

# THE FRAMEWORK FOR A MODEL OF PSYCHOANALYTIC INFERENCE

VIRGINIA TELLER AND HARTVIG DAHL

SUNY DOWNSTATE MEDICAL CENTER

BROOKLYN, NEW YORK

## ABSTRACT

Although theoretical propositions in the field of psychoanalysis ultimately rest on the empirical base of claims by individual psychoanalysts about their intuitive understanding of the utterances of individual analysands, there is as yet no significant scientific theory that accounts either for the analyst's ability to understand or for how he does so. Our claim is that these intuitions can be represented by a two-stage model whose first step consists of classificatory processes and whose second step is essentially that of inductive inferences. We shall present our case by discussing three levels of structure to be found in the discourse of a patient in psychoanalysis: the surface TEXT, the classification of this text in Linguistic MAPS and Personal Event FRAMES derived from the maps.

Although theoretical propositions in the field of psychoanalysis ultimately rest on the empirical base of claims by individual psychoanalysts about their intuitive understanding of the utterances of individual analysands, there is as yet no significant scientific theory that accounts either for the analyst's ability to understand or for how he does so. That he can recognize complex structured patterns in what a patient says is widely assumed, and it is thought to be a skill that improves with experience. Arlow (1979) described the clinician's view of how these cognitive processes work:

... the analyst organizes the myriad bits of data transmitted by the patient into meaningful configurations by the process of intuition, that is, he conceptualizes the data outside of the realm of consciousness. He becomes aware of his conclusions through the process of introspection, through which he discerns the end product of his intuition (p. 81, italics added).

Our claim in this paper is represented in Figure 1, in which three levels of structure to be found

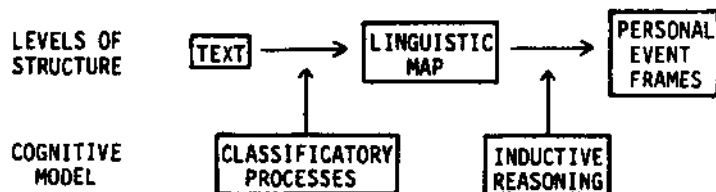


Figure 1.

in the discourse of a patient in psychoanalysis are related by a two-stage cognitive model whose first step consists of classificatory processes and whose second step is essentially that of inductive inferences. The three levels of structure are: (1) TEXT - the surface structure of the discourse with all its disfluencies as revealed in transcripts; (2) MAPS - the structure of the text after its elements have been classified in Linguistic Maps, which are a preliminary set of categories of the content and/or other features of the text; and (3) FRAMES - the structure of abstract event sequences called Personal Event Frames (PE Frames), which are derived from the linguistic maps.

## TEXT

Our data are taken from verbatim transcripts of tape-recorded psychoanalytic sessions. These have been exhaustively proof-listened and punctuated so that, sort of a phonemic rendering, their reading is as close to a translation of the auditory record as we are capable of. In the passages that we shall use as examples it is our judgment that the intonations and other speech characteristics would not significantly alter any of our observations or conclusions. As psychotherapy researchers who have examined transcripts know, the spontaneous speech of a person in psychotherapy is full of disfluencies unusual even for spoken discourse. It is riddled with sentence fragments and false starts, with syntactic and semantic anomalies and with idiosyncrasies and ambiguity. The text we shall examine is a three-paragraph excerpt from the fifth hour of the psychoanalysis of a young schoolteacher:

f 18. *Because I, I (chuckle) was just thinking I probably do the same thing with David. Last night in particular, I was talking with him about — I don't know, I just seemed to be in a funny mood by the time he got home. He got home sort of late, and it wasn't that he was late, because I knew he would be. But I guess he didn't immediately respond to me in the way I wanted him to or — I don't know what it was, because I imagine that somehow I was already in some kind of a mood. And (sniff) at one point I was talking to him, and I know I was talking to him wanting either confirmation that I'd done the right thing or a suggestion on what would be a right thing because I wasn't sure. I was upset about something I'd done and I didn't want him just to listen to me say it. I wanted him to actually react to it, and either suggest another course of*

action or, or approval that well, I gueee that in the circumstances that wasn't that bad a thing to do. And, anti he just didn't eay anything, except sort of mutter under hie breath. And eo I got furious at him and (eniff) I imagine in a way it's the same kind of thing that my father always is doing. (Pause, stomach rumble.)

I 19. Because the thing I did that — it wasn't that important a thing I did that I was upset about, but it was indicative of something I'm doing all the time — was, uhm, the particular incident was, I have two boys in school who are constantly together. They were friends before. And it's disruptive to the class now because they're, whenever we're doing some kind of a group activity, they're so busy moving around inside the group, staying together and then changing places in the — if we're sitting on the f— floor up in the front they'll be changing places where they're sitting — and so they sort of tunnel through the whole group and they're talking together and everything. And it really isn't good for them anyway, just in their cutting out other people so that they are only together within themselves. And I'm trying to encourage them to separate themselves from each other as much as possible. And once in a while if I'm really tired and worn-out and there they are disrupting the group again, I get a little annoyed at them on — again, though I know I shouldn't.

I 20. And yesterday — I had been thinking about calling the parents — and yesterday — just to let them know that, if the children were kind of upset at what I was doing, the reason for it would be this, and that they, if they wanted to support it, they could by explaining that there were lots of boys to be friends with at the school and that type of thing. And — but I hadn't called them — and I saw one of the mothers at the dismissal when she came to pick up her boy. And I never like talking to parents then because it was just too confusing. But of course I just said something to her that was, you know, chatty. And then, and then I suddenly found myself starting to talk about this problem, which I hadn't intended to at all. And I, I was kind of surprised at myself when I was talking and, then I just couldn't keep quiet (chuckle). I couldn't stop it, or say well, we better talk about this another time or anything. And I just seemed to get in deeper and deeper and I'm always doing this.

#### LINGUISTIC MAPS

The technique of producing linguistic maps arose out of a need to understand some puzzling features of this text; the solution lay in finding a special way to classify the information and represent it. Categories of information in the sequential text are mapped into a structure designed to enhance the clarity of the content and to facilitate the recognition of the "meaningful configurations" sought by the clinician. The procedure for constructing a map is straightforward. Sequential elements of the text are placed into columns in such a fashion that each column constitutes a particular category of information, e.g. a continuity of manifest theme, a set of particular syntactic or semantic features, parenthetical comments of the same type, etc.

There are no restrictions except that the nature of the elements in a single column be describable. When an element of text does not fit in an existing column a new column is added to the map. Thus there is a one-to-one mapping of the textual elements into a structural form with the sequential information retained.

The adequacy of the mapping can be assessed according to the two general principles that Rosch (1978) has proposed for the formation of categories of any type:

The first has to do with the function of category systems and asserts that the task of category systems is to provide maximum information with the least cognitive effort; the second has to do with the structure of the information so provided and asserts that the perceived world comes as structured information rather than as arbitrary or unpredictable attributes (p. 28, italics added).

Figure 2 (which requires exceptional eyesight or a magnifying glass) shows the linguistic map we constructed for paragraphs 18, 19 and 20. A pattern emerges from this map that was not readily detectable in the original text. Reading down the columns, we see that the patient is basically relating an incident at school, but she interrupts the narrative to mention other aspects of the situation as well. The "structural" hypothesis formalized in this linguistic map is that the patient is not talking about one subject but nine different subjects. The predominant feature of the map, however, is the patient's hesitant manner of reporting what happened at school. A mere glance at Column 3 makes it immediately and visually clear that the patient delayed in telling the analyst what actually occurred. Indeed the first element in Column 3 (168,3) is a deleted reference to the event! And this is followed by ten more unresolved or partially resolved forward references before she finally (202,3) tells something of what she did that she was upset about (183,4). So a clear puzzle emerges: Why did the patient delay telling the analyst?

We shall return to this question later with a hypothetical answer that emerges out of our linguistic map and frames we derive from it. But now we need to examine Figure 2 more carefully and describe some of its properties. First of all, as we have already seen, this map is a dramatic way to represent a puzzle visually as well as linguistically. Second, the map permits us (for example, by reading down a column) to see the "structured information" in the connections among previously discontinuous elements.

Third, in the process of constructing the map we are forced, because they stand as clues to the indication of a new category, to focus on certain linguistic features that might otherwise be overlooked. For example, elements (185,3) and (185,5) read in part, "... the particular incident was, I have two boys in school who are ... ". Here the incompatibility of the tenses leads us to infer that the information about the two boys is background for the incident at school.

A fourth property of the map is reflected in the

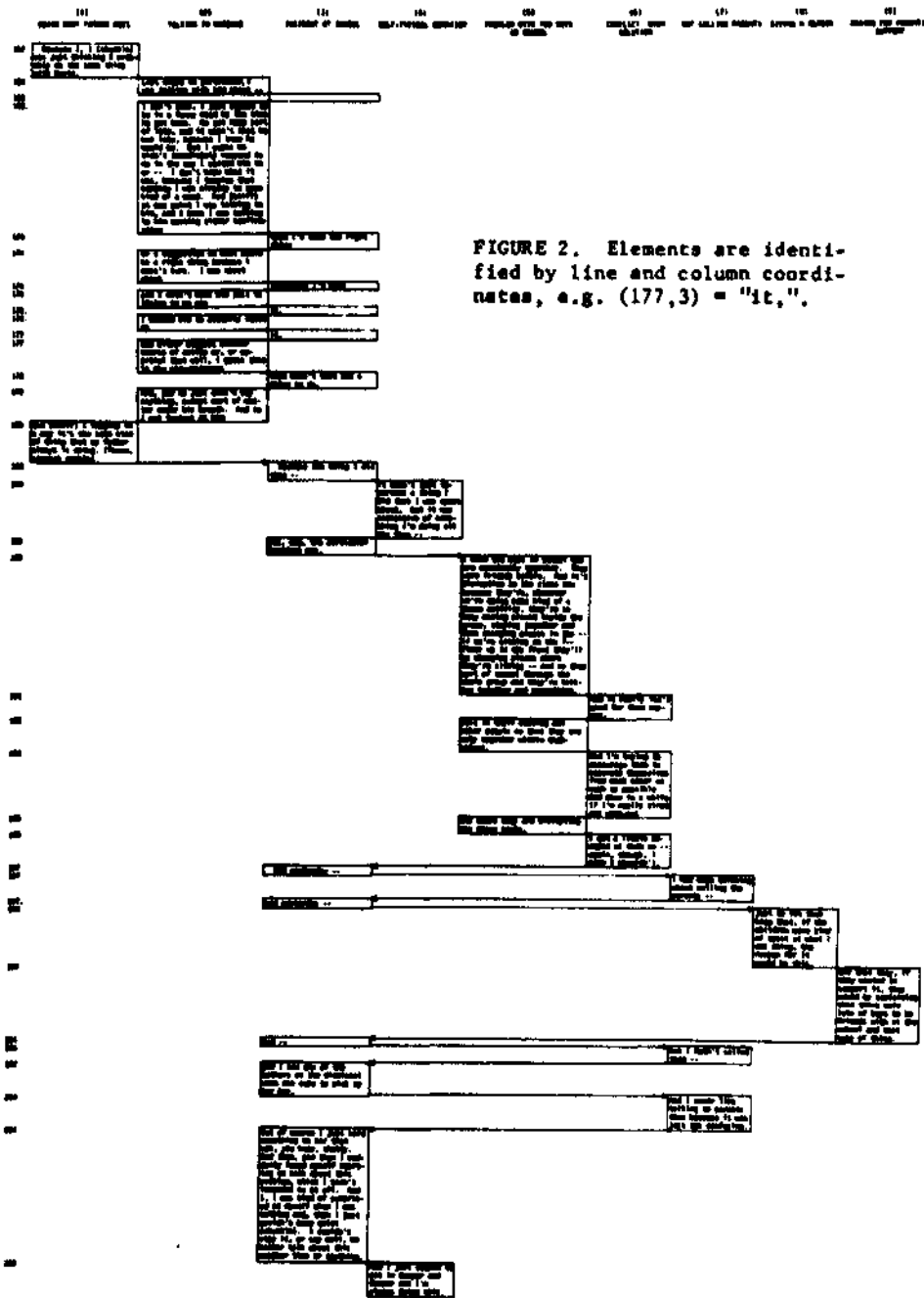


FIGURE 2. Elements are identified by line and column coordinates, e.g. (177,3) = "It."

inal text. One strength of maps is that they tend to reveal theoretical biases rather than mask our preconceptions so that we might take them into explicit consideration. By providing "maximum information with least cognitive effort" maps have made possible the identification of Personal Event Frames.

#### FRAMES

We have taken part of our title as well as the concept of frames from Minsky (1975) who proposed them as a means of representing in computer programs knowledge of stereotyped situations in the real world. In his favorite example of a child's birthday party, matters such as dress, food and presents are terminals with default assignments based on the stereotyped expectations associated with such parties. Thus the default for dress is, for a little girl, her Sunday best and the default for food is ice cream and cake, etc.

According to Minsky:

Much of the phenomenological power of the theory hinges on the inclusion of expectations and other kinds of presumptions. A frame's terminals are normally already filled with "default" assignments. Thus, a frame may contain a great many details whose supposition is not specifically warranted by the situation. These have many uses in representing general information, most-likely cases, tech-

choice of titles for the columns, which, with two exceptions, are phrases from the content or close paraphrases. We now believe these titles accord with Roach's general principle that certain types of "categories tend to become defined in terms of prototypes or prototypical instances that contain the attributes most representative of items inside and least representative of items outside the category" (p. 30).

A fifth characteristic of the map is that it is an attempt to cut at the joints, to dissect along natural tissue boundaries, to uncover some of the inherent manifest structure embedded in the orig-

niques for bypassing "logic," and ways to make useful generalisations.

The default assignments are attached loosely to their terminals, so that they can be easily displaced by new items that better fit the current situation. They thus can serve also as "variables" or as special cases for "reasoning by example," or as "textbook cases," and often make the use of logical quantifiers unnecessary (pp.212-213).

We became interested in frames because we recognized an analogous problem in representing stereotyped, repetitive sequences of events in the behav-

ior of individual people. It seemed to us that the features of Minsky's system were adaptable to representing the analyst's knowledge about these repetitive event sequences that are so characteristic a part of every analyst's report of the events in his personal life. The cast may change, the situations may vary, but the plots endure with structural tenacity.

Our decision to try to adapt frame theory to our needs is a very recent one, resulting from a recognition that we had no systematic way to represent the repetition of event sequences. The terminology we have adapted from Minsky is as follows:

- PERSONAL EVENT FRAME - representation of a repetitive event sequence.
- EVENTS - elements in a personal event frame that must be filled by specific instances or data.
- PROTOTYPE - the first identified PE frame with justification from the data for each event.
- INSTANTIATION - any subsequent occurrence of a PE frame with evidence for each event from the data.
- EXPECTED VALUE - the value of an event given in the prototype frame.
- DEFAULT ASSIGNMENT - the expected value of an event that is used when a given instantiation does not provide a value.
- VARIABLES - all of the events in a frame that can assume different values.
- FRAME SYSTEM - a set of frames with shared events.

Figure 3 schematically represents two PE Frames, one entitled DELAY and the other SUPPORT. Each PE frame consists of a series of EVENTS joined by arrows indicating a fixed sequence of occurrence. EVENTS include wishing, believing, perceiving, feeling, thinking, acting, etc. The phrase in each EVENT box partially describes the DEFAULT ASSIGNMENT, which is derived from the EXPECTED VALUE of the corresponding EVENT in the PROTOTYPE frame. Repetitions of a frame, whether with the same of different objects, are called INSTANTIATIONS.

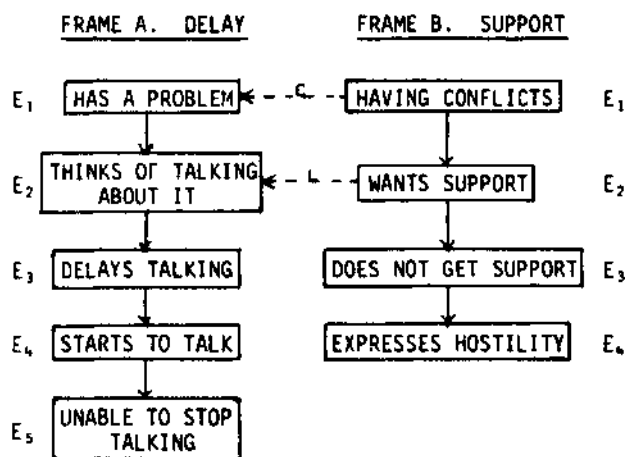


Figure 3.

Taken together, these two frames comprise the simplest case of a FRAME SYSTEM because they have overlapping events. These are indicated by the dotted lines between corresponding events in the two frames. Having Conflicts overlaps the set of Having a Problem; and Wanting [to ask for] Support

is a subset of Thinking of Talking.

The prototypes for Frame A (Figure 4) and Frame B (Figure 5) were derived from the manifest content of two reports by the patient of behavior that she herself regards as self-typical behavior. All of the content for the Frame A prototype follows line 183 on the map and is bracketed by the statements, "... it was indicative of something I'm doing all the time" (183,4) and "I'm always doing this" (209,4). The corresponding content for the Frame B prototype precedes line 183 and begins and ends with the comments, "I probably do the same thing (167,1) ... that my father always is doing" (180,1).

The DELAY frame prototype in Figure 4 illustrates the essentials of the method. First, the five events are abstracted from the narrative; in this case the patient's description of her behavior with the boys and their parents is abstracted into the five-event sequence. The next step is to provide justification for the existence of each event in the form of documentation from the manifest data in the map. In creating the prototype frame we require that justification of some type be given for each event. When available, statements that imply a warrant for making an inductive generalization are also included; these are examples of the kind of additional information that can be attached to a frame.

Two instantiations each are given for Frame A and for Frame B. In these cases, instead of including data to justify the existence of the events, evidence to support a repetition of the events in the frame is specified. The requirements here are more relaxed than for the prototype, and we have permitted what we call indirect evidence from which we can (with some probability) make an inference as evidential support. When no evidence can be found the Default Assignment is assumed (see Fig. 4, Instantiation 1, Event 5).

A major strength of our proposal lies in the nature of the predictions that can be made from the prototype frames. The prototype, in effect, constitutes a hypothesis that, together with a warrant for generalization, entails a prediction that the same sequence of events will occur again. Thus, instantiations, to the degree they can be documented, confirm the prediction and may be thought of as providing corroborative evidence for the prototype frame. In addition the frame concept constrains what will be considered evidence of instantiation in two important ways. First, the particular events in an instantiation must be similar to the corresponding events in the prototype, e.g. the patient may report chatting instead of talking. Second, the events must occur in the sequence given in the prototype. Each successive event in a frame, in other words, is conditional upon its predecessors.

With this point in mind, let us return to the question posed earlier — Why did the patient delay in telling the analyst about the incident at school? Three relevant contextual facts were presumptively known to both the patient and the analyst at this time: first, the analyst had told the patient during the first analytic session to "say whatever you're thinking out loud;" second, in this session the analyst had said nothing prior to this text and had said very little during the first four hours;

PROTOTYPE: Boys/Parents

1. JUSTIFICATION FOR PROBLEM

(185,5) I have two hoys in school who are constantly together ... and it's disruptive to the class.

(191,6; 192,5) And it really isn't good for them anyway ... they are only together within themselves,

(196,6) I get a little annoyed at them ... though I know I shouldn't,

(204,3) I suddenly found myself starting to talk about this problem.

2. JUSTIFICATION FOR THINKING OF TALKING

(197,7); 198,8; 199,9) I had been thinking about calling the parents — just to let them know ... that there were lots of boys to be friends with at the school and that type of thing.

3. JUSTIFICATION FOR DELAY

(201,7) ... but I hadn't called them.

(204,3) I suddenly found myself starting to talk about this problem, which I hadn't intended to at all.

4. JUSTIFICATION FOR STARTING TO TALK

(204,3) I just said something to her that was, you know, chatty.

(204,3a) And then, and then I suddenly found myself starting to talk about this problem.

5. JUSTIFICATION FOR INABILITY TO STOP

(204,3) And I, I was kind of surprised at myself when I was talking.

(204,3a) And then I just couldn't keep quiet (chuckle). I couldn't stop it or say, well, we better talk about this another time or anything.

WARRANT FOR INDUCTIVE GENERALIZATION

(183,4) It wasn't that important a thing I did that I was upset about, but it was indicative of something I'm doing all the time.

(209,4) And I just seemed to get in deeper and deeper and I'm always doing this.

+ \* \*

INSTANTIATION 1: Talking to Husband

1. EVIDENCE FOR PROBLEM

All of the elements in JUSTIFICATION FOR PROBLEM in FRAME A, PROTOTYPE, STEP 1 (above).

2. EVIDENCE FOR THINKING OF TALKING

INDIRECT:

(168,2) I just seemed to be in a funny mood by the time he got home.

(168,2a) It wasn't that he was late, because I knew he would be.

(168,2b) I imagine that somehow I was already in some kind of a mood.

(176,2-3) I was upset about something I'd done. INFERENCE: P was thinking of talking about the problem at school with her husband while waiting for him to come home.

3. EVIDENCE FOR DELAY

Delay imposed by husband, who "got home sort of late."

4. EVIDENCE FOR STARTING TO TALK

(174,2-3) And (sniff) at one point I was talking to him, and I know I was talking to him wanting either confirmation that I'd done the right thing or a suggestion on what would be a right thing because I wasn't sure.

5. EVIDENCE FOR INABILITY TO STOP

NONE

. \* .

INSTANTIATION 2: Talking to Analyst

1. EVIDENCE FOR PROBLEM

- A. Problem with two boys at school.
- B. Conflict over solution of problem at school.
- C. Problem with mother at dismissal.
- D. Dissatisfaction over talk with husband.

2. EVIDENCE FOR THINKING OF TALKING

(168,2) I was talking with him about — INDIRECT:

P has been told to "say whatever you're thinking out loud."

3. EVIDENCE FOR DELAY

A. P refers to the incident 11 times before relating it to the analyst.

INDIRECT:

B. Although the incident occurred before the session the day before, P did not mention it in the previous session.

4. EVIDENCE FOR STARTING TO TALK

(183,2) Because the thing I did that — (185,5) The particular incident was, ... (197,3) And yesterday — (197,3a) And yesterday — (201,3) And —

5. EVIDENCE FOR INABILITY TO STOP

(202,3) And I saw one of the mothers at the dismissal when she came to pick up her boy.

(204,3) But of course I just said something ... chatty ... and then I suddenly found myself starting to talk ... And I, I was kind of surprised at myself ... and then I just couldn't keep quiet ...

(209,3) And I just seemed to get in deeper and deeper and I'm always doing this.

Figure 4.

and third, the incident at school happened before the analytic session on the previous day, i.e., the patient had had the opportunity to mention it during the fourth session but had not done so. Now consider Instantiation 2 of the Support frame (Figure 5). This instantiation differs from the others in that it is an hypothesized instantiation, and it contains a feature we have not used until now, namely predictions of events to come. It is precisely

one of these predictions that forms the basis for our explanation of the original puzzle.

According to the prototype, any unfolding of the Support frame must consist of, first, the patient being in a state of conflict and second, wanting support in dealing with the conflict. We have good evidence for conflict (Event 1) and reach the inductive conclusion that she wants support for her actions from the analyst (Event 2) but here the

PROTOTYPE: Talking to Husband

1. JUSTIFICATION FOR CONFLICT (Statements about "the thing I did")  
 (174,2-3) ... confirmation that I'd done the right thing or a suggestion on what would be a right thing because I wasn't sure.  
 (176,2-3) I was upset about something I'd done,  
 (178,3) ... that wasn't that bad a thing to do.  
 (183,4) It wasn't that important a thing I did that I was upset about, but it was indicative of something I'm doing all the time.
2. JUSTIFICATION FOR WANTING SUPPORT  
 (174,2-3) I was talking to him wanting either confirmation that I'd done the right thing or a suggestion on what would be a right thing.  
 (176,2) I didn't want him just to listen to me say it. I wanted him to actually react to it.  
 (176,2; 178,3) I wanted him to ... either suggest another course of action or, or approval that, well, I guess that in the circumstances that wasn't that bad a thing to do.  
 (PRESUPPOSITION: Approval is one kind of support.)
3. JUSTIFICATION FOR NOT GETTING SUPPORT  
 (176,2) I didn't want him just to listen to me say it. I wanted him to actually react to it.  
 (179,2) And, and he just didn't say anything, except sort of mutter under his breath.
4. JUSTIFICATION FOR HOSTILITY  
 (179,2) And so I got furious at him.  
 WARRANT FOR INDUCTIVE GENERALIZATION  
 (167,1) I probably do the same thing with David.  
 (168,2) Last night in particular, I was talking with him.  
 (180,1) And I imagine in a way it's the same kind of thing my father always is doing.  
 \* \* \*

INSTANTIATION 1: Boys/Parents

1. EVIDENCE FOR CONFLICT  
 All of the elements in JUSTIFICATION FOR PROBLEM in FRAME A, PROTOTYPE, Step 1 (above).  
 (198,8) If the children were kind of upset at what I was doing, the reason for it would be this.  
 (PRESUPPOSITION: Ambiguity in pronoun reference reflects a conflict.)
2. EVIDENCE FOR WANTING SUPPORT  
 (197,7; 198,8; 199,9) I had been thinking about calling the parents, just to let them know that ... if they wanted to support it [what I was doing'], they could by explaining ...

text ends. Nonetheless, the expected value for Event 3 supplies the default value as a prediction:

PREDICTION: The patient expects to not get support from the analyst.

And therefore, we hypothesize, she adopted a compromise solution: the delay dramatically apparent in Column 3, coupled with the elaborate background and justifications in Columns 5 through 9. Simply put, her delay can be stated as a symptomatic com-

3. EVIDENCE FOR NOT GETTING SUPPORT  
 (197,7) I had been thinking about calling the parents ...  
 (201,7) but I hadn't called them.
4. EVIDENCE FOR HOSTILITY  
 NO EVIDENCE FOR OVERT HOSTILITY. EVIDENCE FOR COVERT HOSTILITY:  
 (202,3) I saw one of the mothers at the dismissal.  
 (203,7) I never like talking to parents then because it was just too confusing.  
 (204,3) But of course I just said something to her that was ... chatty.  
 (204,3a) And then I suddenly started to talk about this problem, which I hadn't intended to at all.  
 (204,3b) And then I couldn't keep quiet (chuckle). I couldn't stop it or say, well, we better talk about this another time or anything.  
 INFERENCE: Blurting out the problem to the mother at the dismissal, presumably in front of children and other parents, and being unable to stop, even though she felt it was an inappropriate time, is a covert act of hostility toward the mother.  
 \* \* \*

HYPOTHESIZED INSTANTIATION 2: Talking to Analyst

1. EVIDENCE FOR CONFLICT  
 All of the elements in FRAME B, PROTOTYPE and INSTANTIATION 1, Step 1 (above).
2. EVIDENCE FOR WANTING SUPPORT  
 A. P has expressed a wish for husband's approval (i.e. support).  
 B. WARRANT FOR GENERALIZATION (FRAME B, PROTOTYPE) suggests this is self-typical behavior.  
 C. P has expressed a wish for support from the boys' parents.  
 D. People in general want support when they are in conflict, i.e. this is "group-typical" behavior.  
 INDUCTION: P WANTS SUPPORT FROM THE ANALYST.  
 . . . . . (end of p 20) . . . . .
3. EXPECTED VALUE: NOT GETTING SUPPORT = DEFAULT ASSIGNMENT.  
 PREDICTION: P expects to not get support from the analyst.  
 CONTEXTUAL EVIDENCE: The analyst has not said anything up to this point in the session.
4. EXPECTED VALUE: HOSTILITY = DEFAULT ASSIGNMENT.  
 PREDICTION: P will express hostility, either overt or covert toward the analyst.

Figure 5.

promise between her desire for the analyst's approval and her expectation of not receiving it.

Inevitably this proposed explanation has the formal form of what psychoanalysts call a "transference" interpretation since the patient's delay is explained as an action directed toward the analyst. Our method has provided two reasonably precise transference predictions about events to come, namely, statements by the patient at some later time — perhaps in the same session, perhaps not.

The second of these is conditional upon the first: If P feels she has not gotten support from the analyst, then she will express some form of hostility toward him. And we can examine our transcripts (and their maps) for statements bearing on these two predictions. (In this instance, both predictions were confirmed.)

#### CONCLUSION

We have gone into a lot of detail in order to illustrate the method of constructing maps and frames and to demonstrate the function of each in representing these two kinds of knowledge that we have postulated to underlie an analyst's intuitions. We find it quite astonishing to discover so much detailed and definable structure in just three short paragraphs comprising less than 1/10,000th of the total analysis. But the true potential of this approach lies in the developments of frame systems with overlapping events. Even in the narrow domain we have examined there is at least one additional frame on the theme of TOGETHERNESS, and it clearly shares the Conflict event with the Support frame. If we enlarge our domain to include the entire session and other sessions, it is easy to find variations on the theme of Delay by substituting for the action of talking actions such as touching, telephoning, shopping and sexual activity. Moreover we also find variants in which another person (e.g. father, mother) replaces the patient as subject as well as instances in which the objects of the action are variables (e.g. husband, analyst, etc.). Taken together these variants would constitute a frame system on the theme; and taken with other themes with overlapping events we would have a more complex and interesting frame system that might begin to approach the complexity (or simplicity) of an analyst's actual representation of such patterns.

What analysts refer to as unconscious fantasies could readily be represented as a frame system in which the patient is unaware of the connections among events in event sequences or of the relationships among different instantiations or different frames in the system. We would want to examine the text for childhood instantiations that

would give us clues to the origins of the default assignments. Minsky's description of the consequences of early childhood conflicts can hardly be improved upon:

... default assignments would have subtle, idiosyncratic influences on the paths an individual would tend to follow in making analogies, generalizations, and judgments, especially when the exterior influences on such choices are weak. Properly chosen, such stereotypes could serve as valuable heuristic plan-skeletons; badly selected, they could form paralyzing collections of irrational biases. Because of them one might expect, as reported by Freud, to detect evidences of early cognitive structures in "free association" thinking (pp. 228-229).

We have postulated that the main function of the mapping stage is that of classification, a sorting out of the interlocking narratives and the undoing of the surface disfluencies and discontinuities to establish the connectedness of the seemingly disconnected elements. We have further proposed that this classification facilitates the second step of the cognitive process, which is to identify the relatively invariant structured sequences of events that are repeated over and over with symbolically equivalent expressions of the events, repeated with subjects and objects of the action as variables. Our basic claim is that these PE frames stand as the basis for inductive inferences, for the predictions entailed in them and for the organizing of the data for their confirmation or disconfirmation.

#### REFERENCES

- Arlow, J. (1979) Discussion — The role of empathy in the psychoanalytic process. Bulletin of the Association for Psychoanalytic Medicine, 18:81-82.
- Minsky, M. (1975) A framework for representing knowledge. In: The Psychology of Computer Vision, P. Winston, (Ed.) New York: McGraw-Hill.
- Rosch, E. (1978) Principles of categorization. In: Cognition and Categorization, E. Rosch & B. Lloyd (Eds.). Hillsdale, NJ: Lawrence Erlbaum.