

The Validation of the Biopsychosocial Model

Howard Brody, MD, PhD
East Lansing, Michigan

The review of angina by Medalie¹ claims to "validate" the biopsychosocial model developed by Engel² and widely adopted by family medicine educators and investigators. Presumably this validation occurs because the literature review demonstrates that psychological and social factors can play as important a role in the development and evolution of angina as biologic factors.

It is worth asking precisely what it means to "validate" a model such as the biopsychosocial model. Discussing that point may help to clarify some aspects of the model itself. It may well be the case that the key question is not whether the model could be validated, but whether it could be invalidated.

Medalie¹ distinguishes at one point between the biopsychosocial model and a systems model. The biopsychosocial model, however, seems to have its roots in systems theory as well as in cybernetics.³ It posits many levels of organization, ranging from the molecular to the social and ecological levels, related to each other in whole-part fashion, and generating interlevel information flow through a variety of feedback loops. These levels and feedback loops could possibly be viewed in mechanistic cause-and-effect terms; but the biopsychosocial model seems to fit better with a probabilistic rather than a mechanistic model of reality, such as is favored by modern physics.^{4,5}

How well has the model been validated? Has Medalie simply picked one disease that happens to fit the model, while ignoring dozens that do not? A very crude but still illustrative way of answering this question is to date the model as having arrived on the scene in 1977 with Engel's now classic paper² and then to see what new disease problems have arisen since then and how closely the resolution of the problems has depended on the biopsychosocial approach.

There seem to have been three widely publicized, newly recognized disease entities that have struck since

around the time of Engel's paper, and all three have yielded a great deal to biomedical research. Two—legionnaires' disease and toxic shock syndrome—have been approached in a solely biomedical, mechanistic mode with great success. Biological causes were found and biological treatments devised with little or no reference to psychological or social determinants. The third, acquired immune deficiency syndrome (AIDS), now has, thanks to intensive biomedical research, a known cause, known routes of transmission, and a known treatment of partial efficacy. There has been, however, a much greater recognition of the need to appreciate the social and cultural factors that primarily determine the spread of human immunodeficiency virus. While there remain doubting Thomases (of the Lewis variety) who think that ultimately a vaccine will solve everything, the more general consensus is that psychological and social change is an absolute prerequisite to halting the spread of the disease.

The point here is, granted that AIDS might be comparable to angina as a sort of validation of the biopsychosocial model, could it then be said that legionnaires' disease and toxic shock *invalidate* the model? The model does not *deny* that bacteria cause disease or that antibiotics kill bacteria. Cellular and molecular levels of organization and feedback are as much a part of the model as are cultural and social levels.

According to the biopsychosocial model, factors that potentially influence any health outcome exist at many levels of organization, and scientific scrutiny is required at all those levels to detect which factors indeed play a significant role. In some cases, so many factors will all play equally important roles that only broadly based biological, psychological, and social interventions will be efficacious in altering the outcome. In other cases, however, scientific scrutiny will reveal that one or a few factors, at one or a few levels, dominate; and the alteration of those few factors is sufficient to produce the desired result.

Campbell's extensive review,⁶ which Medalie cites, is bound to be a disappointment to dedicated family medicine advocates. The review demonstrates that a very large number of illness states have been shown to be influenced by family factors, but only a small handful of studies have

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From the Department of Family Practice, Michigan State University, East Lansing, Michigan. Requests for reprints should be addressed to Howard Brody, MD, PhD, Department of Family Practice, Michigan State University, B100 Clinical Center, East Lansing, MI 48824.

demonstrated that family-level intervention is specifically efficacious in improving health outcomes. Still, however disappointing this observation is for those of us who enjoy studying and teaching family dynamics, it hardly invalidates the biopsychosocial model. It should be no surprise under the model that family intervention is efficacious in only a small class of health problems, even though family factors potentially influence a wide variety of health problems, any more than it is surprising that some sorts of family dysfunction respond well to family therapy, others to more broadly based social changes, and still others to the administration of medication to one or more family members.

Exactly what would invalidate the biopsychosocial model? The model has recently had its critics. Ruane⁷ faults it for leaving out a critical ingredient of the healing system, the physician—as if the physician were the isolated observer, posited by the mechanistic model, whose observations do not alter the system in any fundamental way. Foss and Rothenberg⁸ argue that the model concedes too much to the traditional biomedical approach, and that modern medicine needs an entirely new set of “basic sciences.” But these criticisms suggest alternative models and are not true invalidations; in many ways they can be handled by simple extension of the biopsychosocial model.

It would seem that the only way to invalidate the model would be to disprove observations that currently seem to be exceedingly well grounded in biomedical science. For example, it might be shown that the immune system is really not altered by emotion, that endorphins affect brain states but do not influence any other bodily organs, or that the health risks associated with poverty are really caused by strictly biological or genetic factors. Basically these findings would amount to denying that interlevel feedback loops exist, and that factors at each level of organization have causative influence only within that level, which is

definitely not what contemporary scientific research is telling us.

Thus, it follows that those who would deny the validity of the biopsychosocial model cannot have scientific reasons; for they are denying, along with the model, not only a large body of scientific findings, but also a basic understanding of what it means to be a scientific clinician.⁹ Their reasons must instead be ideological. Either they wish to enthrone one sort of science as “real” science and deny the validity of other sorts of data or else they wish arbitrarily to simplify their activities by defining out of medicine all those factors that confuse or irritate them. I have argued elsewhere that it is time for the advocates of the biopsychosocial model to stop writing articles and holding academic conferences about it, and to start trying to reform the recalcitrant US health care nonsystem along the lines that the model, interpreted from a primary care focus, would suggest.¹⁰

References

1. Medalie JH: Angina pectoris: A validation of the biopsychosocial model. *J Fam Pract* 1990; 30:273–280
2. Engel GL: The need for a new medical model: A challenge for biomedicine. *Science* 1977; 196:129–136
3. Brody H: The systems view of man: Implications for medicine, science and ethics. *Perspect Biol Med* 1973; 17:71–92
4. Bursztajn H, Feinbloom RI, Hamm RM, Brodsky A: *Medical Choices, Medical Chances*. New York, Delacorte Press, 1981
5. Baughan DM: Contemporary scientific principles and family medicine. *Fam Med* 1986; 19:41–45
6. Campbell TL: Family's impact on health: A critical review. *Fam Syst Med* 1986; 4:135–323
7. Ruane TJ: Paradigms lost: A central dilemma of academic family practice. *J Fam Pract* 1988; 27:133–135
8. Foss L, Rothenberg K: *The Second Medical Revolution: From Biomedicine to Infomedicine*. Boston, New Science Library, 1987
9. Engel GL: How much longer must medicine's science be bound by a seventeenth century world view? In White KL (ed): *The Task of Medicine: Dialog at Wickenburg*. Menlo Park, California, Henry J. Kaiser Family Foundation, 1988
10. Brody H: A policy imperative for primary care: Reflections on Key-stone II. *Fam Med* (in press)