Implications of current scientific models of schizophrenia for the training of research psychopathologists

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Introduction

In attempting to deal with the mandate of this conference -- to formulate long-term plans and policy for research, treatment, and training in schizophrenia -- it becomes necessary to separate two issues: that of strategy from that of tactics. The strategies or overall planning cannot be completely divorced from the tactics or short-range planning at this point in time, because unless we can successfully manage to have our tactics funded, strategy would be of only academic value. We shall, therefore, begin with a discussion of general strategy, and wind up with priorities for tactics. I had hoped to keep this paper on a purely academic plane, but your chairman, true to his administrative capacity, gently demanded that hierarchies of tactics and strategies be established and, to add to my discomfort, that a rationale for the hierarchies be provided.

My first and basic problem arises from the fact that I am acquainted with only one small segment of training -- that of research training, which until very recently was non-existent, since most of the older research workers in psychopathology wandered into the field by sheer chance or by default. Only now is the training of research people for psychopathology beginning in earnest, just when the market for their services is dropping. But this, hopefully, is only a temporary down-swing in the curve of development.
Let me first draw a distinction between training for research and training for service. In trying to draw a line between basic research and clinical service, no great difficulty is experienced, since clearly the two goals are quite different, the former being aimed at increasing knowledge, the latter at increasing well-being. The line of demarcation between clinical research and clinical service is more difficult to draw. We can, however, stipulate that when the primary goal of the clinician is to improve the particular patient or patients he is treating, he is offering service, whereas if he is concerned with developing methods for the eventual improvement of treatment, but not necessarily for the improvement of the individual patient under his care, he is engaging in clinical research. Such techniques as controls and other formal devices are the landmarks of clinical research insofar as these methods are not aimed directly at the improvement of the case under care.

Some History and Scientific Models in the Study of Schizophrenia

A brief glance at the history of research in psychopathology begins with the descriptive or phenomenological approach, in which the behavior symptoms and signs of schizophrenia were noted carefully and recorded. This field reached its zenith in the works of Jaspers, Kraepelin, and Bleuler and is now being coded and computerized in the systematic structured interviews of Burdock, Gurian, Spitzer, and Wing. After the advent of phenomenology, there followed investigations of brain anatomy by neuropathologists, behavioral investigations by psychologists, studies of the internal environment by biochemists, investigations of the role of genetics and more recently the social sciences.
Each of these movements left a distinct impact in its wake, and we can now note the following schools of research, each with its particular scientific model: the ecological, developmental, learning, hereditary, internal environment, and neurophysiological. (Zubin, 1969)

Before proceeding, we need one preliminary model — a model of the disorder itself, regardless of its origin. Is it a disease, a disorder, a reaction pattern, merely a deviant type of behavior in an essentially normal individual, or is it a style of life which happens to be out of step with our social-cultural mores? While training in research may be able to sidestep these issues and yet be fruitful, they may be a source of conflict in the trainee if they are not dealt with and some systematic point of view adopted. While each student will no doubt have developed some attitude towards these issues, it might be well to formulate a point of view which is compatible with each of these attitudes and yet has a certain consistency, so that a common framework can be provided. To this end, it might be well to build the following assumptions into our model of schizophrenia:

1. Schizophrenia can occur only in vulnerable individuals when subjected to either exogenous or endogenous stressors.

2. The vulnerability can be based on either genetic or environmentally induced grounds.

3. The stressors are stimuli which the individual perceives as stressful, even though other individuals may not share this perception.

4. Hospitalization and other types of treatments or non-treatments can add deviancy to the behavior of the schizophrenic or can permanently fix the patient in a deviant role.
These four assumptions can be molded into a model of schizophrenia which would have the following form: Individuals who possess vulnerability to schizophrenia will develop psychotic episodes of longer or shorter duration when subjected to stressors which elicit their vulnerability. When the episode is over, the patient returns to his premorbid level and if this level was good he can resume his place in society, more or less, and is regarded as improved or cured. If his premorbid level was poor, he may still be unable to cope when the episode passes, and it would be difficult to regard him as improved. Furthermore, because of his inability to cope, the hospital or other treatment he is subjected to may develop within him types of behavior which would tend to make him more and more dependent on hospital care.

The reason that so-called process schizophrenia has been regarded as a continuous non-remitting disorder stems largely from the observation of in-patients during the period when custodial care was the treatment mode. This form of treatment developed in many schizophrenics the syndrome known as hospitalism or social breakdown, which may be regarded as resulting from the treatment afforded by the hospital rather than from the disease itself. The gradual disappearance of much of this disturbed behavior with the opening of the hospital doors and the early return to the community is evidence for the tenability of this assumption. It is true that even today, despite the new panoply of therapies, about 25% of newly admitted schizophrenics remain chronically ill, but these, may be the patients with the very poor premorbid personalities in whom the end of the episode cannot be detected or who are catapulted into a new episode soon after the end of the previous episode. The only way to test this assumption is to provide
types of therapy which would aim not at cure of the disorder, but at the improvement of the premorbid personality up to a level which would permit once the episode is ended, the patients to cope. This, of course, necessitates an entirely new approach to treatment and to training.

This model, whose optimistic view can perhaps serve as a way of motivating therapeutic efforts in training, does not preclude any of the various etiological models, nor does it preclude different subgroups. Consequently, in the training program it is essential that the biometric findings regarding the controversy between typological and dimensional approaches be aired and presented clearly. Such an approach will eliminate much of the current confusion in diagnosis, and will permit the research psychopathologist to choose a proper framework for selection of patients for a given research and enable him to describe them with sufficient objectivity to permit replication of his findings by others.

It must be remembered, however, that description, no matter how thorough and objective, does not lead to a discovery of etiology, even though it is propaedeutic to it. For etiology we need to turn to our etiological models mentioned earlier. As in physics, where field theories of light oppose atom or particle theories, so in psychopathology we have the contrast between the ecological model on the one hand and the genetic on the other. The ecological model essentially stipulates that man's behavior is the result of the forces which impinge upon him -- the social, cultural, economic, or physical. At the other end of the spectrum we have the genetic model, which, paraphrasing Freud, states that genetics is fate. Since both of these extreme positions are occupied by straw men these days, we need the developmental and learning theory models, which lean towards the ecological
but do not ignore the genetic, and the internal environment and neurophysiological models, which, though leaning toward the genetic, do not eschew the ecological forces. (Zubin, 1969).

Training

In view of the fact that each of these etiological models bases itself in a different discipline, the question arises regarding the training of research workers in each of these models. Should we train purists in a specific discipline or should we train in all the disciplines. One might phrase the question as follows: should the resultant scientist -- the end product of our training -- be like a pure element (trained in only one discipline); like a physical mixture, with several disciplines mixed without any overlap; like an amalgam, with the disciplines held together by a common thread, such as biometrics or psychoanalysis; like an alloy, with several disciplines interwoven in an overlapping manner; or like a compound, with a suitable proportion of each discipline integrated into a totality which constitutes a new discipline -- schizophreniology.

I am willing, for the sake of crystallizing the training issue into a definitive statement, to adopt the last option -- that of declaring the existence of a new field devoted to the study of schizophrenia -- and attempt to develop a training program with a necessary compounding of the various disciplines as a background. I had originally considered, following Gene Burdock's purist but humorous suggestion, to call schizophreniology, but since we have not yet located the particular split bump on the skull where schizophrenia resides, I settled for schizophreniology. For each future scientist, one specific discipline will have a higher valence or loading.
The basic field for each scientist, be it anthropology, sociology, psychology, psychiatry, internal medicine, neurophysiology, genetics or neurology (others may be added), would be undertaken in his undergraduate courses in a suitable University department. On the graduate level, he should be exposed to a thorough first-year-level grounding in as many of the codisciplines as seems necessary for his particular needs, dictated by his basic interests and the type of problems he wishes to do research in. These studies are to be pursued in a Psychiatric Institute or similar mission-oriented institution in the field of psychopathology.

His initial post-graduate efforts should be in a problem-centered research unit suitable to his interests, where he would get actual field or laboratory exposure to a collaborative effort. Prototypes of such research units are those established by the Medical Research Council in England or the Biometrics Research Unit in the Department of Mental Hygiene in the State of New York. Here, the various staff members would represent the various disciplines that he was trained in so that he could rub shoulders and interact with each of the cognate fields in which he has an interest.

If we were to carry the chemical analogy further, we might liken the central discipline in which the future scientist is trained -- the psychopathology of schizophrenia -- as the central atom and attach to it the various cognate disciplines as radicals at various corners. Thus, each scientist would represent a different compound of carbon and cognate elements.

It should perhaps be mentioned here that since there is more to psychopathology than schizophrenia, the training we provide will have to take account of this fact. This is true if only because the problems pertaining to schizophrenia often come into sharper focus when contrasts are made with other aspects of psychopathology. While schizophrenia is unquestionably
a central concern, the scientist we train will need an understanding of the full range of psychopathology. In research training, special consideration needs to be given to research design. While courses in statistics and in research design form part of the training of all research scientists, there are special problems in psychopathology which require special attention. Among these are the technique for developing homogeneous groups, for which the tactics of the iterative method have been developed (discussed later). Another problem is posed by the need for controls of both the experimental as well as the statistical variety. Perhaps the concept of standard controls proposed in the early 50's could be revived (Zubin, 1951) (discussed later).

The rationale for the choice that I have made is as follows:

1. For the undergraduate level, there is little need for a rationale, since the choice on this level is usually a reflection of early interest patterns. Perhaps Institutes as well as Research Units should provide attractive summer vacation opportunities to give a foretaste of the atmosphere in which research in schizophrenia is undertaken.

2. On the graduate level, again, the choice needs no rationalization. However, it is important that the study be undertaken in a mission-oriented Institute which is closely connected with University Departments, so that the basic knowledge in the cognate fields can be made readily available. In a university department, the disciplinary lines are usually drawn so tightly that it would rarely be possible for a lone student to transcend the discipline boundaries. In an Institute, this is usually more easily done.
3. On the post-graduate level, it is more desirable to place the post-graduate in a Research Unit, because even in an Institute the focus is still on a single discipline rather than on a problem to be solved. Research Units are usually problem-centered rather than discipline centered, and the free coalitions between disciplines produced by problem-centered efforts leads to the best integration of the contributions of each of the disciplines to a common problem. Examples of such problem-centered efforts are not difficult to find. Thus, in search of prognostic approaches to schizophrenia some years ago, we succeeded in coralling the efforts of an anthropologist (Dr. Muriel Hammer), a behavior analyst (Dr. Kurt Salzinger), a psychophysiologist (Dr. Samuel Sutton), a sociologist (Dr. Ruth Bennett) and a psychiatrist (Dr. David Peretz). During the duration of this study, as many as a score of students received their doctorates and post-doctoral training in this problem-centered area from the disciplines of sociology, anthropology, experimental psychology, clinical psychology, social psychology, biostatistics, psychiatry, neurology, medicine, etc.

So much for the strategy of training. Now for the tactics. One of the current tactics in training is to expose the candidate to the techniques most likely to produce results in the most economical manner. Although cost accounting experts can hardly serve as a suitable criterion for research, the public funds devoted to research often have to pass such scrutiny. One of the more promising techniques that should be stressed in the high-risk population approach, because it seems to be more efficient in finding schizophrenic individuals in a given population than does the random selection
method. Another interesting development is the utilization of integrated collective groups, such as unions or church groups or social-fraternal clubs that have an individual personal concern for each member and his family. A study which concentrates on the total family in a group of mutually concerned families may be able to elicit information and knowledge not available in randomly selected populations. While random samples may give a better idea of incidence and prevalence on measures that have already been developed, the devising of new techniques and methods can be developed in better fashion in naturally occurring groups. It is interesting to note that Kinsey was a proponent of this method and utilized it to great advantage. For working with such natural groups, special preparation of research workers is a must.

In dealing with the improvement of the premorbid personality in order to develop better coping capacity when a patient with a poor premorbid personality is released, behavior analysis methods based on learning theory approaches seems to be the most suitable. Examples of such approaches are the techniques utilizing videotaping for self-observation and self-correction in resocialization (Albert, Elumenthal, and Silverman). Special training in determining target symptoms for improvement is most essential.

In developing better techniques for classification of patients into homogeneous subgroups, the iterative method stressed by Sutton should be introduced. In this method, the classification and diagnosis is first made on the basis of the usual clinical judgment. Then a systematic structured interview is applied which can be computerized, and a computer-produced diagnosis is provided. The psychological, psychophysiological, biochemical needed or whatever technique is applied, and the group is classified on the basis of
their performance on the technique in question. Then, the profiles on the
dimensions provided by the interview of those whose performance on the
laboratory techniques was quite similar are examined to see what dimensions
they have in common. With this iterative method, it was discovered that
subjects who have a very short critical duration for integration of light
(Bunsen-Roscoe Law or Bloch's law) are primarily schizophrenics who score
high on the thought-disordered dimension, while those schizophrenics whose
critical durations are within the normal range do not belong to the thought-
disordered group.

Another useful tactic that needs stressing is the provision of standard
control groups. In the early 50's, in order to lessen the burden on
providing control groups for each new therapy, I proposed that we set aside
in some underdeveloped hospital a standard control group which would provide
the natural history baseline for the disorder, and that various investigators
of new methods would choose as their subjects individuals matched with the
standard control group and in that way provide a baseline of non-specific
treatment outcome. Today, such a scheme is hardly possible, but it might be
useful to stress during training the need for collaborative efforts where
one control group might serve the purposes of several research undertakings.

Another problem in design arises from the need for using statistical
controls such as covariance techniques in controlling irrelevant variables.
There are several difficulties involved in using such statistical controls
which could be eliminated if a sufficient number of subgroups differing in
the covariate could be found. By plotting the value of the means on the
relevant variable against the covariate, the line of trend could be established
and a determination made whether the mean of the schizophrenics is outside
this line of trend.
To summarize the foregoing discussion, I have drawn up a tentative schema for the following training needs:

1. Some common assumptions regarding schizophrenia which can serve whatever etiological model is adhered to;

2. Proposed training tracks for the purpose of providing as much interdisciplinary exposure as possible for a candidate whose primary field has already been selected;

3. Certain tactics for engaging in research which, because of the current financial crunch, are likely to be most efficient and have higher probabilities for success.

This proposal is far from complete and my categorical preferences are not as convincing even to me as they might be. I am putting them forward as a means of providing a scaffold for building a better plan.

Some Final Considerations

It is quite clear that regardless of the primary field of the candidate, he would need considerable exposure to a schizophrenic population in order to get acquainted with the nature of the problem, its phenomenology and its course. Without such exposure, many of the theoretical questions lose their significance and many of the practical problems in dealing with patients are overlooked.

The structure of the research teams in which a trainee would receive his research experience may also be an important matter to consider. Such research teams can also be classified as either (1) mixtures of members working side by side, each a specialist in non-overlapping fields, (2) amalgams in which the several independent members of the team have at least
one common denominator, e.g., biometrics; (3) alloys in which two or three or more independent disciplines are fused together so that each discipline is interwoven with the others, with considerable overlap in knowledge and skill; or (4) compounds in which each scientist is fully trained in the disciplines necessary for solving the problem and cooperating fully in the arriving at a decision regarding solution. This would necessitate the establishment of the disciplines required as the minimal essentials in the training of research schizophreniologists.

In view of the current needs of the field of schizophrenia, it might be well to take an inventory of the amount of activity in the various models so as to determine which are underdeveloped and which perhaps are overdeveloped. We begin with the assumption that because of our abysmal ignorance, there is no choice but to nurture them all, and since we can not predict where the lightning will strike next, none can be discounted. We might, however, inquire as to which has produced more innovation and progress with regard to the three major areas of treatment, etiology, and prevention. It is clear that with regard to treatment, the most productive models at the moment are the internal environment (psychopharmacology) and learning (behavior modification), the latter perhaps not as fully developed as the former. With regard to etiology, the developmental model (family research) and the hereditary model (twins, adoptees etc.) are in the forefront. With regard to prevention, perhaps the ecological model, with its strong thrust in the direction of individual occupying niches that constitute high risk for mental health, is in the lead. At the moment there seems to be a dearth of training in this model, especially in its epidemiological and public health aspects.
There is one approach, the descriptive, which seems to run through all the models and is yielding interesting results in all of them. We may have reached the saturation point in the development of interviewing techniques and rating scales, and the proliferation of so many research groups in this area may have to be reduced and the field limited to the few centers that have proved their ability to make further progress. (\textit{\textsuperscript{\textcopyright}2020})

However, one aspect of the descriptive approach is well worth further development. I am referring to the investigations of the pattern of physiological, sensory, perceptual, psychomotor and conceptual response which differentiates patients from normals and also serves to fractionate a given group of patients into more homogeneous subgroups. By providing techniques which are relatively culture free such as the techniques for bimodality reaction time, energy integration and evoked potentials (Sutton, S., 1971\textsuperscript{a}), we can use the iterative method to make more and more homogeneous subgroups within our patient population. Such homogeneous subgroups can provide better testing crucibles for pertinent etiological hypotheses.
The research dealing with motivation, locus of control, and self-actualization, which may perhaps belong under the developmental model, is a burgeoning one and needs more direction and funding. The gestation problems, especially the nutritional and the entire prenatal area, is looming large as a possible etiological source and needs considerable attention. In the ecological sphere, work directed at network analysis (Muriel Hammer) and at determining the parameters of the ecological niche (Barker) seem to be very promising and need further support.

Another important area is the personality sphere, i.e., the systematic behaviors of the schizophrenic which are more or less independent of his psychopathology. If we accept the notion that the schizophrenic is essentially a vulnerable individual who can be catapulted into a psychosis by internal (endogenous) or external (exogenous) stressors, it becomes necessary to study and assess the personality of the patient with regard to his premorbid characteristics. I have elsewhere (Zubin, 1965) discussed the possible relations between personality and psychopathology and would like to propose that a sound position with regard to this relationship is the null hypothesis, which stipulates that personality is essentially independent of psychopathology in the premorbid phase. During the morbid phase, personality colors the psychopathology by an exacerbation of personality traits. Finally, in
the post morbid period, personality is again independent of personality, except in those cases where the episode left residues, either as a direct result of the disorder or as incidental sequelae such as hospitalism or the social breakdown syndrome (Gruenberg). We need to know both the assets as well as the liabilities of the patient's premorbid personality in order to deal with him adequately. Another reason why we need personality studies is the emerging finding that relatives of schizophrenics seem to possess characteristics which cover a wide spectrum of personality, and in order to get a satisfactory classification, we need to train more people in the area of personality assessment.

In summary, I would suggest the following priorities from the point of view of both current tactics as well as overall strategy in the training of schizophreniologists:

1. Developmental Model
   Such areas as the paranatal, early experience, and family interrelationships and investigations of premorbid personality.
   Studies of locus of control, motivation and self-actualization in normals and in schizophrenics.

2. Descriptive approaches
   Culture-free indicators for the classification of subgroups of schizophrenia.

3. Learning models
   Studies of the conditions under which objectively defined psychopathological behaviors are acquired, maintained, and altered as a function of stimulus-response relationships.
4. Ecological model

Network of relationships between individuals (Hammer) and taxonomy of the parameters of the ecological niches occupied by the patients.

As a last comment it might be well to point out that the word "training" is ill chosen for the education of the research schizophreniologist of the future. Training usually refers to a well developed system of instruction which contains specific techniques and methods which can be transmitted directly to disciples or trainees. By the very nature of schizophrenia, we have to prepare our future scientist for uncertainty -- since the most certain thing we know is that the picture of schizophrenia will surely change and our knowledge of it will be drastically altered. How can you prepare a scientist for such uncertainty? The only solution is to expose him to the currents of change that are now going on and hopefully expect him to keep up with this ever-changing field by continued study of all its aspects. Like Alice, we have to run fast just to keep up with what is going on and yet have enough energy left over to do our own thing!
Selection of trainees

Perhaps the greatest hurdle for developing good researchers is the problem of selection. The first question to answer is at what level should selection take place -- at the undergraduate, graduate or post graduate level? I choose the last alternative since it is very difficult to determine at the earlier levels where the student's interests lie and whether he would be suitable for a research career. However, at that advanced level, screening has already taken its toll of the less able (and hopefully not too many of the unusually able). There are no tests, no interviews, no techniques now available for determining suitability for high level creative work. Perhaps one way of dealing with the problem might be based on our experience with the selection of candidates for training in psychoanalysis at the Psychoanalytic Clinic for Training and Research at Columbia University. I had served on the selection board of this Clinic for about two decades and had administered a large battery of psychological tests and interviews to all incoming candidates, including the Miller's Analogie Test, Projective Techniques, Cultural Tests, Vocational Guidance Tests, Value Tests, etc. At the end of the two decades, I analyzed the tests in relation to success as estimated by the staff. None of the tests and interviews distinguished between the more and less successful. However, after some persuasion, I prevailed upon the faculty to take one of the tests -- the Strong Interest Blank -- and utilizing the faculty's profile of interests, scored each candidate for his degree of agreement with the faculty's profile. As you might guess, those who resembled the faculty came through with flying colors, while those who were distant from the faculty had great difficulty. Perhaps each Research Unit to which a candidate applies might provide a profile for its research staff and the candidate can then choose the group with whom he is most gemütlich or compatible (Burdock, E. I., et. al., 1960).
References


