any gaps in your knowledge about alcohol or alcohol-related behaviors?

3. How strongly would you recommend these activities to help educate college students about alcohol-related behaviors?

4. How effective do you think these tools would be as aids to a counseling session?

The fifth question asked participants to simply check which tool (essay or map) they would prefer to use as an aid in a counseling session.

Procedure

The experiment was conducted in two, two-hour sessions for a total of four hours.

Session I. Upon arrival, participants were advised of the nature of the experiment and the requirements and benefits of participation. This information was presented in the form of maps. No other map training was provided. Participants then completed a statement of consent to their participation. After consent forms were collected, participants received a packet of training materials. The training materials consisted of a sample pattern essay and pattern map and a sample "Map/Essay Evaluation Questionnaire." Participants were allowed 20 mins to familiarize themselves with the behavior pattern formats (essay and map) and the "Map/Essay Evaluation Questionnaire."

Session II. (Two days later). Upon arrival for the second session, participants were asked to review the sample materials they had examined during the first session. Next, participants were given 45 mins to examine and

evaluate the stimulus materials (2 essays and 2 maps). A final consumer satisfaction questionnaire concluded the session.

Results and Discussion

Map/Essay Evaluation Questionnaire

A two-way ANOVA was conducted on the Map/Essay Questionnaire data. PRESENTATION TOOL and EXTRACTION TOOL served as repeated measures and the mean of the two questions on the survey served as the dependent measure. A significant main effect for PRESENTATION TOOL was found, $F(1, 37)=4.11$, $p<.05$, $MSe=1.85$, with maps displaying higher means ($M=5.00$, $SD=1.45$) than the essay groups ($M=4.56$, $SD=1.85$). A significant PRESENTATION TOOL X EXTRACTION TOOL disordinal interaction was indicated, $F(1, 37)=11.70$, $p<.005$, $MSe=1.89$. The stimulus that was both extracted by and presented as a map received the highest ratings ($M=5.45$, $SD=1.39$), followed by the stimulus that was extracted by a map and presented as an essay ($M=4.87$, $SD=1.80$), the stimulus that was extracted by and presented as an essay ($M=4.55$, $SD=1.37$), and the stimulus that was extracted by an essay and presented as a map ($M=4.24$, $SD=1.86$).

Consumer Satisfaction (Post-Experiment Questionnaire)

A t-test was conducted comparing maps and essays on the mean ratings of questions one through four on the consumer satisfaction questionnaire. Maps received significantly higher scores, $t_{(76\ df)} = -2.06$, $p<.05$, than did essays with means of 4.37 ($SD=1.50$) and 3.71 ($SD=1.32$), respectively.

A X^2 test on the final question ("Please place a check by the tool you would prefer to use as an aid in a counseling session") produced a X^2 $(1,\underline{N}=38)=11.1$, $\underline{p}<.005$. Twenty-eight people preferred the maps and eight people preferred the essays.

The results of the second experiment indicate that maps are viewed as powerful extraction and presentation tools for self-related information about alcohol behavior patterns in a peer counseling situation. Not only were maps preferred as counseling tools, they also were evaluated more favorably than essays in identifying gaps in knowledge and providing new information about alcohol-related behaviors.

General Discussion

The findings from the present studies indicate that schematic knowledge maps are potentially powerful tools for both self- and peer counseling. For self-counseling, maps were preferred over traditional essay writing for both the problem definition/extraction and the problem analysis phases of resolution. In addition, the subjective reaction to maps as tools for peer counseling was positive.

Before an individual can begin to resolve a conflict, it is necessary to have an adequate representation or definition of the problem. Similar to medical symptoms, personal problems (specifically those stemming from alcohol use) are embedded within complex systems of behavior. Schematic maps provide a means of both extracting and analyzing information about personal episodes that is otherwise disorganized and difficult to access. By using these tools, a counselor (either self or peer) is able to gain an understanding of the "big picture," to see precipitating factors, exit routes, and warning signs.

Overall, these findings suggest that further examination be conducted exploring the use of schematic knowledge maps as counseling tools. The next phase might be to have trained clinicians utilize these tools as roadmaps in counseling sessions or as diagnostic materials. It is suspected that their usefulness in extracting and analyzing behavior patterns as peer and self - counseling tools will generalize to the domain of expert counseling.

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Figure Captions

Figure 1. Knowledge map.

Figure 2. Link types.

Figure 3. Schematic knowledge map.

KNOWLEDGE MAPS

C — Have multiple processing routes

C — Less word clutter than text

C — Contain spatial/graphic and verbal information

C — Presumably compatible with human memory

L — A wide range of applications

Ex — Use as educational tools

Ex — Use as research tools

L

I
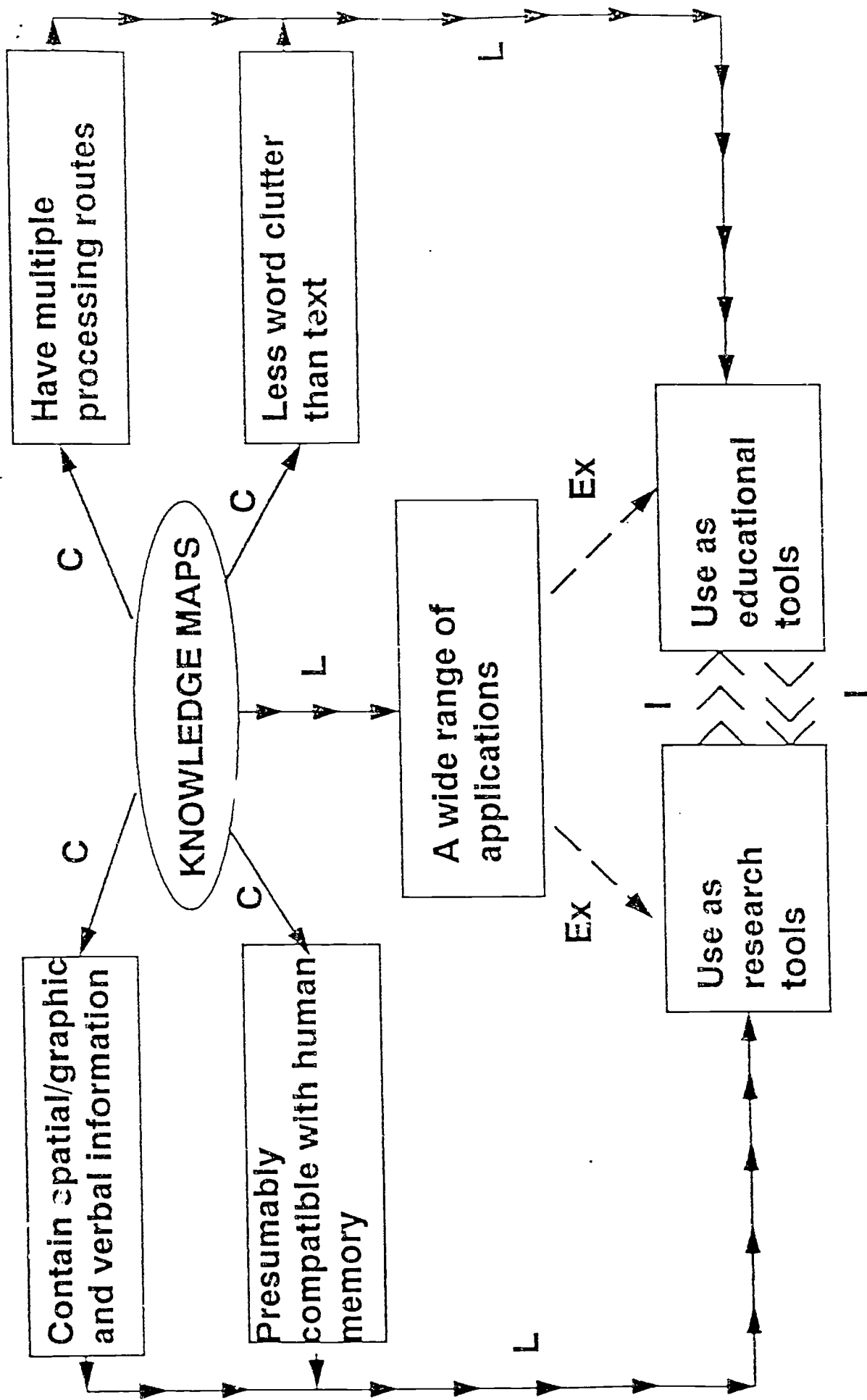
	NAME	SYMBOL	EXAMPLE	INTERPRETATION
DYNAMIC	LEADS TO	→→→→→→ (L)	(Intense studying) →L→→ (Good grades)	"intense studying leads to good grades."
	NEXT	→→→→→→ (N)	(Brush your teeth) →N→→ (Comb your hair)	"First brush your teeth, and next comb your hair."
	INFLUENCES	> > > > > > (I)	(Anxiety) >I>>> (Test performance)	"Anxiety influences test performance."
DESCRIPTIVE	TYPE	—T—→	(Dog) —T→ (Poodle)	"One type of dog is a poodle." [Notice that the link name is used first in creating sentences involving descriptive links.]
	PART	—P—→	(Dog) —P→ (Tail)	"One part of a dog is its tail."
	CHARACTERISTIC	—C—→	(Most Dogs) —C→ (Bark)	"A characteristic of most dogs is that they bark."
ELABORATIVE	EXAMPLE	- - - - - →	(Poker hand) -Ex→ (Three aces, a 3, and a Jack)	"An example of a poker hand is three aces, a 3, and a Jack." [Notice that the link name is used first in creating sentences involving elaborative links.]
	ANALOGY	- - - - - →	(Hangover) -A→ (Being stuck in a clothes dryer)	"An analogy to a hangover is being stuck in a clothes dryer."
	COMMENT	- - - - - →	(They should pay teachers less) -Co→ (ABSOLUTELY NOT)	One comment about the idea that they should pay teachers less is "ABSOLUTELY NOT."

OUTSIDE THINGS THAT INFLUENCE THE PATTERN

LEGEND
Type Influences
and Leads to

INHERITED CHARACTERISTICS; OTHER PEOPLE'S EXPECTATIONS; WORK PRESSURE; COMPETITION; CUES ASSOCIATED WITH CERTAIN SITUATIONS (e.g., a party, the library)

THE WAY FAMILY MEMBERS AND FRIENDS DEAL WITH NEEDS AND WANTS; SOCIAL SUPPORT FOR PARTICULAR DECISIONS

OTHER PEOPLE WHO SUPPORT OR INHIBIT PARTICULAR ACTIONS

OTHER PEOPLE'S REACTIONS AND FEEDBACK

NEEDS OR WANTS MAY START THE PATTERN

DECISION/PLAN TO DEAL WITH THE NEEDS OR WANTS

ACTIONS

DIRECT CONSEQUENCES OF THE ACTIONS

GOOD

BAD

AWARENESS OF NEEDS OR WANTS?

AMOUNT OF THOUGHT PUT INTO DECISION/PLAN?

HOW WELL DID THE ACTIONS FIT THE PLAN?

IDEAS ABOUT THE BALANCE BETWEEN IMMEDIATE AND LONG-TERM NEEDS AND WANTS; ANTICIPATION OF FUTURE NEEDS AND WANTS

KNOWLEDGE OF DIFFERENT WAYS OF SATISFYING NEEDS OR WANTS; GENERAL ABILITY TO PLAN

AMOUNT OF SELF-AWARENESS AND SELF-CONTROL; AWARENESS OF CONSEQUENCES; ABILITY TO MONITOR ONESELF AND KEEP "ON TRACK"

IDEAS ABOUT HOW MUCH PEOPLE ARE RESPONSIBLE FOR THEIR ACTIONS AND THE CONSEQUENCES THEY RECEIVE

THOUGHTS AND FEELINGS THAT INFLUENCE THE PATTERN

OUTSIDE THINGS THAT INFLUENCE THE PATTERN

OTHER PEOPLE'S REACTIONS AND FEEDBACK | THE WAY FAMILY MEMBERS AND FRIENDS DEAL WITH NEEDS AND WANTS; SOCIAL SUPPORT FOR PARTICULAR DECISIONS | OTHER PEOPLE WHO SUPPORT OR INHIBIT PARTICULAR ACTIONS

CONSEQUENCES OF REPEATING THE PATTERN

GOOD

BAD

DECISION/PLAN TO MAINTAIN OR CHANGE PATTERN

ACTIONS

IDEAS ABOUT HOW MUCH PEOPLE ARE RESPONSIBLE FOR THEIR ACTIONS AND THE CONSEQUENCES THEY RECEIVE

KNOWLEDGE OF DIFFERENT WAYS OF SATISFYING NEEDS OR WANTS; GENERAL ABILITY TO PLAN

AMOUNT OF THOUGHT PUT INTO DECISION/PLAN?

HOW WELL DID THE ACTIONS FIT THE PLAN?

AMOUNT OF SELF-AWARENESS AND SELF-CONTROL; AWARENESS OF CONSEQUENCES; ABILITY TO MONITOR ONESELF AND KEEP "ON TRACK"

THOUGHTS AND FEELINGS THAT INFLUENCE THE PATTERN

LEGEND
Influence
Level 10