Research Traditions Available to Family Medicine

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Family medicine has declared its territory to include the *psychological* and *physical health* of the *patient* in the context of his or her *family* and *community*.[1] The italicized words suggest that the disciplines basic to family medicine must range far beyond the biological sciences usually taught in medical schools. These disciplines certainly include psychology, sociology, anthropology, and epidemiology in addition to the biological sciences. Arguments can also be made to include economics, organizational development, education, and other disciplines.

In developing a research thrust, family medicine researchers will need to collaborate with seasoned researchers of other disciplines. They are likely to influence the directions of family medicine research, and family practice researchers should be alert to these influences. Just as a family physician consulting with a surgeon or an internist on one of his/her patients needs to be aware of the orientation and preferred methods of these specialists, the family medicine researcher consulting with an epidemiologist, a psychologist, or an endocrinologist in the study of juvenile diabetes in his practice needs to be aware of the orientation and preferred methods of these consultants. Without such awareness, the family medicine researcher is likely to be confused by inconsistencies in advice and differences in methods among consultants. The purpose of this paper is to present in broad strokes some of the major differences in orientation and methods of research which exist among family medicine's basic disciplines. The paper concludes with some suggestions for family medicine researchers who intend to work closely with researchers from these disciplines.

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Four Major Research Traditions Influencing Family Medicine Research

Fortunately, the scientific community is in agreement on many of its basic tenets. Taken in the broadest sense there is a scientific method. Further, common sense groupings, such as the biological sciences, have a great deal in common with each other. For purposes of this paper, the biological sciences share enough in orientation and method to be considered as belonging to a single research tradition. There is no question that the practice of family medicine has been profoundly influenced by developments within anatomy, biochemistry, physiology, and other biological sciences, and will continue to be profoundly influenced by them in the future. A second tradition of research likely to influence family medicine I will call the agricultural tradition. Experimental methods and statistical analysis techniques developed for the scientific study of agriculture have permeated psychology, sociology, economics, and many areas of public health and clinical medicine. A third major tradition, the epidemiologic tradition, is expected to play a major role in many concerns of vital interest to the family physician, including prevention and control of chronic illness, community medicine, and development of a rational system of health care delivery. Finally, the ethnographic tradition, most closely associated with community sociologists and anthropologists, offers concepts and methods for the study of dynamic human relationships in communities, families, and other groups.

Traditions, like languages, are invaluable human inventions for distilling the experience of the past and making it available to those who follow. This is as true in the specialized subcultures of scientists as in general culture. Scientists continually invent, test, and promulgate new concepts and findings for critical review by their colleagues. These are usually assimilated into the scientific fabric only as they can be made to fit the preexisting framework of the science. In this way, normal science[2] evolves from its historical roots. Methods of study and analysis employed within various scientific traditions are also the result of historical development. The methods of each tradition are grounded in basic assumptions about both the phenomena worthy of study and the ways in which they can best be understood.[3]

A brief summary of the aims, interests, methods, and assumptions of each of the four traditions is presented in the following sections. Such a brief sketch is hazardous since oversimplification and even stereotyping are inevitable. It should be recognized that a history of any discipline would reveal vigorous intradisciplinary competition among ideas and approaches, with various camps gaining and losing influence as the discipline develops. The sketches of each research tradition presented here should be regarded as a general orienting framework to aid the family medicine researcher in his search for appropriate research methods and colleagues.

Research in the Biological Science Tradition

The tradition of the biological sciences is familiar to all individuals trained in medicine and is understood in at least a rudimentary way by the lay public. The dominant aims of the modern biological science tradition are to establish natural laws and to describe mechanisms underlying biological phenomena.[4] The methods of anatomists, physiologists, and biochemists certainly differ from each other in obvious ways. But, a widely shared assumption of these biological researchers is that one gains knowledge by studying in great detail the smallest and simplest system which has the characteristics of interest. One of the reasons for the phenomenal success of the biological sciences in the 20th century is that technology has enabled biologists to observe and measure smaller and smaller phenomena with greater and greater precision. An important benefit in observing small simple systems is that they contain less of the variability which complicates the study of complex biological and behavioral systems. Study of small simple systems is justified by the expectation that complex phenomena, such as disease, ultimately can be explained as concatenations of simpler, highly predictable mechanisms. Thus, the total understanding of a disease is expected to come from reducing the disease to its component biolog-

ical mechanisms and their relationships.

This kind of approach to understanding, called *reductionism,* can be contrasted to the older biological science tradition of the naturalist. For the naturalist, the data of interest include descriptions of the complex relationships and the dynamic adaptations of organisms to their environment. John Platt[5] relates an incident at a 1958 conference on biophysics which illustrates the different viewpoints. During the meeting a distinguished cell biologist declared, "No two cells give the same properties. Biology is the science of heterogeneous systems." He added privately, "You know there are *scientists*; and there are people in science who are just working with these oversimplified model systems—DNA chains and in vitro systems—who are not doing science at all. We need their auxilliary work: they build apparatus, they make minor studies, but they are not scientists." Biophysicist Cyrus Levinthal replied, "Well, there are two kinds of biologists—those who are looking to see if there is one thing that can be understood, and those who keep saying it is very complicated and that nothing can be understood. . .you must study the *simplest* system you think has the properties you are interested in."

There are certainly biological scientists who could carry on this argument today, but the recent triumphs of the biological scientists have favored the reductionists. The best research of this tradition seeks to distinguish between alternate models of reality (Is the DNA molecule a double or triple helix?) or alternative explanations of some phenomenon (Are maggots spontaneously generated from bad meat or do they enter the meat from an external source?) and conducts experiments which are likely to demonstrate unequivocal results. This orientation calls for research methods based on hypothetico-deductive logic, in which an explicit statement of the hypothesis is followed by a definitive experimental test under highly controlled laboratory conditions. For many people, this approach is synonymous with the term 'research'. It is an elegant and powerful model of research well suited to the currently important questions of basic biological research. But, when it has been extended beyond the biological and other natural sciences, it has usually met with less spectacular success.

A clinical philosophy of "biological reductionism" usually carries negative connotations within family medicine. The term is usually applied to physicians who view problems such as obesity or anxiety in terms of metabolic or physiochemical imbalance. Management by such clinicians is heavily oriented toward laboratory diagnosis and drug therapy, while ignoring the ecology and psychological life of the patient.

The astounding successes of the biological sciences over the past century have left a legacy of assumptions in clinical medicine often referred to as the biomedical model. As Kerr White has observed, "Most tertiary care, including most medical education, is based on a deterministic, even reductionistic, view of health and disease. . . .The primary care physician has more in common with the naturalist than with the physicist. . .[and it is] time to expand our fundamental knowledge about the natural history of disease to the same extent that we have expanded our knowledge of cell biology."[6]

The difficulty which family medicine has experienced in making its clinical approach understood within the medical community provides a dramatic example of how a particular tradition of basic research can shape the general perception of clinical reality in fundamental ways.

Research in the Agricultural Tradition

Much of clinical medicine, even today, is based on empirical observations and lacks full understanding of basic mechanisms. Clinicians must be content with "likely" causes and "probable" outcomes. Agriculture, like clinical medicine, involves the nurturing of complex organisms in an environment exposed to countless unpredictable influences. These influences, in both medicine and agriculture, obscure the relationships between cause and effect which often can be brilliantly demonstrated in simpler systems.

Major advances in agricultural science began in the 1920s. At that time, Sir Ronald Fisher laid the theoretical foundations of modern statistical inference and hypothesis testing methods.[7] These powerful models offered the means to bring under ex-

perimental control the troublesome fluctuations which obscured lawful biological relationships. These statistical models led to sophisticated methods of experimentation and data analysis, which found their way rapidly into psychology, sociology, education, and economics as well as into clinical and biological research involving manipulation of complex systems.

Experimental methods dictated by Fisher's statistical models include random selection of experimental units from a defined population and random allocation of these units to different experimental conditions. The method of analysis which has come to exemplify this tradition is the linear regression model, which seeks to quantify for any defined outcome (or dependent variable) the relative contributions of several potential influences (or independent variables). To use an agricultural example, one might define the outcome of interest to be yield of grain per acre. One might hypothesize that yield is influenced by such variables as latitude, mean temperature, soil moisture, hours of sunshine, and nitrogen content of fertilizer. In a single experiment, some of the variables might be held constant, others carefully monitored, and others experimentally manipulated. Regression analysis applied to the data of this controlled experiment would enable one to calculate the unique contribution of each independent variable (main effects), any effects due to nonadditive combinations of independent variables (interaction effects), and effects due to either unspecified variables or random variation (error).

More complicated study designs and analyses developed. Simple outcomes such as yield were replaced by multivariate outcomes such as "quality of yield"—an abstract construct which might be composed of bushels per acre, rate of growth, resistance to disease, nutritive value, taste, and appearance.

This general methodology was readily transferred into the behavioral and social sciences where measurement of yield was replaced by measurement of constructs such as "adjustments to social norm," "educational achievement," or "economic health of the community." Any number of potential influences can be hypothesized as affecting each of these outcomes and thereafter measured and manipulated to isolate the components of behaviorally or socially important outcomes.

The rapid development of this research tradition within the social and behavioral sciences was fostered initially by the desire of these disciplines to acquire some of the respectability of the natural sciences.[8] The powerful statistical models permitted social and behavioral science researchers to carry out more rigorous experimental and quasi-experimental research. The trend was given an enormous boost by the development of the digital computer, which made practical the manipulation of statistical data formerly too time consuming to compute.

The parallels between the agricultural tradition and the biological science tradition are striking. The methods of the agricultural tradition seek to make causal inferences about the laws which govern or influence biological, behavioral, and social phenomena. Fisher's hypothesis testing statistics are clearly in the hypothetico-deductive logic of the biological sciences. The methods are reductionistic in philosophy in that the linear regression equation has been used primarily to partition an outcome into a set of prior influences which additively account for the outcome. The high value placed on causal inferences has tended to reward well-controlled, short-term, experimental studies performed under near-laboratory conditions. Concerns related to scaling and precise measurement of psychological characteristics have preoccupied the behavioral sciences for decades.

The past decade has seen a marked decline in the extreme reductionist position in the behavioral sciences, marked by the waning of the stimulus-response paradigm in psychology and with it the rat laboratories and the three-letter nonsense syllable, once the basic unit of study in the psychology of memory and language.[3]

The investigations of clinical medicine have been slower to embrace the agricultural model in all of its sophistication. Only occasionally has the linear regression equation appeared in the major clinical journals in any of its common forms, such as analysis of variance, multiple regression, or discriminant function analysis. Instead, the rudimentary chi-square test and an occasional t-test account for the great majority of inferential statistical tests found in these pages. Only within the past 30 years have randomized clinical trials become generally accepted methods in clinical investigations.[9]

Nevertheless, the agricultural tradition of research is currently enjoying high status in clinical medicine. This is appropriate since it offers important concepts and techniques, especially in isolating the multiple effects of various clinical interventions. An unfortunate side effect of this tradition's current popularity is the intimidating influence of sophisticated statistics. The statistically naive researcher may be either unnecessarily discouraged by his ignorance or may concern himself more with statistical etiquette than with logical inferences. A particularly obvious example of the latter is seen in the common overemphasis on statistical significance and the underemphasis on clinical relevance in the rationale supporting clinical research conclusions.[10]

Clearly, the appropriate use of the agricultural tradition is growing in medicine. Federal funding of programmatic basic and applied research through regional centers, such as centers for diabetes, cancer, and aging, have required an approach which emphasizes probabilities and multivariate effects of clinical and social interventions as well as deterministic biological mechanisms of action. In family medicine, the interest in behavioral and social aspects of illness and the close association with professionals trained in these disciplines has already begun to influence family medicine research. Studies of patient compliance, patient education, efficacy of alternative treatments, and objective evaluation of training programs are often organized around the assumptions and methods of this tradition.

Research in the Epidemiologic Tradition

The modern epidemiologic tradition emerged during the first half of the 19th century. Nurtured by a relatively small group of individuals who have made important contributions to the understanding and control of disease, epidemiology has always been something of a stepchild of medical research, developing in the shadow of the biological sciences.[4] Even today, many university departments of epidemiology have only tangential relationships with medical schools.

Epidemiology may be defined as the study of the distribution and determinants of diseases and injuries in human populations.[11] The early focus of epidemiology was on infectious disease with the aim of gathering clues related to epidemics of infectious disease that ravaged the European continent and the British Isles. Epidemiologic methods developed to the point where the spread of infectious disease could be followed over time through the geography of an area, leaving clues which suggested the type of infection, existence of alternate hosts, virulence, and the effectiveness of various kinds of interventions such as quarantines, change in waste disposal methods, or inoculation.[4]

Following World War II, epidemiologists began taking greater interest in chronic, noninfectious diseases, especially heart disease, cancer, and diabetes. The greater complexity involved in the study of these diseases required collaboration between epidemiologists, biostatisticians, and other disciplines resulting in an extension of basic epidemiologic methods to meet the new research demands.

Most recently, Kerr White[6] has forecast a renaissance in clinical research based on the "new epidemiology" involving ambulatory patients, "and even 'non-patients' at the earliest stages. . .in the natural history of illness." Just as the investigation of chronic disease stretched the methods of epidemiologists, White foresees further extension of epidemiologic methods to respond to the long-neglected frontier of ambulatory health care. New classification systems of ambulatory illnesses and health-related behavior, more clearly defined terms to describe ambulatory care from the point of view of both providers and consumers, and the development of new techniques of data analysis are developments within the epidemiologic tradition that are already underway. The new epidemiology will focus on situational, personal, and environmental factors associated with the onset of illness; it will seek new ways of predicting the onset of illness; and will assess the contribution of many diagnostic and therapeutic routines whose value in the ambulatory setting has merely been assumed.

Thus, problems of interest to this tradition have moved from causes of death to progressively earlier and less clearly defined stages of illness. The

continuation of this trend is virtually certain, given current national interest in a rational health care system. Epidemiology has been recognized as a fundamental science which will play a major role in US health care service planning, administration, and evaluation at all levels of an emerging health care system.[12] Family medicine can hardly escape the influence of this tradition on its future.

Most epidemiologists were initially trained as clinical physicians. For this reason, it is not surprising that epidemiology has always had a strong interest in applied science. A consistent goal of this tradition has been to improve health by stepping back from the individual victim of disease and looking at the pattern of disease in the community. This perspective has often been fruitful. In John Snow's classic investigation of the 1854 London epidemic,[13] cholera was recognized as a disease of contaminated water and brought under control almost half a century before its causative agent was isolated in the laboratory.[11] Epidemiology also deserves credit for demonstrating multiple causes of virtually all diseases, including host susceptibility and environmental factors in addition to exposure to pathologic agents. Epidemiology thus helped counterbalance the overly deterministic "unique cause" mentality that emerged with the revolution in bacteriology.[4]

There is an interesting contrast between the motivations of the biological sciences and of epidemiology. The central aim of the biological sciences is to unravel the puzzles of nature. Improvement of health is an important byproduct. In epidemiology, improvement of health is central and clues as to etiology are important secondary benefits.

As with each of the traditions described, the methods of epidemiology are strongly influenced by its fundamental concerns. For epidemiology these concerns have related to the control and prevention of disease in human populations. I would like to highlight three aspects of epidemiologic methods which follow from its particular research interests, and contrast them with methods characteristic of the biologic science and agricultural traditions. First, and perhaps most important, the emphasis on naturally occurring disease in human populations leads to a strong orientation toward naturalistic field studies rather than toward experimental approaches. Experimental intervention studies, such as the Veterans Administration Cooperative Study Group on Anti-Hypertensive Agents[14,15] and the University Group Diabetes Program Study of hypoglycemic agent efficacy,[16] are also employed. But, even in these studies, few variables are directly under the control of the experimenter, and many more are simply monitored as they would be in a nonexperimental study.

Secondly, the naturalistic observations of the epidemiologist do not lend themselves well to a hypothetico-deductive logic. Instead, the logic of this tradition is more inductive in flavor. Epidemiologists sometimes describe themselves as disease detectives, searching for clues which can be woven into a web of evidence—a well-integrated structure which is internally consistent and compatible with existing knowledge. The Surgeon General's Report on Smoking and Health[17] provides an excellent example. Tobacco companies pointed out for years that there was no "proof" that smoking caused cancer (meaning that a hypothetico-deductive mode of causal inference based on human experimentation was not employed), although the patterns of evidence from scores of studies ruled out every other plausible explanation.

The third contrast relates to the handling of numerical data. The biological sciences are more likely to search for deterministic mechanisms of action which rely on precisely predictable measurements rather than probability estimates. Both the agricultural and epidemiologic traditions depend heavily on probability theory and statistical methods, but there are important differences in the *kinds* of statistical methods used by these two traditions.

Whereas research in the agricultural tradition more often defines *variables,* creates *scales,* and measures the quantities of the variable present under different (often experimental) conditions, epidemiologists are more inclined to *classify* phenomena such as cases of disease or morbid events, and to *count* discrete events which fall into its classification scheme. The measurements characteristic of the agricultural tradition are usually summarized as *means* (which relate to a theoretical sampling distribution, called the normal distribution) and as *variances* (which relate to a theoretical sampling distribution, called a chi-square distribution—not to be confused with the chi-square test statistic.

In contrast, the *counts* of the epidemiologic tradition are usually summarized as *rates* (which relate to the theoretical binomial distribution and its extension, the Poisson distribution.*) Modern epidemiologists employ many classification schemes and their methods of counting and comparison have developed rapidly over the past quarter century. The influence of computer technology and growing collaboration with biostatistics have blurred many of the distinctions between epidemiologic and agriculturally based statistics which were clearly discernable 30 years ago.

Research in the Ethnographic Tradition

Ethnographic methods are historically associated with cultural anthropologists, particularly in the study of foreign, nonliterate societies. Central to this approach is the use of disciplined but subjective observations of the researcher, who comes into extended and intimate contact with the group being studied. Ethnographic methods have been adapted and applied to the study of many not-so-foreign "societies" including elementary school children,[18] prostitutes,[19] medical students,[20] and at least one family medicine residency program,* to name a few. Each of these studies is characterized by participant observation involving rich description, indepth interviews, and a search for shared assumptions and meanings which provide unifying explanations for the dynamics of events and behavior in the setting.

The rationale underlying the ethnographic approach has been described by Wilson.[21] This rationale is based on two assumptions which contrast strongly with those of the other traditions described. They especially challenge the basic concepts of behavioral and social scientists trained in the agricultural tradition of research. The two assumptions are entitled the naturalistic-ecological hypothesis and the qualitative-phenomenological hypothesis.

The naturalistic-ecological hypothesis holds that human behavior is significantly influenced by the physical setting in which it takes place and by the internalized notions of individuals about the kind of behavior that is expected and allowed. It follows that understanding of these powerful influences is an essential part of any truly scientific attempt to account for human behavior. A crucial implication is that research which alters the ecology or creates new expectations results in behavior that is not typical. This leads to the conclusion that unobtrusive observation of individuals in their natural setting is essential to the understanding of typical behavior.

The second assumption, the qualitative-phenomenological hypothesis, has even more far reaching implications. This hypothesis rejects the concept of scientific objectivity as inappropriate when applied to the study of man. Instead, it draws from phenomenology, a social science tradition much more prominent in Europe than in the United States, the assertion that the social scientist "cannot understand human behavior without understanding the framework within which the subjects interpret their thoughts, feelings, and activities."[21]

The phenomenologically oriented researcher would argue that *a priori* statements of explicit hypotheses and the collecting of predetermined sets of data require the "objective" researcher to make arbitrary decisions about which variables are important and how they should be interpreted. Overholt and Stallings[22] contrast the experimental hypothesis with the ethnographic hypothesis in this way:

> . . .the anthropologist scraps or modifies any hypothesis which does not fit ethnographic facts. It is not the tendency to manipulate social phenomena in an attempt to support or refute a hypothesis; rather, the anthropologist manipulates hypotheses in order to arrive at statements that account for as many of the observed facts as

*It should be noted that each of these theoretical distributions is mathematically related to the others.

*Hollenbach M: The family medical center: A field-work report, unpublished

> possible with the greatest degree of economy, simplicity, and elegance possible. . .an *experimental researcher* will not necessarily discard or modify his hypothesis if he fails to confirm it. Indeed, such an investigator may even resort to manipulating the conditions or design of an experiment while holding the hypothesis constant.

Lutz and Ramsey[23] claim that hypothesis generation rather than hypothesis testing is the special province of anthropology. While this may be an overstatement, it is true that researchers employing ethnographic methods are required continually to conceive, revise, and discard hypotheses throughout the course of a research project. The hypotheses retained and developed will be those which have the most explanatory power and may or may not conform to previous theory.

The reason for all this apparent "softness" of method is that social events and behavior, unlike the phenomena of the physical world, may take on fundamentally different significance depending on the social meanings attributed to them. The ethnographically trained researcher, for example, might argue that it makes little sense to compare strategies for gaining patient compliance with therapy without gaining some idea of how patients interpret the meaning of each strategy. The same strategy may be interpreted by some patients as caring, by others as condescending, and by still others as pointless.

The richly descriptive prose characteristic of ethnographic studies does not exclude the use of quantitative analysis. In fact, ethnographers have recently felt considerable pressure to make greater use of available quantitative techniques. Much of this pressure comes from funding agencies which are reluctant to fund "soft" research. In a recent dispute, the chief of the Anthropology Section of the National Science Foundation lectured at 60 universities, addressing anthropologists on ways to make their grant applications more "scientific and competitive" for funds.[24] She provoked the ire of numerous anthropologists who berated her for trying to stuff the questions of cultural meaning into methodological canons of the natural sciences.[25,26] Modern ethnographers do seek support for their hypotheses in quantitative data, usually from archival records, but more and more through quantitative analysis of their own primary data.

There is also growing appreciation for the ethnographic tradition within the statistically oriented behavioral and social sciences. Donald Campbell, a highly respected methodologist of this tradition, once said of the "one-shot case study," "Such studies have such a total absence of control as to be of almost no scientific value."[27] Later, he qualified his "earlier dogmatic disparagement of case studies" with the following statement:[28]

> After all, man is, in his ordinary way, a very competent knower, and qualitative common sense knowing is not replaced by quantitative knowing. Rather, quantitative knowing has to trust and build on the qualitative, including ordinary perception. We methodologists must achieve an applied epistomology which integrates both.

Most family physicians believe that patient health and illness are profoundly influenced by the relationships of home, family, job, and community and by the meanings attributed to behavior, events, and artifacts within these relationships. The concepts and methods of the ethnographic tradition are ideally suited to family medicine research in these areas. Research which immediately comes to mind in this vein includes studies of family dynamics, relationships between job stress and illness, health-team functioning, physician-patient relationships, quality of life in nursing homes, and cross-cultural marriages.

Implications of Eclectic Borrowing from Many Traditions

Researchers have personal styles, training, and experiences which lead them to feel at home with some methods and less comfortable with others. Experimental researchers often disdain the "softness" of naturalistic observations and explanations, while field observers frequently wonder at the motivation of experimenters who puzzle over minuscule systems which only occasionally attract interest beyond a small circle of colleagues.

The isolation of one tradition from another is revealed in unique lexicons of research methods

and concepts. With few exceptions, only epidemiologists speak of retrospective or prospective studies; only ethnographers concern themselves with the distinction between emic and etic perspectives in data gathering; and only the agricultural tradition seems to bother with issues of homoscedasticity and interval scaling. Mention a "cohort" to a psychologist and he may assume you are referring to a colleague. At least one popular text of epidemiology gives an explanation of the phrase "interaction of variables" which would amuse any first-year graduate student in the agricultural tradition. "Confounding" is a vital concept to both the epidemiologic and agricultural traditions of research, since it is confounding of variables which limits our ability to make causal inferences. Yet, the two traditions seem to define the term differently. Only occasionally will one researcher be able to understand, design, or carry out a research protocol of another tradition with professional quality.

Given this highly discontinuous spectrum of possibilities, what should be the approach of the family physician who wishes to investigate a particular clinical problem? Suppose, for example, he or she wishes to contribute new understanding to the problem of diabetes in adolescents. This vaguely defined concern could be of interest to researchers from all four traditions. Each researcher would be likely to cast the concern into a researchable problem of a type familiar to his tradition. Each could also offer examples of related research already completed and awaiting the family physician's contribution.

With all of the choices available, our researcher might be overwhelmed with research options and decide to retreat. But, if he or she is prepared to listen to multiple perspectives and conflicting advice, such talks may help to locate the aspects of the problem, as conceived by others, which come closest to the family physician's actual interest. In the process, he will learn something about the approach of each tradition. Since the questions of interest to family medicine will continue to cut across many disciplines, family medicine researchers may even find new ways to integrate the concepts and methods of several traditions. Exempted from the restrictions imposed by customary methods within a basic discipline, family medicine research could benefit from a kind of methodological hybrid vigor.

Eclecticism in research carries obvious risks, however. As mentioned earlier, there is the risk of simple discouragement that comes with the realization of great complexity. Another risk is that by moving rapidly from one tradition to another, the family medicine researcher may fail to grasp important details. Superficiality, misapprehension of issues, misapplication of methods, and overdependence on research consultants are possible. These potential problems could hamper the development of family medicine's knowledge base. I would offer four suggestions for dealing with the opportunities and risks inherent in borrowing from other traditions.

First, I do not believe it advisable or possible for family medicine to develop a knowledge base in isolation from its basic disciplines. Methods for the exploration and investigation of most of family medicine's researchable questions already exist in and are available through collaboration with these disciplines. It would be impossible for family medicine to develop such resources by itself within any reasonable period of time.

Secondly, understanding that all experienced researchers neither think alike nor possess the same skills is essential. Sensitivity to the broad traditions of research can aid in orienting the newcomer to the tasks of defining research options, selecting research colleagues, and interpreting multiple research perspectives.

Thirdly, family physicians can protect their research interests only by remaining vigorously question oriented rather than method oriented. A cautious awareness that consultants may reframe questions in ways which better fit their methods, but which skirt the interests of family medicine, should help to prevent such deflections.

Fourthly, family physicians can develop close ties with colleagues and consultants of other disciplines whose conceptualizations of research problems are compatible with their own. Through close collaboration, researchers of other disciplines can gain a full understanding of family medicine's concerns and more effectively harness their own expertise.

A major question remains. Can family medicine develop a meaningful research thrust when its researchers are so widely dispersed among the available sets of assumptions, theoretical orientations, and research methods? I believe the answer to this question is a qualified yes. A coherent re-

search thrust is a great advantage for progress within a theoretically oriented, basic research discipline. Concentration of resources for investigating theoretical questions within an assumed framework seems to lead to more rapid development of ideas. Therefore, *theoretical* developments in family medicine can be expected to receive only spotty acceptance within the specialty until a coherent framework emerges. But, at this point in time, there is little consensus about whether family medicine or any medical specialty can even qualify as a discipline. Most research in family medicine will be applied rather than basic, with an emphasis on improving practical decisions of patient care and health care delivery. Such a real-world orientation can profit greatly from eclectic borrowing of well-established concepts and methods of related disciplines.

In any case, coherence of ideas and methods cannot be mandated. Every academic discipline and medical specialty has evolved and continues to evolve through both external influence and the accomplishments of its members. Family medicine will also evolve as its individual practitioners and scholars define their concerns and reach out to resolve them.

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