

Creativity in Management in Family Medicine

Michael J. Stephenson, MB, MCISc, and Martin J. Bass, MD, MSc
Hamilton, and London, Ontario

Family practice presents some complex patient management problems with organic, social, and psychological components. There is a great potential for creative problem solving in such patient management problems, in that many alternative solutions are possible. A cross-sectional study was carried out to test the hypothesis that "more creative people as defined by a standard creativity test would have a better quality of management." Sixteen volunteers from the University of Western Ontario Family Practice Residency Program completed a written management problem and the Barron Welsh Art Scale, which is a measure of a person's preference for complexity.

The number of options given in each answer was calculated, and the results showed that more creative residents had a higher quality of management score, a higher number of high-quality options, more options of an interpersonal nature, and a higher proportion of original options.

The results suggest that creative people are more able to generate the number and types of options that are needed for quality management. The higher proportion of original options may represent a more comprehensive approach to management, and the creative groups' preference for complexity may enable them to deal more effectively with the problem. These results are not generalizable but indicate a need for further investigation into this area.

Family physicians must manage many complex problems for which creativity on the part of the physician may increase the chances of obtaining the best outcome. This possibility results from the nature of the problem. These problems, unique to the individual experiencing them, are complex mixtures of organic, social, and psychological components. The result is that these complex problems do not have one correct management solution that can be used in all similar cases. Each management plan is unique to each particular problem, and the family physician must generate

many alternative management strategies and decide which is the best combination.

This decision-making process is further complicated by other factors. If a particular physician-patient relationship has evolved so that the patient takes an active role in making management decisions, the decision-making process is one of negotiation. This process is difficult because the physician is often only partially aware of any particular patient's perceptions, expectations, or values, especially as to how these relate to that patient's problem or its successful resolution. Consequently, the physician is unable to fully determine whether his management decisions will be either successful or acceptable to the patient. Stephens¹ summed up the situation well when he stated that the knowledge available to the physician "exhibits

From the Department of Family Medicine, McMaster University, Hamilton, and the Department of Family Medicine, University of Western Ontario, London, Ontario. Requests for reprints should be addressed to Dr. Michael J. Stephenson, Henderson Family Practice Unit, 711 Concession Street East, Hamilton, Ontario, L8V 1C3.

ambiguity, uncertainty, and some degree of incomprehensibility.”

Only two studies have looked at creativity in family medicine. Gough² studied 294 medical students using an index of creative potential and showed that the mean creativity level was highest in those who eventually went into psychiatry, internal medicine, and family practice. Family medicine was third on the list, but standard deviations from the mean were large, and any differences between these three were not statistically significant. The second study looked at the association of job satisfaction and creative inclination among 40 British general practitioners.³ The study had methodological problems, but despite this, some interesting trends became apparent. There was a significant correlation between high creative inclination and high job satisfaction and an extensive awareness of the possibility of being creative within the daily practice of family medicine.

The next step is to consider how creativity is theoretically relevant to complex problem management. Creativity can be considered from many viewpoints. Rogers⁴ stated that “the creative process is the emergence in action of a novel relation or product growing out of the uniqueness of the individual on one hand and the materials, events, persons and circumstances of his life on the other.” This definition includes three components of creativity: a product, a process, and a personality characteristic. Product criteria refer to the end product of the creative process and specifically to the attributes of the products produced in terms of their uncommonness and novelty. Process criteria refer to the thinking styles involved in creativity, an example of which would be Guilford’s⁵ divergent thinking. Personality criteria refer to specific aspects of a person’s personality that are said to make that person creative. An example would be a greater tolerance of uncertainty in a more creative person. This study concentrated on creativity as a personality characteristic.

In the literature on creativity, a personality characteristic called “preference for complexity” was identified. Barron⁶ showed that creative people, when selecting pictures, tended to pick the more complex examples offered to them. He concluded that creative people had a “preference for complexity” and devised the Barron Welsh Art Scale (BWAS)⁷ to measure this attribute. The scale is regarded as one of the best predictors of

creativity in a wide range of professions such as engineering, architecture, and physics.⁸

Because the data used in the process and the process of management decision making itself is complex, this aspect of creativity (ie, preference for complexity) may be important. Physicians who prefer complexity may be better able to manage these problems. With these points in mind, a hypothesis was tested: “More creative people as defined by the BWAS would have better quality management.”

Methods

To test this hypothesis, a method of measuring quality of management was designed. A written medical problem with organic, social, and psychological aspects was designed and pretested. The problem was a detailed case history of a 57-year-old man presenting with fatigue, who also had mild diabetes, hypertension, and family problems.

A method of measuring management using a written format was used because direct observation has not been shown to be very useful in determining how management decisions are made.⁹ The most popular written simulations are patient management problems (PMP),¹⁰ which are mixtures of diagnosis and management, although concerns have been raised about their validity.¹¹ A principal concern has been “cueing,” in which the presence of a list of alternatives results in the problem solver following leads in solving problems he may not have done normally. The use in the study of a detailed case history with a completely unstructured essay-type answer allowed exclusion of the diagnostic component of the problem and concentration on the early part of the management plan and avoided problems of cueing. The use of an unstructured free response has been shown to result in less information being elicited by the problem solver than when the structured format of a PMP is used.¹² The validity of this method of measuring management was established by comparison with a direct observation method of assessing overall competence currently used in the residency program ($r = .62$, $P = .06$).

Each study participant was asked to provide a written management plan using a format of his own choice. A scoring system was devised to calculate the number of options given in each answer. The number of options was obtained using a process called content analysis,¹³ a process by which a

Table 1. The Association of Creativity and Management: Barron Welsh Art Scale				
	Low (n = 9) Mean (SD)	High (n = 7) Mean (SD)	T Value	P Value
Quality of management score	22.89 (7.27)	32.28 (7.83)	-2.48	.03
Note: Low=score of median or less; high=score above median				

Table 2. The Quality of Management Score and Number of High-Quality Options				
	Quality of Management Score			
	Low (n =8) Mean (SD)	High (n =8) Mean (SD)	T Value	P Value
Number of high-quality options	4.13 (1.64)	8.00 (2.14)	-4.07	.001
Note: Low=score of median or less; high=score above median				

piece of prose is broken down into its component parts or, in this case, options. The options were then categorized into two major categories: (1) management option, defined as any decision or action by the physician or the patient designed to alter either the natural history of a problem or the consequences of that problem; and (2) a further diagnostic option, defined as any request for further information of any type by either the patient or the physician. These major categories were further subdivided, following Donabedian,¹⁴ into (1) technical, defined as the application of the science and technology of medicine, and (2) interpersonal, defined as the management of the social and psychological interaction between the patient, his or her social system, and the physician.

Two other variables were also used in the study. The first was a quality of management score, which was the sum of the quality scores given for each management option. The quality of an option was determined independently by three experienced family physicians. Second, a variable called the originality ratio was defined. For this study, originality was the frequency of occurrence of an option in all responses, and the ratio for any one physician was the proportion of highly original management options. Sixteen of the residents in the University of Western Ontario Family Practice Program volunteered to take part in the study and

completed the written management problem and the Barron Welsh Art Scale.

Results

Table 1 shows that people who are more creative as defined by the BWAS have a higher quality of management score. There was a high correlation between the number of options and the quality of management score ($r = .98$, $P = .001$). To determine whether this association was due to a large number of average options or to a greater number of high-quality options, the analysis in Table 2 was performed. This analysis shows that people who had a higher quality of management score had a greater number of high-quality options. The creative people also generated more options of an interpersonal nature and a higher proportion of original options as reflected by a higher originality ratio. They also requested less diagnostic information as part of their management, but this difference was not statistically significant (Table 3).

Discussion

The association of creative people as defined by the Barron Welsh Art Scale with a high quality of management may have occurred by three mechanisms. The first is that the creative group were more able to generate the numbers and quality of

Table 3. The Association of Creativity and Management: Barron Welsh Art Scale

	Low (n = 9) Mean (SD)	High (n = 7) Mean (SD)	T Value	P Value
Number of interpersonal management options	10.87 (5.14)	16.29 (5.09)	-2.13	.05
Originality ratio	0.17 (0.06)	0.29 (0.14)	-2.30	.04
Number of further diagnostic options	5.78 (4.71)	2.43 (2.37)	-1.71	.11

Note: Low=score of median or less; high=score above median

options necessary to obtain a high quality of management scores. This is supported by research in other areas. Parnes¹⁵ showed that there was a trend toward a greater proportion of good ideas as a subject's total quantity of ideas increased. The conclusion is that the quality of problem solving, or as in this study, problem management, is improved by generating as many options as possible.

The second mechanism is that the more creative groups were able to generate a higher proportion of original options, possibly reflecting a broader, more comprehensive plan of management. The third mechanism relates to the personality criteria measured by the BWAS. The BWAS is said to be a measure of a person's preference for complexity. The creative group's greater preference for complexity, as measured by a higher score on the BWAS, may have enabled them to deal more effectively with the problem. There are two possible supporting pieces of evidence. The creative group generated a greater number of interpersonal options, perhaps reflecting a possible willingness to deal with the challenging social and psychological components of a problem. The creative group also requested less diagnostic information in order to manage the problem, and this may reflect an ability to deal with a problem that is incompletely defined, as are so many of the problems seen in family medicine.

This study has shown some interesting associations between creativity and quality of management in family medicine. Because this study was a pilot study using a small sample of residents who volunteered from a family practice program, the conclusions are not generalizable. Therefore, the conclusions, although very interesting, are tentative at best and should be regarded with caution.

However, with the association shown in this study between management decision making and creativity, it would appear that this area is fertile for further theoretical development and critical research.

Acknowledgments

This study was supported through fellowship funds from the Kellogg Foundation. Ms. C. Rand provided data analysis.

References

1. Stephens GG: The intellectual basis of family practice. *J Fam Pract* 2:423, 1975
2. Gough G: What happens to creative medical students. *J Med Educ* 51:462, 1976
3. Morrison J: Satisfaction and creative inclination in a group of British general practitioners. *Med Care* 12:399, 1974
4. Rogers C: Toward a theory of creativity. In Anderson H (ed): *Creativity and Its Cultivation*. New York, Harper & Row, 1959
5. Guilford J: *The Nature of Human Intelligence*. New York, McGraw Hill, 1967
6. Barron F: *Creativity and Psychological Health*. Princeton, NJ, Van Nostrand, 1967
7. Barron F: The psychology of imagination. *Sci Am* 199:151, 1958
8. Stein M: Creativity. In Borgatta E, Lambert W (eds): *Handbook of Personality Theory and Research*. Chicago, Rand McNally, 1968
9. Barrows HS, Feightner JW, Neufeld VR, Norman GW: An analysis of the clinical methods of medical students and physicians. Report submitted to Province of Ontario, Department of Health and Physician Services, Inc, Foundation, 1978
10. McGuire C, Solomon L, Bashook P: *Construction and Use of Written Simulations*. New York, Psychological Corporation, 1976
11. Goran MJ, Williamson JW, Gonella J: The validity of patient management problems. *J Med Educ* 48:171, 1973
12. McCarthy WA: An assessment of the influence of cueing items in objective examinations. *J Med Educ* 41:262, 1960
13. North R, Holfsi O, Zarinovich M, Zinnes D: *Content Analysis*. Evanston, Ill, North Western University Press, 1963
14. Donabedian A: The quality of medical care: A concept in search of a definition. *J Fam Pract* 9:277, 1979
15. Parnes SJ: Education and creativity. In Vernon P (ed): *Creativity*. London, Penguin, 1963