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ON THE CONSTRUCTION OF A SIMULATION OF THE INITIAL PSYCHIATRIC INTERVIEW

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PREFACE

Situations of complexity and uncertainty comparable to those encountered in a psychiatric interview are fairly common in the business and military spheres, and here the technique of mathematical simulation has provided much valuable insight. In this Memorandum, the authors describe their construction of a simulation of an initial psychiatric interview, which can be regarded as an example of an adaptive, multistage decision process. The purpose of this research is to augment current methods of teaching psychiatric interviewing and to provide an additional tool for exploring basic problems of two-person communication.

ACKNOWLEDGMENTS

It is a pleasure to acknowledge our indebtedness to K. Colby for the stimulating ideas contained in his papers and books [6], [7], and to two important texts--one by Gill, Newman, and Redlich [8], and the other by Strupp [9]--which supplied the initial interview that we have cannibalized and then built upon. We also wish to express our thanks to a number of friends and colleagues who have patiently listened to our ideas over the past years.

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INTRODUCTION

In an effort to augment current methods of teaching psychiatric interviewing and to provide additional research tools for the exploration of basic problems of two-person communication, we have turned to certain concepts, theories, and procedures which have been applied with success in such scientific domains as physics and engineering, as well as in the areas of economics, operations research, and social science. Situations of complexity, uncertainty, and significance comparable to those encountered by the psychiatrist are not uncommon in the business and military spheres, and here sophisticated mathematical techniques, combined with the power and versatility of digital computers, have provided much valuable insight. Furthermore, these techniques have furnished a systematic means of carrying out extensive, and relatively inexpensive, experimentation.

The key to a mathematical approach for the handling of processes in these highly nonnumerical domains has been the technique of simulation [1], [2]. In order to make use of this flexible and versatile tool, we propose that psychiatric interviewing can be regarded as a multistage decision process, and that insight into this process can be obtained by means of the basic ideas of dynamic programming [3,4,5].

In Part I, we present a nontechnical lexicon of fundamental concepts in the theory of dynamic programming, and

discuss their relevance to psychiatric interviewing. In Part II, we describe the simulation process we have constructed, using a digital computer, and some excerpts from it. In Part III, we discuss the ideas guiding our construction. Finally, in the last section of Part III, we list some of the uses of simulation processes as pedagogical and research tools; these suggest some of the many variations and extensions that are possible.

I. PSYCHIATRIC INTERVIEWING AS A MULTISTAGE DECISION PROCESS

1. DECISION PROCESSES

In the preceding section it was proposed that psychiatric interviewing be recognized as a multistage decision process of adaptive type. A decision process is an activity or a situation involving a decision. This decision may be a simple dichotomy, yes or no; for example, the psychiatrist may decide either to accept a patient or to refer him to another doctor. It may be a quantitative decision, such as the number of days a week a patient is to come, or it may be both quantitative and qualitative, such as the choice of a drug and the extent to which it is to be used, or the decision to employ a reconstructive therapeutic approach instead of a supportive therapeutic approach.

The decision may also be one of a higher level of sophistication, as for example a decision to postpone a decision until a later date when more information is available. There are many different types of decisions, and also many different levels of decision-making that occur

within the psychiatric interview. These decisions produce an outcome, or an effect, which can be evaluated in operational terms.

2. MULTISTAGE DECISION PROCESS

A multistage decision process is a decision process involving a sequence of decisions over time, or space, or a combination of the two. In the present case, time is the essential parameter. Typically, the process unfolds in the following fashion: a decision is made and an event then occurs, which causes a change both in the system and in the environment. As a consequence, further information is obtained. Then another decision is made, another event occurs, and so on until the process ceases. Since this study is limited to the initial interview, the process terminates after a specific time.

Many of the familiar games of our society are examples of multistage decision processes: chess, checkers, poker, and bridge. Baseball and football involve sequential decision-making, as does the favorite indoor pastime, investment in the stock market.

3. INFORMATION PATTERN

As in the classical sciences, it is desirable to be able to describe the state of the decision process at any time. The expression information pattern will be used to denote the accumulation of information concerning the patient, the therapist, and the possibilities for patient-therapist interaction at any particular time. Information

generally considered important for the therapist to elicit has been discussed in detail by Alexander and Ross [10], Noyes and Kolb [11], Wolberg [12], Freud, et al. [13], Menninger [14], Bibring, et al. [15]. Information considered important for the patient to elicit from the therapist has also been reported in detail by Lennard and Bernstein [16], Grinker [17], Ruesch [18], Sullivan [19]. Such information tells what the therapist may expect from the patient and what the therapist may offer him to help alleviate whatever he considers his problems.

Upon the basis of the information pattern, decisions are made (consciously or unconsciously), such as the questions asked, the drugs prescribed, the number of sessions allotted, and the techniques used. Since the consequences of decisions are events, which in turn provide additional material for the information pattern, we clearly have a "feedback process," wherein decisions influence the information pattern and conversely.

Dynamic programming is a mathematical formulation of the feedback process that arises naturally in multistage decision processes.

4. POLICY

A policy is a settled course of procedure which determines what decision is to be made on the basis of the available information pattern. In simple terms, a policy tells us what to do next in terms of where we are and what we know.

There are various types of interviewing policies. One policy would be for the psychiatrist to say and do

almost nothing in the course of the interview. Other policies that he might follow are: to ask set questions independent of the responses of the patient; to repeat the last sentence or phrase of the patient; to limit his verbalizations to encouraging but nonspecific phrases such as "uh-huh" or "I see." More complex policies involving the actual information pattern are: repetition of key words of the patient, repetition of word descriptions of the patient's affective state, or a varying mixture of these policies; see [20-26].

Indeed, one of the purposes of developing simulation processes is to provide a tool for the identification and testing of different types of policies.

An optimal policy is a policy which produces optimal results. Such a policy requires some specific preassigned criterion for total success. We shall not attempt to arrive at optimal policies in the situation we are considering, for to do so would be naive, arbitrary, and inflexible. Instead, we shall concern ourselves more realistically with the determination of feasible and effective policies, and, at very least, the avoidance of ineffective policies.

5. ADAPTIVE MULTISTAGE DECISION PROCESSES

It is useful at this point to distinguish several different types of multistage decision processes. All, of course, are only approximations to the true complexity of nature, both inanimate and human. The basic problem confronting the scientist is always to choose the most appropriate approximate model (i.e., replica) of nature that can be efficiently treated by the few tools he may

possess, and that will simultaneously yield information commensurate with the effort which has been expended.

The simplest and most classical processes are those where all of the properties of the system are well-known and the objectives are precise. Any complexity here arises from the requirement that a long series of rather simple decisions be made.

The game of chess furnishes a typical example of such a process. An even better example is the Japanese game of Go.

Another example, taken from the engineering field (to which we shall return below), is that of determining an optimal trajectory for a spacecraft travelling from the earth to the moon. Here "optimal" may be defined in terms of time, fuel, weight, money, or combinations of these. A useful approximation could be obtained by assuming that we are able to describe the state of the ship at any time, in terms of position, velocity, spin, fuel, etc. Furthermore, we assume that we can describe cause and effect, such as the results of change in direction, the gravitational pull of the earth, moon, and sun, an increase in fuel consumption, and so on. Granted all of this precision, there are still formidable analytic and computational difficulties in determining optimal trajectories.

In many cases, use of this classical deterministic process does not yield results that agree sufficiently with observation and experiment. It then becomes necessary to introduce effects that correspond in some fashion to various uncertainties of the physical world. Here, probability theory furnishes us the mechanism, and enables us to replace

deterministic processes by stochastic processes, that is, processes depending upon chance effects. We get back to deterministic processes, however, by taking appropriate averages.

The card games of poker or bridge are common examples of stochastic decision processes, and Kriegspiel (semi-blindfold chess) is another.

There are, however, still more complicated types of multistage processes, in which even the nature of the uncertainty or the objectives of the process may not be completely known at the beginning of the process. An essential part of the decision process is the gathering of this information as the process unfolds.

Among the most complex of such multistage decision processes is that carried out by the psychotherapist dealing with a patient. To illustrate this, let us point out that initially he does not know how the patient will react to certain lines of questioning, nor indeed even effective ways of communicating with the patient--much less the "most effective" way. Until he acquires a minimum of basic information concerning the patient, he is not even certain of what his overall objective for the patient will be. As time goes on, as the patient and therapist interact and the information pattern builds up, the therapist establishes a basis on which to choose his objectives and adjusts his procedures.

A process of this type, in which policies are adapted and modified over time in accordance with increasing amounts of information, is called an <u>adaptive decision process</u>.

6. PSYCHIATRIC INTERVIEWING

The point of all of the preceding discussion has been to identify various phases of psychiatric interviewing as an adaptive decision process. For the present, we shall stay quite clear of the far more complex processes involved in continuing therapy, and concentrate solely on the first interview. Here, although he may know little or nothing about the patient, the psychiatrist must make fundamental and possibly far-reaching decisions concerning diagnosis and disposition of the case.

Let us proceed with the identification process. A new patient represents an unknown system whose present state and responses are determined step-by-step on the basis of initial questions and answers of a psychiatric session. In general, the questions that are asked are dependent upon the answers that are given. The analogy between this process and what is known in mathematics as a Markov process has been discussed by Colby [6]. The interviewing process is, however, more complex.

The questioning process itself--the eliciting of information in some reasonable fashion that will not produce undesirable side effects (such as antagonizing the patient, or suggesting or suppressing ideas) and hopefully, that will develop rapport--is not a routine matter. It is a delicate skill that has to be acquired through much conscious effort and experience [20-26].

7. SEQUENTIAL MACHINE

In connection with multistage processes, a very useful concept that may be applied to our particular

psychiatric situation is the following: Consider a system (an undefined, intuitive concept) which may be in any of a number of different states, and let us represent these states by the integers 1,2,...,N. Suppose that the various inputs to this system are numbered 1,2,3,...,M, and that the output of the system depends upon both the input and the state, a reasonable assumption. A system of this type is called a sequential machine.

Symbolically let i be the input, j be the state of the system, and o_{ij} be the output. See Fig. 1.

8. INTERACTION AND TWO-PERSON ASPECTS

An analogy with the psychiatric situation is immediate. The system is the patient, who can be in any of a number of different emotional states, or on a deeper level, suffering from any of a number of different types of illness. We can first of all consider the patient as a mechanism, a "black box" into which the therapist inserts inputs (questions) and from which, as a result, come outputs (answers). We have agreed at the moment to simplify the process by ignoring other inputs and outputs.

Some typical "diagnosis" problems are then those of determining the state of the system on a deeper level, and of choosing the inputs which will enable one to determine the original state (or subsequent succession of states) in some minimal fashion, e.g., minimum time, suffering, expense. There are many different and interesting questions concealed within this abstract formulation; see [4], where further references may be found.

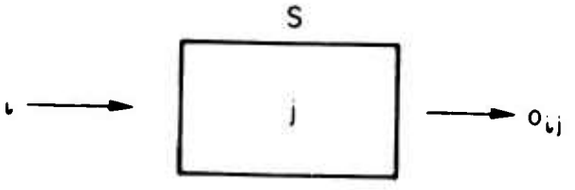

Fig. 1

Schematically, in the language of modern control theory, it appears that we have a feedback device with the therapist acting as the control unit. (See Fig. 2.) However, further analysis of the process (confirmed by detailed examination of many recorded interviews, e.g., [8], [9]), reveals that it is more realistic to suppose that both the patient and the therapist have inputs and outputs, and indeed interact to a considerable degree.

Therefore, if we consider the still undefined states of the patient and therapist as both continuously acting and reacting, then Fig. 3 is more appropriate than Figs. 1 or 2.

In mathematical terms, we have two sequential machines interacting. Consequently, the therapist is conceived of not only as a control unit, but also as a variable unit himself, an unknown whose state requires as much investigation as that of the patient, regardless of the completeness of his own personal analysis. This has been more and more recognized in recent years [9,28].

As we shall see below, there is an analogy between the behavior of patient-therapist and the interaction of two coupled oscillators. Usually the behavior pattern of one or the other will gradually take over and the two will then operate in a common manner, either effective or ineffective.

9. DISCUSSION

No one pretends that mathematics, computers, and the like will be more than aids to the principal efforts of psychiatric training. One must constantly keep in mind

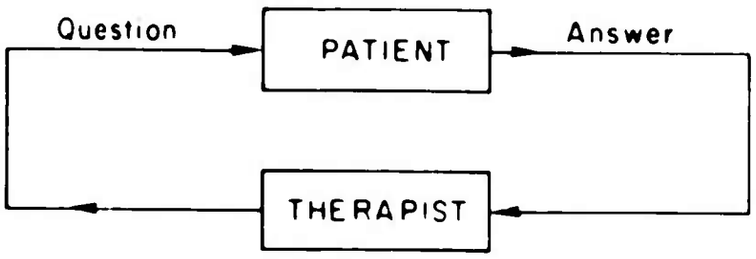

Fig. 2

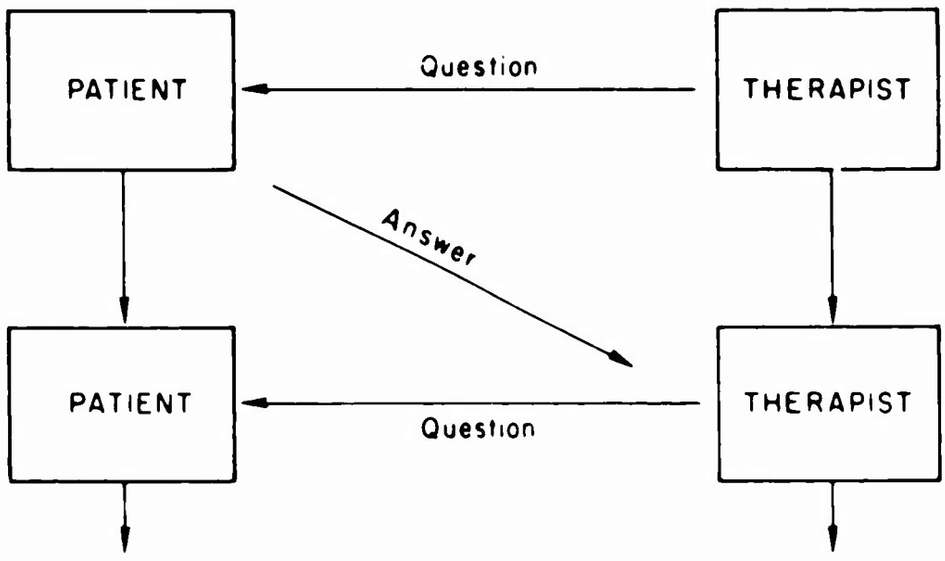
PATIENT
Question
THERAPIST
Answer
PATIENT
Question
THERAPIST

Fig. 3

the major difficulties that exist in this field. Since the very programming (i.e., instructing) of the computer depends upon human observation, understanding, and evaluation, one cannot get out basically more than what is put in. If, however, by the technique of simulation and the theory of dynamic programming we can develop greater insight into the general process of two-person interaction, then the endeavor is more than justified.

Fortunately, mathematicians in recent years have been able to construct mathematical models which have been effective in formulating and treating problems in which all of the variables are partially known. It is our hope that such tools will prove to have a meaningful applicability to the problems faced in psychiatry.

In the next part of the paper, we shall briefly describe what a simulation process is, and then present the simulation of the initial psychiatric interview which we have constructed.

II. A SPECIFIC SIMULATION PROCESS

1. INTRODUCTION

In the first part of the paper, the reader was introduced to the concepts of dynamic programming in order to set the stage for the interpretation of the initial psychiatric interview as a multistage decision process. For reasons that will be examined in some detail in Part III, conventional mathematical techniques involving numbers and equations cannot be used in any fruitful fashion to continue from here at the present stage of knowledge.

Instead, we shall use the versatile format of a simulation process as the vehicle for our investigation.

Let us point out that we are using mathematical concepts in the usual fashion to make more precise certain concepts which already exist. Our simulation process thus provides a framework for operational and quantitative evaluation of contemporary qualitative ideas. Once constructed, it offers a systematic procedure for generating new ideas and new concepts which lead to further processes, and so on. This is the customary feedback between theory and practice.

The following sections are devoted to a brief discussion of what a simulation process is, what our simulation process looks like, and finally, of alternative versions and uses.

2. SIMULATION PROCESS

The existing simulation processes which have had the greatest influence upon the construction of our psychiatric simulation process are those in the business world. In particular, there is the one called the "Top Management Decision Simulation" of the American Management Association; a discussion of the ideas guiding the construction of this process may be found in [1], [2]. These economic and industrial simulation processes were, in turn, suggested and influenced by military simulation processes, called War Games; references to these may be found in [1] and [2].

A simulation process--a replica of an actual process--is used for experimental, pedagogical, theoretical, and

training purposes. Perhaps the simplest way to explain what is meant by a simulation process is by means of analogy.

Consider the situation in aerodynamics. We would like, if possible, to use physical, engineering, and mathematical theory as a basis for providing quicker, cheaper, and more efficient construction of aircraft. Unfortunately, the physical principles of aerodynamics are not altogether understood and the mathematical equations are both complex and of dubious value.

To circumvent these major roadblocks, models of devices are used, ranging from small scale to full scale, from the use of wind tunnels to test pilots. In this way, with the aid of the theory that does exist, effects of design, loading, speed, etc. can be tested and compared.

In connection with the training of human beings for various occupations, we frequently encounter simulation techniques, from Link trainers and driver-education devices to moot courts and dry runs.

Likewise, the simulation processes of the business and military world are models of the actual processes, used to test policies, equipment, leadership, ability, reaction under pressure, and so on. The use of digital computers has made it possible to construct quite realistic simulations which can be carried out in a reasonable time.

For further details, see [1], [2], where additional references may be found.

3. PSYCHIATRIC-INTERVIEWING SIMULATION PROCESS

The objective of the process we shall describe below

is to augment clinical training in conducting the initial interview, with particular reference to questioning policies.

The trainee assumes the role of the therapist, and the digital computer, suitably instructed by a program, replies as a particular patient would. Subsequently, we shall explain how it is that the computer may be programmed so as to represent a range of types of patients.

The process begins with the trainee instructed to proceed as if the simulation were an actual interview, with the exception that questions and answers will be relayed to and from the "patient" by intermediaries. As in actual practice, the trainee is given some initial information concerning the patient, ranging from the simple fact that he has an appointment at a given time to the results of medical and psychological examinations, and so forth.

Having been given some time to absorb this information, the "interview" begins with the trainee given a choice of a number of initial questions. When he selects a particular question, this question is relayed to the computer, which produces an answer. How this is done will be described briefly below, and in more detail in Part III. In addition, a set of possible second questions is provided, and so on. (See Fig. 4.)

The mechanism for the production of answers is quite simple. Each question has a set of associated possible answers stored in the computer, together with a mechanism (set of instructions) for choosing a particular answer. The program has been carefully designed to simulate a

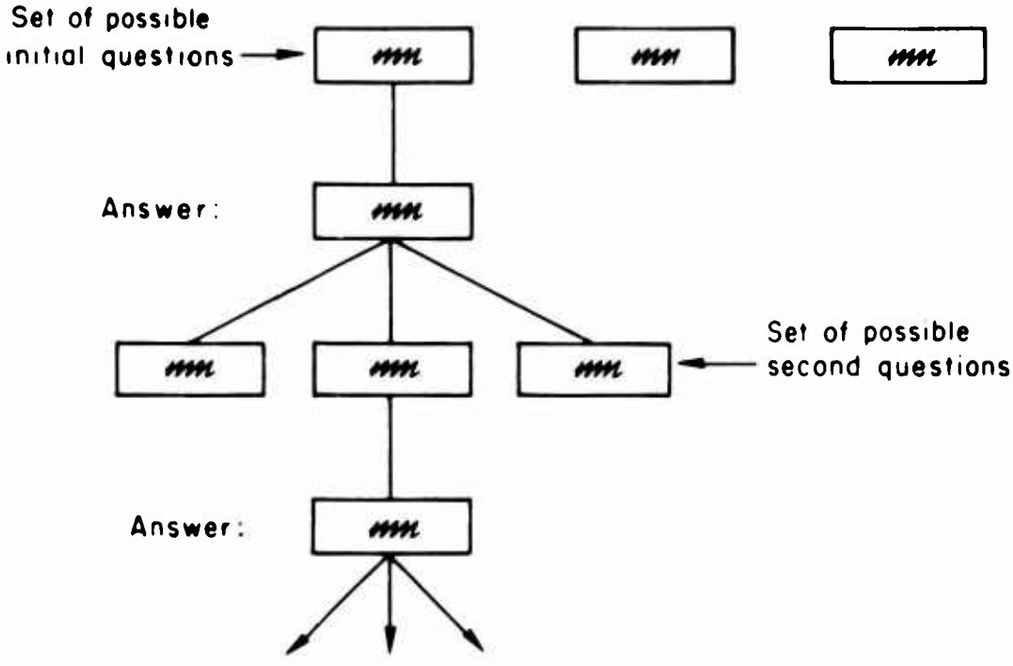
Set of possible
initial questions
Answer:
Set of possible
second questions
Answer:

Fig. 4

specific type of patient with characteristic personality traits, possible mood shifts, and susceptibility to chance influences. How this is done will be discussed in Part III.

The "interview" continues for as many stages and responses as desired. In practice, there are serious difficulties encountered in composing and storing the tree of possible questions and answers, and in instructing (programming) the computer. As mentioned above, we used a particular interview appearing in both '8' and '9' as a skeleton for our process. We have, in addition, a different "patient" based upon another actual case.

4. THE ROLE OF THE COMPUTER

It is well to emphasize that the computer plays no "intelligent" role in this process. It is merely a convenient device for storing and retrieving questions and answers. Every action it takes is a direct result of a low-level specific instruction.

Simulation processes of similar nature on a smaller scale can easily be constructed with no need for mechanical dependence upon a digital computer.

5. FLEXIBILITY AND VERSATILITY

We have rather ambiguously stated that the answer to a question was made available to the trainee without indicating the actual procedure. By varying this procedure in a number of different ways, we vary the nature of the

simulation process. The simplest approach is to have the answers printed on cards which are made available to the trainee at the appropriate time.

This is the least realistic version. Let us consider briefly some modifications in the direction of verisimilitude.

To begin with, we may allow the trainee to read the answer once, within a specified time, and then ask him to return the card. Secondly, we can have the answers printed on ticker tape so that there is no opportunity to reread the answers. Thirdly, we can prepare recordings of the answers, and finally, we can use a movie screen together with the recordings.

We can also introduce trained observers with two-way phone communication with the trainee.

6. THE BEGINNING STAGES OF THE SIMULATION PROCESS

In Fig. 5, we exhibit the first stage of one of our interviews. Across the top line we have the set of possible initial questions, and directly below each question, we have the possible answers.

7. RELATED SIMULATION PROCESSES

Having decided upon the format and the set of questions and answers, we have nonetheless a great deal of freedom remaining. Suitably combining and permuting these degrees of freedom, we can generate a large number of related simulation processes. These will differ in so many essential ways that the same trainee can carry out these

I am Doctor Strangelove. Would you please tell me why you have come to see me?	The purpose of this interview is to get a general idea of your problem so that we can decide the best thing for it.	What brings you here?
Everything's wrong, I guess. Irritable, tense, depressed	I feel unstable, tense, depressed. My husband's a chronic alcoholic. I feel that it is either going to ruin me or the kids or all of us	Everything's wrong, I guess; irritable, tense, depressed.
Well, the world's a pretty mixed-up place. I have problems.	I am not sure what my problems are.	Well, it's quite a long story.
I am not so sure that I can be helped.	I don't feel like talking right now.	I don't feel like talking right now.

Fig. 5

different simulation processes and gain experience from each attempt.

We can do the following:

a. Increase or decrease the initial information available.

b. Increase or decrease the set of questions and answers.

c. Change the mechanism for producing answers.

d. Change the nuances and shadings of the responses, written and oral.

Carrying out these modifications, we can test the influences of various factors upon interviewing policies and the courses of interviews. We shall discuss some further research possibilities in Part III.

8. EVALUATION

The evaluation of simulation processes, particularly those involving chance effects, is a matter of no small difficulty. At the present time, there will be a considerable subjective bias, as of course there is in the actual situation.

There are, however, indices developed empirically which can be used in evaluation. These will be discussed in some detail in Part III.

III. CONCEPTUAL BASIS OF SIMULATION PROCESS

1. GENERAL DISCUSSION

The basic events, from our point of view, are the statements made by the therapist and the responses given

by the patient. We agree with the general statement made by Gill, Redlich, and Newman [8] that during the first interview, the therapist attempts to ascertain the nature of the problem, the background history, motivation for therapy, capacity for therapy, and reality considerations--both extrinsic and intrinsic; finally, he makes the reality of the treatment situation as clear as possible, allowing for an understanding to be reached as to the next step to be taken. The questions remain, however, of what specific statements do we allow and which specific responses should we expect, and at what point in time?

Since there are uncountably many possibilities to consider, the choice is admittedly difficult. Add to this the fact that in the actual psychiatric interview there are shades of meaning and nuances, as indicated by voice tones, facial expressions, body movements, and so on, that cannot easily be represented in print.

In order to obtain a hint as to how to proceed, let us examine what is done in mathematical physics. Suppose we are interested in constructing a mathematical model of the path of a particle, or of a spaceship which we wish to consider as a particle. An actual trajectory, say from the earth to the moon, may have the form of Fig. 6.

To simplify the process, both for ourselves and for a digital computer, we make all variables discrete. In other words, instead of a curve that turns continuously from E to M in Fig. 6, we consider a broken-line curve as pictured in Fig. 7. What we have done is to consider only a finite number of possible positions for the "point" at a fixed set of times, and to allow only a finite number of

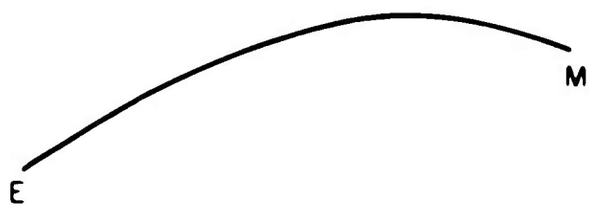

Fig. 6

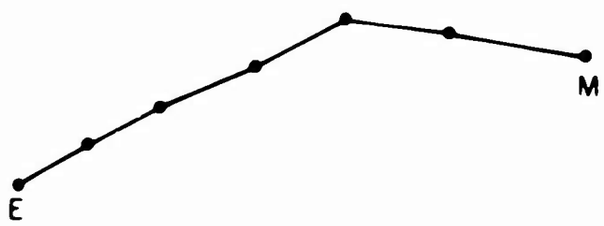

Fig. 7

possible directions and velocities at each point on the path. In order to determine an optimal path, we then have merely to choose from among a finite set of broken-line paths, as represented by the arrows in Fig. 8.

It may still be that if we allow ten different directions at a point, the number of possible paths is too large to consider effectively. Hence, we simplify in the crudest possible way by allowing only <u>two</u> different directions at a point, straight up and straight across. (See Fig. 9.)

It turns out that if the time between successive positions is small, we obtain an excellent approximation to the actual trajectory in this fashion; see Fig. 10. Observe that the actual trajectory (the dotted line) is the averaged curve.

Many other examples of this type of simplification and approximation can be given. As a matter of fact, mathematical physics is based upon the tacit assumption that these techniques are applicable. A corollary of this attitude is the principle that in studying processes, it is not the possibly complicated nature of individual events which causes complexity, but rather the combination of a large number of effects, both simple and minor.

The philosophy expressed above will permit us to introduce a number of simplifying approximations concerning description, cause and effect, and objective, and yet to be confident that the policies of the approximating process--our simulation of psychiatric interviewing--bear a useful resemblance to the interviewing policies used in clinical and office practice.

Fig. 8

Fig. 9

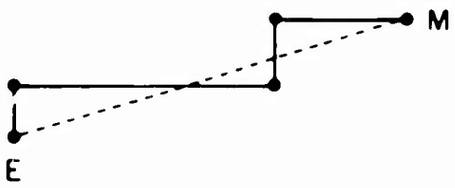

Fig. 10

2. CHESS AND GO

The game of chess is an example of a game (a multistage decision process) in which each individual move is simple. It is the staggering number of possible sets of moves that furnishes the complexity. An even better example is Go, where the pieces are all the same and the moves are the same.

While the decision-making required in chess has often been compared to that required in psychiatry,* a game that offers a closer analogy is Kriegspiel (semiblindfolded chess), where there are the additional elements of uncertainty and learning.

Note further that in both chess and Go, even a few initial moves establish trends that are virtually impossible to reverse. We also found this to be a common occurrence in the many verbatim records of initial interviews we examined.

3. FUZZY DESCRIPTIONS AND AVERAGING

In the trajectory process used above for illustrative purposes, we simplified by making the process discrete (i.e., composed of distinct parts) over time, and by reducing the number of possibilities at each stage. Once these approximations are made, we are left with a precise

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*Freud said '29', "Only the opening and closing moves of the game admit of exhaustive systematic description, and the endless variety of the moves which develop from the opening defies description; the gap left in the instructions can only be filled in by the zealous study of games fought out by master hands."

mathematical process of conventional nature. In many situations, however (as for example, the present one), we cannot even guarantee that.

If we try to define exactly what we mean by the emotional state of the patient or the therapist at any time, we find that we begin to accumulate a very large number of quantifiers, with little assurance that this increase in complexity offers any increase in accuracy of description.

Let us then boldly agree to approximate to the description of the emotional state, not only in the sense that there are to be simplifications, but also with the understanding that there are inaccuracies which we accept, and which we hope play a small role in the carrying out of the process. Again, we use a concept from mathematical physics, that most important notion of <u>stability</u>. It is easy to conceive of many situations where small errors made at each stage accumulate to the point where there is a major source of error. It is also easy to think of many physical processes where these small errors do not accumulate, or are cancelled out, or else are corrected for from stage to stage. If a flexible questioning policy is used, which is to say, if we take account of the full power of the feedback concept, we can expect stability.

Once again, we expect to find that the large number of stages in the simulation process will balance out the imprecision of a single stage, as they do in real life. Observe that we are using an averaging approach, an idea we shall mention again below in connection with evaluation.

We shall employ one type of approximation in our choice of state variables, and entirely different types of approximation in connection with the determination of appropriate answers for specific questions, that is, of cause and effect.

4. ATTITUDES

The process of psychotherapy is a dyadic situation, in which the patient seeks relief from a combination of symptoms and behavior patterns that create feelings of pain and unhappiness, and the therapist seeks accordingly to provide an environment, physical and emotional, in which this can be accomplished.

The concomitant psychological interaction affects both the patient and psychiatrist. How do we describe this effect and how do we indicate the change in effect from stage to stage? This is a fundamental problem about which much has been written [22,24,25].

The interview may be regarded as a series of couplets--question-and-answer sequences--in which the verbal behavior of both therapist and patient is graded against a reference system that describes the qualitative measure of progress of the interview. This reference system is described by three attitudes: "convergent," "ambiguous," and "divergent."

We postulate that a primary function of psychiatry is to make the patient cognizant of his external behavior and his internal emotional attitudes, and of the interactions between them. Consequently, a response that furnishes further information and demonstrates increasing recognition, understanding, and self-awareness is called convergent.

The patient must involve himself in self-scrutiny. This involves acknowledgments of his discomforts and the recognition of his liabilities and his assets. It is not enough to single out only his frailties and liabilities, for it is the evoking of awareness of his own resources and capabilities that allows for change to take place.

The issue of therapy is not that the psychiatrist should know all about the patient, but rather that the patient should know enough about himself so that he can engage in more effective decision-making based on calculated risk-taking. When the risk-taking operations are calculated, rather than blind and desperate, the uncertainties of life are brought under some kind of effective control.

A convergent response by the therapist is one that facilitates the patient's inventory taking. While the patient's response is convergent, the therapist's convergent verbal behavior is largely encouraging and the message is to "continue." He uses a nonspecific pump-priming, giving information only when the patient seriously falters, and at the end of the interview he effects a disposition of the case.

An ambiguous response by the patient is one that exhibits circling, stalling, and misdirection. A therapist's ambiguous responses represent attempts to control, placate, stalk, or outwait the patient.

A divergent response by the patient is one that manifests a refusal to communicate, an avoidance of self-awareness. A therapist's divergent response is one that clearly aims at overwhelming, rejecting, or punishing the patient.

In presenting more specific criteria for our categories, we are most aware that there are many more facets to human communication than those considered here. We also realize that the therapist's clinical judgment is considerably influenced by such factors as the patient's referral source, symptoms, age, appearance, socioeconomic level, education, work, past history, and present situation. We found, however, both in the studying of verbatim interview records and in developing simulation processes, that by holding largely to commonly accepted operational considerations, we were eventually able to predict the outcome of sets and series of sets of therapist-patient interactions with significant accuracy and agreement.

We considered the patient's communication <u>divergent</u> if he exhibited one or more of the following sets of reactions:

1. Incoherent, long silences, especially in response to direct questioning; persistent use of brief (six words or less) general answers; ignored the therapist and spoke in own vein.

2. Overt persistent hostility (scorn, accusations); repeated or prolonged outbursts of disruptive, or consistently inappropriate, affect.

3. Bizarre word use, fragmented phrases, marked hesitation, greatly reduced recall, dramatic nonsequiturs, delusional or hallucinatory ideas.

4. Obvious avoidances, contradictions, inconsistencies, or frequent shifts to unrelated subjects.

5. Numerous negations ("I don't know," "I can't think," "I don't remember," etc.), frequent blocks.

6. Repeated imperatives (commands, demands); persistent suspicion.

7. Preoccupation entirely with immediate symptoms or self; denial of difficulties; discussing only others; projection ("injustice-collecting").

8. Premature termination of interview.

We considered the patient's communication ambiguous if he demonstrated more than one of the following sets of reactions:

1. Moderate hesitation, occasional silences and incomplete phrases, persistent laconic responses, disorganized and distant references, caution, constriction, paucity or scatter, disinterest.

2. Sarcasm, excessive humor, persistent agitation or apathy, teasing, coyness, emotionalism.

3. Repeated negations, doubting ("I'm not sure," "maybe," "I guess," "I suppose so"), questioning (examining the examiner) demands.

4. Frequent use of uncommon words, obscure metaphors, conditioning clauses, reversals ("but"), absolutes ("always," "never," "every," "all," "only," "none," etc.), cliches, or "empty words."

5. Lengthy narrations (overdetailed, excessive repetition, "flooding" with too much information), intellectualizing, rationalizing, diffusion.

6. Subtle avoidance, contradictions, inconsistencies or shifts to related but tangential material.

We considered the patient's communication convergent if he behaved in the following ways:

1. Made clear, consistent, congruent, direct, and specific responses with only occasional hesitation. Initiated and maintained verbal action if therapist remained silent.

2. Volunteered relevant information beyond what was asked for, but refrained from "flooding" the interview with too detailed an account.

3. Did rare or no questioning of therapist; showed affect appropriate to situation and content; exhibited some humor without being entertaining; showed and spoke of emotions.

4. Showed ego-alienation of symptoms and discomfort of a moderate degree.

5. Recognized that illness was primarily due to his internal emotional problems and required psychotherapy.

6. Expressed wish to change beyond symptomatic relief.

7. Was able to reveal unflattering aspects of his self without relish or defiance, and to discuss assets as well.

Now we turn to our criteria for categorizing the therapist's communications. Again,we are indebted to Gill, Newman, and Redlich [8], Ekstein and Wallerstein [21], Wolberg [12], Strupp [25], Menninger [14], Colby [22], and others [16,17,23,30] for their detailed studies of the therapist in action.

We considered the therapist's communication <u>divergent</u> when he exhibited one or more of the following sets of behavior reactions:

1. Was cool, aloof, showed excessive and inappropriate use of sentence.

2. Made inconsistent and inappropriate comments which were unclear, incongruent, peripheral, unrelated, fragmented, incomplete, inattentive.

3. Was voluble, rambling, interrupting, domineering, dramatic, directly advising.

4. Was argumentative, sarcastic, accusatory, intolerant, stalking, harshly confronting, punitive, shaming.

5. Indulged in premature or "shotgun" interpretations.

6. Plunged repeatedly into deep dynamic material, dramatically encouraged or discouraged emotional reactions from patients, shifted frequently to unrelated areas.

We considered the therapist's communication ambiguous when he demonstrated more than one of the following sets of behavior reactions:

1. Excessive objectiveness, was methodical, exhaustive, over-detailed, pedantic, rigid, lagged in his response to the patient, struggled to hold patient to areas he wished to explore, challenged patient's motivations, nit-picked, and occasionally, was overtly suspicious.

2. Was uncertain, apologetic, placating, avoided necessary interruptions and clarifying questions, was overly sympathetic, furnished rationalizations to patient.

3. Was domineering, often took initiative from patient, asked leading questions, interrupted, completed patient's sentences, paraphrased, was opinionated, summarized prematurely, oversimplified, spoke in banalities, cliches, and jargonese. Promised "rewards" for cooperation.

We considered the therapist's communication convergent when he showed some of the following sets of reactions:

1. Was sympathetic without being solicitious, respectful, courteous, interested, kindly, attentive, encouraging with brief nonspecific phrases. Made few interruptions, some direction, but "limited" his activity to clarification of the patient's obscure thoughts and feelings.

2. Proceeded from the known to the unknown, delaying searching questions until rapport had been established (Menninger [14]).

3. Was clear, simple, appropriate, congruent, consistent, using language that matched patient.

4. Was tolerant, nonjudgmental, supportive if patient was threatened by too much affect, quietly and patiently accepting moderate amounts of affect.

5. Loosely structured his coverage of essential areas but, if necessary, postponed detailed exploration for future interviews.

It is not to be expected that it will be easy to apply these criteria mathematically. In the first place, these terms represent degrees of attitude, on scales which are not necessarily linear or even one-dimensional.

In all probability, deep and subtle questions of this nature can at best be resolved only partially, with the solution depending on a "theory-of-types" argument of the kind introduced into logic by Russell (see [27]).

We would like to point out once again that at any single stage of the interview, differences in opinion and evaluation concerning the character of an answer are not too important if the process has been constructed carefully. When we average over a large number of questions

and answers, there should be a general agreement as to what constitutes a convergent or divergent line of answers. This concept of "averaging" is basic to the evaluation of simulation processes and, indeed, to the evaluation of decision processes involving chance mechanisms and uncertainties.

5. ON BUILDING THE TREE OF QUESTIONS AND ANSWERS

Let us now turn to a brief discussion of how we constructed the questions and answers for the simulation process.

We have so far emphasized the importance of condensation of information insofar as the computer is concerned. Let us point out that this is an essential feature also as far as the trainee is concerned, and actually, of course, a most significant factor in decision-making in the real world. The art of model-making lies in the choice of description, that is, choosing what to retain and what to discard. This art is again a product not only of theory and thought, but also of experience, both in actual practice and in the construction of simulation processes; see [1], [2] for further discussion.

Two basic initial interviews were used. Both had been published verbatim in widely-circulated texts: "The Initial Interview in Psychiatric Practice," by Gill, Newman, and Redlich [8], and "Psychotherapists in Action," by Strupp [25]. In both interviews, the interaction between the therapist and patient had been the object of a careful detailed analysis, which was published with the interviews.

Considerable study of initial interviews, obtained both from published accounts and from professional experience, yielded the conclusion that for the purpose of constructing a simulation process, the most profitable method for considering therapist-patient communications was to group their interchanges into three basic general categories of responsiveness: convergent, ambiguous, and divergent. These we have described above.

In producing variations of therapist-patient interchanges from these two basic interviews, not only was the particular patient's history, character structure, language style, and emotional illness maintained, but also a specific character structure, style, and theoretical orientation for the therapist was constructed and maintained. Within these parameters, we then superimposed a number of therapist-patient combinations of responsiveness, i.e., convergent patient-ambiguous therapist, divergent patient-convergent therapist,etc.

Preliminary variations of therapist-patient interchanges were considered in three ways. First, a group of experienced interviewers, through a process of item analysis, constructed an ongoing flow of responses within the above parameters. Second, experienced actors--whom we considered to be "experienced simulators"--played the roles of the patients, after thoroughly acquainting themselves with a particular interview. This gained us a more spontaneously produced collection of therapist-patient responses, which were less subject to articulated conscious judgment. A third feasible and attractive method of tree-building would be to program the computer with above-mentioned criteria for convergence, ambiguity, and divergence.

The results of the first two of these three preliminary approaches were then subjected to further clinical and computer judgments, as well as to a number of trial runs in which other individuals, both experienced and inexperienced, "interviewed the machine." We have postponed use of the third technique until we gain more experience with the first two.

6. DETERMINATION OF CHANGE MECHANISM

We have indicated above that each question has a set of associated answers. How do we determine which answer to use? As mentioned above, in Sec. 5, we have particular patient-therapist combinations of responsiveness in mind. Hence, based upon these, we construct a most likely answer--convergent, ambiguous, or divergent--and then other possible, but less probable, answers.

The next step is to assign probabilities to these different responses. Presumably, if we understood enough about psychodynamics, we could predict the next attitude and even the information content. Since we cannot proceed on this level, we use the standard mathematical device of introducing a chance mechanism. If our mechanism is reasonably well designed, then the average behavior of the computer-patient over a long series of questions and answers will very closely approximate the actual behavior of a patient.

Since we are speaking in terms of long-term averages, we need not be too precise in our assignment of probabilities. This is quite important, since we do not possess any method for obtaining precise numbers.

Let us suppose that we assign a probability of 0.7 to the convergent response and 0.15 to each of the ambiguous and divergent responses. To choose an answer, the computer is instructed to pick a random number in the interval [0,1]. If the number n falls in the interval $0 \leq n < 0.7$, the convergent answer is given; if in $0.7 \leq n < 0.85$, the ambiguous answer; if in $0.85 \leq n \leq 1$, the divergent answer. Thus, for example, if 0.6543 is chosen, since $0 \leq 0.6543 < 0.7$, the convergent answer is given.

7. EVALUATION

We have previously mentioned the point that the trainee should be told that his performance will be judged as if the interview were with a patient. With the aid of the attitudes described above, we have a simple means of constructing a "profile" of the interview.* Thus, as indicated in Fig. 11, by indicating the successive attitudes of patient and therapist, we have a quick way of evaluating the interview and of learning a good deal about the "input-output" relationships of both patient and therapist. Furthermore, we have a simple permanent record of each interview.

Much remains to be done in this direction, and we shall return to it in subsequent papers.

8. FURTHER RESEARCH

This brings us to the matter of further research in this area. Without going into any detailed discussion,

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*We owe this important observation to Dr. Paul Brock, of the Department of Engineering, UCLA.

PROFILE OF AN INTERVIEW

TP Interchange Number	Therapist			Patient		
	C	A	D	C	A	D
1	X					X
2	X				X	
3		X			X	
4		X			X	
5	X					X
6		X			X	
7			X			X
[illegible]		X			X	
9			X			X
10			X			X

Fig. 11

C = Convergent, A = Ambiguous, D = Divergent

let us merely cite the following as possible directions for future study:

a. Use of sound and movies

b. Construction of a library of cases

c. Computer construction and analysis of processes

d. Comparisons of clinical practice

e. Pedagogical utilization

f. Design of dynamic intelligence tests.

In subsequent papers we shall discuss a number of these areas.

REFERENCES

1. Bellman, R., C. Clark, C. Craft, D. Malcolm, and F. Ricciardi, "On the Construction of a Multi-person, Multi-stage Business Game," Operations Research, Vol. 5, 1957, pp. 469-503.
2. ———, On Top Management Simulation, American Management Association, New York, 1957.
3. Bellman, R., Dynamic Programming, Princeton University Press, Princeton, New Jersey, 1957.
4. ———, Adaptive Control Processes: A Guided Tour, Princeton University Press, Princeton, New Jersey, 1961.
5. Bellman, R., M. B. Friend, and L. Kurland, Psychiatric Interviewing and Multistage Decision Processes of Adaptive Type, The RAND Corporation, RM-3732-NIH, June 1963.
6. Colby, K. M., An Introduction to Psychoanalytic Research, Basic Books, Inc., New York, 1960.
7. ———, "Computer Simulation of a Neurotic Process," Chapter 9 of Computer Simulation of Personality, John Wiley and Sons, New York, 1963.
8. Gill, M. D., R. Newman, F. C. Redlich, and M. Sommers, The Initial Interview in Psychiatric Practice, International Universities Press, Inc., New York, 1954.
9. Strupp, H. H., "Patient-Doctor Relationships: Psychotherapist in the Therapeutic Process," Experimental Foundations of Clinical Psychology, ed. by A. J. Bachrach, Basic Books, Inc., New York, 1962.
10. Alexander, F., and H. Ross (editors), Dynamic Psychiatry, University of Chicago Press, Chicago, 1952.
11. Noyes, A. P., and L. C. Kolb, Modern Clinical Psychiatry, W. B. Saunders Company, Philadelphia, 1963.
12. Wolberg, L. R., The Techniques of Psychotherapy, Grune and Stratton, New York, 1954.
13. Freud, A., "Assessment of Childhood Disturbances," The Psychoanalytic Study of the Child, Vol. XVII, International Universities Press, Inc., New York, 1962, pp. 159-174.

14. Menninger, K. A., A Manual for Psychiatric Case Study, Grune and Stratton, New York, 1952.

15. Bibring, G. L., et al., "A Study of the Psychological Processes in Pregnancy and the Earliest Mother-Child Relationship," The Psychoanalytic Study of the Child, Vol. XVI, International Universities Press, Inc., New York, 1961, pp. 9-45.

16. Lennard, H. L., and A. Bernstein, The Anatomy of Psychotherapy, Columbia University Press, New York, 1960.

17. Grinker, R. R., et al., Psychiatric Social Work: A Transactional Case Book, Basic Books, Inc., New York, 1961.

18. Ruesch, J., Disturbed Communication, W. W. Norton and Co., New York, 1957.

19. Sullivan, H. S., The Interpersonal Theory of Psychiatry, W. W. Norton and Co., New York, 1953.

20. Fleming, J., and D. Hamborg, "Analysis of Methods of Teaching Psychotherapy with Description of a New Approach," A.M.A. Archives of Neurology and Psychiatry, Vol. 79, pp. 179-200.

21. Ekstein, R., and R. S. Wallerstein. The Teaching and Learning of Psychotherapy, Basic Books, Inc., New York, 1958.

22. Colby, K. M., A Primer for Psychotherapists, Ronald Press, New York, 1951.

23. Tarachow, S., An Introduction to Psychotherapy, International Universities Press, Inc., New York, 1963.

24. Bellak, L., et al., "An Experimental Exploration of the Psychoanalytic Process," The Psychoanalytic Quarterly, Vol. 25, No. 3, 1956.

25. Strupp, H. A., Psychotherapists in Action, Grune and Stratton, New York, 1960.

26. Witmer, H. L. (ed.), Teaching Psychotherapeutic Medicine, The Commonwealth Fund, New York, 1947.

27. Bellman, R., "Dynamic Programming, Intelligent Machines, and Self-organizing Systems," Proc. Symposium on Mathematical Theory of Automata, Brooklyn Polytechnic Institute, 1962.

28. Glover, E., The Techniques of Psychoanalysis, International Universities Press, Inc., New York, 1958.

29. Freud, S., Collected Papers of Sigmund Freud, Vol. II, The Hogarth Press, London, 1949, p. 342.

30. Fenickel, O., The Psychoanalytic Theory of Neurosis, W. W. Norton Inc., New York, 1954.

SUPPLEMENTAL BIBLIOGRAPHY

Ackerman, N. W., "Selected Problems in Supervised Analysis," Psychiatry, Vol. 16, 1953, pp. 283–290.

Allport, G. W., Pattern and Growth in Personality, Holt, Rinehart and Winston, New York, 1961.

Anderson, G. L., "Procedures and Methods in Supervising Clinical Interns," J. Consulting Psychology, Vol. 15, 1951, pp. 267.

Arieti, S. (ed.), American Handbook of Psychiatry, Vol. II, Basic Books, Inc., New York, 1959.

Bachrach, A. J. (ed.), Experimental Foundations of Clinical Psychology, Basic Books, Inc., New York, 1962.

Bibring, E., "Methods and Technique of Control Analysis," Internat. J. Psychoanalysis, Vol. 18, 1937, pp. 369–371.

Blitzsten, N. L., and J. Fleming, "What is a Supervisory Analysis?," Bull. Menninger Clinic, Vol. 17, 1953, pp. 117–129.

Brosin, H. W., "Psychoanalytic Training for Psychiatric Residents and Others; The Associated Psychiatric Faculties of Chicago Experiment," Amer. J. Psychiatry, Vol. 109, 1952, pp. 188–195.

Colby, K. M., A Skeptical Psychoanalyst, The Ronald Press Co., New York, 1958.

Coleman, J. V., "The Teaching of Basic Psychotherapy," Amer. J. Orthopsychiatry, Vol. 17, 1947, pp. 622–627.

Ebaugh, F., "Graduate Teaching of Psychiatry Through Individual Supervision," Amer. J. Psychiatry, Vol. 107, 1950, pp. 274–278.

Ekstein, R., "On Current Trends in Psychoanalytic Training," in Exploration in Psychoanalysis, R. Lindner, editor, Julian Press, New York, 1953, pp. 230–265.

Fear, R. A., The Evaluation Interview: Predicting Job Performance in Business and Industry, McGraw-Hill Book Company, New York, 1958.

Fleming, J., "The Role of Supervision in Psychiatric Training," Bull. Menninger Clinic, Vol. 17, 1953, pp. 157–169.

Fleming, J., and D. A. Hamburg, "An Analysis of Methods for Teaching Psychotherapy with Description of a New Approach," Archives of Neurology and Psychiatry, Vol. 79, 1958, pp. 179–200.

Frosch, J., "Psychoanalytic Training and Practice," Annual Survey of Psychoanalysis, Vol. 1, 1952, pp. 390–398.

Gardner, G. E., "The Development of the Clinical Attitude," Amer. J. Orthopsychiatry, Vol. 22, 1952, pp. 162–169.

Gill, M., R. Newman, and F. G. Redlich, The Initial Interview in Psychiatric Practice, Internat. Universities Press, Inc., New York, 1954.

Gitelson, M., "Problems of Psychoanalytic Training," Psychoanalytic Q., Vol. 17, 1948, pp. 198–211.

Grotjahn, M., "A Note about Teaching Psychoanalysis," Samiksa, Vol. 1, 1947, pp. 39–50.

———, "The Role of Identification in Psychiatric and Psychoanalytic Training," Psychiatry, Vol. 12, 1949, pp. 141–151.

———, "Present Trends in Psychoanalytic Training," in Twenty Years of Psychoanalysis, F. Alexander and H. Ross, editors, Norton, New York, 1953, pp. 84–113.

———, "Training the Third Ear: Report on an Attempt at Teaching Conjecture in Psychotherapy," in Explorations in Psychoanalysis, R. Lindner, editor, Julian Press, New York, 1953, pp. 221–229.

———, "About the Relation Between Psychoanalytic Training and Psychoanalytic Therapy," Internat. J. Psychoanalysis, Vol. 35, 1954, pp. 254–262.

———, "Problems and Techniques of Supervision," Psychiatry, Vol. 18, 1955, pp. 9–15.

Henry, W. E., "The Language of Fantasy—A Problem in Instruction and Supervision," Amer. J. Orthopsychiatry, Vol. 23, 1953, pp. 315–321.

Holt, R. R., and L. Luborsky, "Research in the Selection of Psychiatrists: A Second Interim Report," Bull. Menninger Clinic, Vol. 16, 1952, pp. 125–135.

———, Personality Patterns of Psychiatrists: A Study in Methods for Selecting Residents, Vol. I, Basic Books, New York, 1958; Vol. 2, Edwards Bros., Ann Arbor, Mich., 1958.

Kahn, R. L., and C. F. Cannell, The Dynamics of Interviewing: Theory, Techniques, and Cases, John Wiley and Sons, New York, 1957.

Kelly, G. A., The Psychology of Personal Constructs, Vol. II, Clinical Diagnosis and Psychotherapy, W. W. Norton and Co., Inc., New York, 1955.

Kris, E., "Training in Psychoanalysis and the Development of Theoretical Concepts of Clinical Psychology," in Training in Clinical Psychology, Josiah Macy Jr. Foundation, New York, 1947, pp. 61–64.

Kubie, L. J., "Elements in the Medical Curriculum Which Are Essential in the Training for Psychotherapy," in Training in Clinical Psychology, Josiah Macy Jr. Foundation, New York, 1947, pp. 46–54.

Kubie, L. S., "Research Into the Process of Supervision in Psychoanalysis," Psychoanalytic Q., Vol. 27, 1958, pp. 226-236.

Menninger, K. A., M. Mayman, and P. W. Pruyser, A Manual for Psychiatric Case Study, The Menninger Clinic Monograph Series No. 8, Grune and Stratton, New York, 1962.

Millar, W. M., and M. Valentine, "Teaching Aids in Clinical Psychiatry," J. Mental Science, Vol. 98, 1952, pp. 477-482.

Mohr, G. J., "Psychoanalytic Training," in Twenty Years of Psychoanalysis, F. Alexander and H. Ross, editors, Norton, New York, 1953, pp. 235-241.

Osgood, C. E., Method and Theory in Experimental Psychology, Oxford University Press, New York, 1960.

Paul, L., Introductory Teaching of Psychotherapy as Extended History-Taking, presented at annual meeting, Amer. Psychoanalytic Assoc., San Francisco, 1958.

Rogers, C. R., Counseling and Psychotherapy, Newer Concepts in Practice, Riverside Press, Cambridge, Mass., 1942.

Ruesch, J., Therapeutic Communication, W. W. Norton and Co., New York, 1961.

Sandler, J., et al., "The Classification of Superego Material in the Hampstead Index," The Psychoanalytic Study of the Child, Vol. XVII, Internat. Universities Press, Inc., New York, 1962, pp. 107-127.

Schafer, R., The Clinical Application of Psychological Tests, Internat. Universities Press, Inc., New York, 1948.

Schwartz, E. K., and T. M. Abel, "The Professional Education of the Psychoanalytic Psychotherapist," Amer. J. Psychotherapy, Vol. 9, 1955, pp. 253-261.

Sloane, P., "The Technique of Supervised Analysis," J. Amer. Psychoanalytic Assoc., Vol. 5, 1957, pp. 539-547.

Stainbrook, E., "On the Structure and Dynamics of Supervision in Psychiatric Training," Psychiatric Q., Vol. 23, 1949, pp. 35-40.

Sutherland, R. L., "An Application of the Theory of Psychosexual Development to the Learning Process," Bull. Menninger Clinic, Vol. 15, 1951, pp. 91-99.

"The Menninger Foundation School of Psychiatry: The Selection of Candidates for Training in Psychiatry, Philosophy, and Methods," Bull. Menninger Clinic, Vol. 11, 1947, pp. 77-108.

Thompson, C. W., and K. Bradway, "The Teaching of Psychotherapy through Content-free Interviews," J. Consulting Psychology, Vol. 14, 1950, pp. 321-323.

Whitaker, C. A., "Teaching the Practicing Physician to do Psychotherapy," Southern Medical J., Vol. 42, 1949, pp. 893-903.

———, "Supervision of the Psychotherapeutic Process," in The Techniques of Psychotherapy, Grune and Stratton, New York, 1954, pp. 641-660.

Whitehorn, J. C., "Psychiatry in Medical Education: The Teacher Characteristics and Qualifications," Amer. J. Psychiatry, Vol. 103, 1947, pp. 446-449.

———, "The Meaning of Clinical Experience," Amer. J. Orthopsychiatry, Vol. 23, 1953, pp. 284-292.