Marketing, from a Kuhnian perspective, is in the earliest stage of development as a science. In this phase the emphasis should be on the generation of ideas and on discovering or developing concepts which could evolve into the foundation for marketing science. Further, efforts to get researchers to think in terms of the practical implications of their work may actually be retarding the development of a marketing science.

The primary purpose of this article is to compare contemporary marketing science against the historical development of the natural and physical sciences. Assuming that marketing will evolve along similar lines, such an analysis can be helpful in putting marketing's perceived problems into perspective, and can, hopefully, be used to aid its development.

The model used to classify the developmental stages of the physical and natural sciences is that developed by Kuhn (Kuhn 1970; Lakatos and Musgrave 1970; Suppe 1977). It is therefore assumed that 1) Kuhn's model/theory is an accurate portrayal of the development of the physical and natural sciences, and 2) that such a model/theory is applicable to marketing. Unfortunately, space limitations do not permit discussion of these assumptions, or of many of the subtleties of Kuhn's model.

The DEVELOPMENT and NATURE of SCIENCE ACCORDING TO KUHN

In the ensuing discussion the following definitions will be used:

Paradigm: Symbolic generalizations and theories, beliefs in models concerning the nature of the subject, values, and concrete problem-solutions shared by and subscribed to by at least a few of the relevant community of scholars. A paradigm essentially defines a science for those who subscribe to it. A paradigm encompasses the entire constellation of relevant beliefs, including the basic, underlying assumptions inherent in their work. Acceptable problems, methodologies, and solutions are a function of the paradigm (see Kuhn 1970, pp. 181-187).

Exemplar Paradigm: An overwhelmingly accepted paradigm. Once accepted, its premises are unquestioned until crisis arises. It is an object for further articulation and specification.

STAGES OF DEVELOPMENT

Stage 1. Pre-exemplar paradigm stage. In the earliest stages of a science activity centers on the nearly random collection of facts. These tend to be those which are most readily available. During this and the next stage the science "is regularly marked by frequent and deep debate over legitimate methods, problems, and standards of solution." (Kuhn 1970, p. 47-48). This includes debates over the scope and nature of the discipline. Eventually competing paradigms emerge, each roughly compatible with and derived from the methods of science. At this stage, it is common to see the proliferation of theories which account for phenomena.

Stage 2. Exemplar paradigm adoption stage. This transition phase is characterized by the competition of divergent schools of thought for different paradigms. Exemplar paradigms generally gain their status because they are perceived to have more potential in solving what are considered to be important problems in the discipline or science. However, because paradigms are incommensurable (that is, adherents to different paradigms tend to live in different perceptual worlds) the choice is at least partially a function of persuasive argumentation. Significantly, progress for the discipline is hard to detect until an exemplar paradigm emerges, except within each competing school. Eventually one gains prominence at the expense of the others.

Stage 3. Normal science stage. Once an exemplar paradigm has been adopted normal science begins. This consists primarily of the following: 1) the determination of facts that the exemplar paradigm has shown to be important, 2) the determination of facts that can be predicted values based on the exemplar paradigm, and finally, 3) work undertaken to resolve ambiguities of the exemplar paradigm. Initially little attention is paid to anomalies that arise during the course of research, or to problems which resist resolution. Eventually, however, dissatisfaction sets in as anomalies increase in number and stubborn problems remain unsolved, and the stage is set for a scientific revolution.

Stage 4. Scientific revolution stage. Scientific revolutions as defined by Kuhn are "non-cumulative developmental episodes in which an older [exemplar] paradigm is replaced in whole or in part by an incompatible new one." (p. 92). As dissatisfaction with an exemplar paradigm builds attempts are made to find alternative perspectives to those in the earlier stages of development, the incommensurability of paradigms hinders the direct comparison of the alternative paradigms. This period of debate occurs over the premises, meaning, and nature of the discipline, including the relevant problems to be solved, as in the earlier stages of the science's development. Eventually a new exemplar paradigm gains acceptance, and only then does normal science resume. This new exemplar paradigm essentially results in a new science—its set of relevant problems and acceptable solutions shift. As a result many former measurements and results become irrelevant.
Figure 1

STAGES OF DEVELOPMENT OF SCIENCE
(Based on Kuhn 1970)

STAGE 1: PRE-EXEMPLARY PARADIGM STAGE
- Nearly random fact gathering
- Reliance on available data
- Errors common
- Some data subsequently irrelevant
- Debates over premises of science
- Nature and scope of subject matter
- Is it a science?
- Paradigms emerge
- Generally differ over:
- Questions raised, subject coverage
- Theories proliferate

STAGE 2: EXEMPLARY PARADIGM ADOPTION STAGE
- Paradigms are compared against paradigms over:
  - Problems raised
  - Nature of solutions
  - Potential to solve 'hard' problems
  - Problems-solutions currently solved
- Paradigms are incomparable
- Debates over premises of science continue

STAGE 3: NORMAL SCIENCE STAGE
- Progress evident
- Research focuses on the articulation of the exemplar paradigm
- Follows implicit rules
- Anomalies not initially troublesome
- Theoretical normally generated
- Debates over premises not common
- Eventually anomalies build and/or stubborn problems
- Remain after repeated attempts and demand attention

STAGE 4: SCIENTIFIC REVOLUTION STAGE
- Debate over premises again common
- Paradigms/theories generated
- Extraordinary science practiced
- Paradigm is compared against paradigm
- Potential to solve 'hard' problems
- Anomalies that lead to crisis
- Problems raised/potential solutions
- Paradigms are incomparable
- Eventually one is chosen, and normal science resumes

Normal Science

Normal science, which is predicated upon the existence of an exemplar paradigm, can be characterized as research undertaken to fully articulate the paradigm upon which it is based. In other words, during normal science the emphasis is on explaining nature through the use of the exemplar paradigm. Given a problem which according to the exemplar paradigm has a solution (which may or may not be known), the scientist exerts his efforts on devising ways and methods to reach that solution. During these periods research is cumulative and progress is evident.

Note that it is the exemplar paradigm, and not pragmatic or societal considerations, which directs normal science research. According to Kuhn, "an excessive concern with useful problems, regardless of their relation to existing knowledge and techniques, can so easily inhibit scientific development." (p. 96). Hence, the future applicability of a science is enhanced and perhaps contingent upon development without regard to pragmatic problems.

It is significant to note that scientists do not, during normal science periods, look for anomalies, nor do they strive to develop theories. Findings which are at variance with the exemplar paradigm are initially set aside until, it is assumed, future developments will permit resolution of the problem. Similarly, theory generation is undertaken primarily when a crisis arises and the search for an alternative exemplar paradigm is underway. Until such time, hypothesis generation is done within the context of the exemplar paradigm or associated theories.

The education of scientists during these periods is inextricably tied to the exemplar paradigm. The training is, in Kuhn's words, immensely efficient for preparing scientists to undertake research given the exemplar paradigm, but significantly, "When (crises) arise, the scientist is not, of course, equally well prepared," and "scientific training is not well designed to produce the man who will easily discover a fresh approach." (p. 166).

The Scientific Method

Descriptions and definitions of the 'scientific method' tend to ignore the process or act of discovery, and equate, or can be construed to equate, the 'scientific method' primarily with theory evaluation, particularly the logic of justification. For example, consider Hunt: "...the scientific method consists of the rules and procedures on which a scientific community bases its rejection of the bodies of knowledge, including hypotheses, laws, and theories." (1976, p. 15). (See also Cantore 1977, p. 3; Caws 1965, p. 90; Lapedes 1978).

This interpretation of the scientific method, to the extent it is perceived as such, is probably the result of several considerations. First, the logic of justification is well developed. Second, such methods are of great value and can be useful. However, it is also likely that it is based on the perception that scientific progress is primarily the result of the scientific method so defined. To a large measure this is probably based on the perceived scientific method as it is and has been employed in those sciences where progress is evident. This consists, of course, of those sciences which have exemplar paradigms, where basic premises, assumptions, and working hypotheses are taken as given, and 'normal science' is practiced.

Two factors probably reinforce the perception of theory articulation and the logic of justification as the basis for scientific progress. The first is the history of the mature sciences as it is imparted through scientific training. Science textbooks are written from the perspective of the reigning exemplar paradigm, resulting in an illusion of continuity (Kuhn 1970, p. 138). Second, for those disciplines which have relied on the philosophy of science for guidance the emphasis of positivism and logical empiricism on the logic of justification has undoubtedly had an effect.

Regardless of how one chooses to define the phrase 'scientific method,' it is crucial to recognize the indispensable importance of the act or process of discovery, which must precede theory evaluation. This recognition is particularly important for those disciplines and sciences which are without an exemplar paradigm. Theory evaluation methods, including the logic of justification, cannot, in and of themselves, be used to find useful perspectives and theories—they can only be used to support or reject a paradigm or theory. Creative speculation and conjecturing about the phenomena in question is a critically important preliminary component vital to the development of theory.

Finally, before one can speculate about phenomena one has to be familiar with the phenomena in question. As Einstein stated, "Pure logical thinking cannot yield us any knowledge of the empirical world; all knowledge of reality starts from experience and ends in it. Propositions arrived at by purely logical means are completely empty as regards reality." (1954, p. 271). For disciplines without an exemplar paradigm, then, methods of inquiry and discovery may be critical—they may result in the birth of needed ideas. This may be particularly true with many of the social sciences, where observation may not be straightforward.

Implications for Marketing

The Current Stage of Marketing Science

It is not clear which, if any, of the social sciences have exemplar paradigms and are practicing normal science.
the philosophy of science literature it is often assumed that the social sciences are in the beginning stages of development (see, for example, Williams, Masterman, Feyere- bend, Popper, and Kuhn in Lakatos and Musgrave 1970). Further, as reported in Bergner, social scientists continually refer to being either without "paradigm" or being "multi-paradigmatic" by nature (1981). While some argue that the social sciences are inherently different from the physical sciences (see Koch 1981; Ebel 1974), it may be that the difference is simply the lack of exemplar paradigm in the social sciences.

With respect to marketing, a strong case can be made that it is presently somewhere in the pre-exemplar paradigm stage of development. Note, for example, the characteristic of nearly random fact gathering of the first stage. While an argument could be constructed that marketing has gone beyond this point, a counter-argument is implicit in Jacoby's comment that "unless we begin..." (p. 10). In addition, other evidence includes (i) the proliferation of theories and definitions, (ii) the lack of perceived progress in discovering lawlike generalizations, (iii) the relatively recent debates concerning the scope and nature of marketing, and (iv) the discussions concerning whether marketing is or is not a science. Thus, a useful first step in seeking explanation may be to observe, delineate, and define behaviors of interest to the area and perform series of simple descriptive studies to investigate them. (Peter 1981)

Other evidence to consider includes (i) the proliferation of theories and definitions, (ii) the lack of perceived progress in discovering lawlike generalizations, (iii) the relatively recent debates concerning the scope and nature of marketing, and (iv) the discussions concerning whether marketing is or is not a science. Thus, a useful first step in seeking explanation may be to observe, delineate, and define behaviors of interest to the area and perform series of simple descriptive studies to investigate them. (Peter 1981)

Given that marketing is in the earliest stages of development as a science, some of the problems of marketing, such as the proliferation of theories, definitions, and models, may not only be confounding, but may be instrumental in the development of a science. They are not unique to marketing, and they may be necessary in the search for an exemplar paradigm.

Marketing and the "Scientific Method"

If, in fact, marketing is in a pre-exemplar paradigm stage, this implies that at this juncture efforts at generating alternative concepts, perspectives, and theories need to be emphasized. That is, attempts should be focused on the process of act of discovery rather than on the logic of justification.

There are indications that marketing scientists perceive the logic of justification as being the scientific method, and as a result are placing too much emphasis on it. For example, comments from the academic study of marketing became an intellectual hostage at the very moment it considered itself worthy of the label "science." The scientific acquisition of knowledge is accompanied by the heavy weight of rigor, discipline, empirical verification, and "intersubjective validation." It also carries with it a rule by orthodoxy and the limitation of dissent. (1981, p. 16). It becomes important to look only insofar as the label science is synonymous with the logic of justification. Furthermore, Hunt's important and influential monograph is primarily on the logic of justification—the process or act of discovery receives attention primarily as a way of introducing the logic of justification. Hunt's comments on the lack of conceptual papers proposing new concepts or theories also seem indicative of researchers constrained by perceptions of the scientific method as the logic of justification.

A potential obstacle to emphasizing creativity in the generation of concepts, theories, and paradigms is the perception that it is an individual activity with no logic or method. Hunt, for example, states that "Many, if not most, major scientific discoveries are flashes of perceptual insight and not the result of following some rigorously prescribed procedure." (1976, p. 10). Consider also Cantor's comment that there is no such thing as the method of creative science—that is, discovery—is concerned. (1977, p. 54). Comments such as these seem to dismiss the process or act of discovery as unworthy of investigation. However, to the extent discovery depends on creativity, these are indications that creativity can be at least stimulated, if not developed (see, for example, Mackinnon 1978; Osborn 1963). At the very least, acknowledging that speculation and conjecturing are legitimate, critically needed activities may do much to stimulate creative thought. Finally, there are a number of methods of method which can be usefully applied in idea generation, such as the basically inductive theory-in-use approach to research (see Wilson and Chingold 1980; Reason and Rowan 1981).

According to Kuhn, it has been said that "if Greek science had been less deductive and less ridden by dogma, heliocentric astronomy might have begun its development eighteen centuries earlier than it did." (1970, p. 75). Could marketing science be following suit? Perhaps not so insignificantly Webster relates that statements that "Many of top managers in the lack of creativity of marketing managers' (1981, p. 11). While this probably reflects the basic nature of humans, it might also be marketing academics are not concerned with imparting the concepts and models that are currently available that independently thought is inhibited. Certainly the possibility is worth pondering.

Practice and Theory

It was noted above that Kuhn believes that science progresses most readily when the problems that are tackled are those which the science deems important. While 'real world' considerations can play a decisive role in the choice of phenomena to be explored by a science and perhaps in the ultimate choice of an exemplar paradigm, because of the immediate applicability of research would seem to place an unrealistic burden on any science, particularly one in the beginning stages. The practical implications of a particular time of research may not be apparent for a considerable period of time, and to justify research on the basis of 'real world' applications is unrealistic and akin to putting the cart before the horse.

This does not imply that practical implications are not important. What is needed are two kinds of research—first the 'pure or basic scientist,' whose research is aimed at explaining phenomena or testing theory, and the 'applied scientist,' whose interests are in determining the practical implications of the findings of pure science research, or with extending the boundaries and understanding of the science into practical areas. For the applied scientist the 'real world' is the focus, and the justification of research based on 'real world' considerations in this case can, perhaps, be justified.

CONCLUSIONS

Marketing is in the beginning stages as a science. As such,
many of marketing's perceived problems are characteristic of emerging sciences, and may be simply reflections of processes that are crucial to its development.

At this juncture, the scientific method from the perspective of marketing should include the process or act of discovery. There is a need to emphasize creativity, particularly with regards to the generation of concepts, theories, and perspectives. Significantly, the proliferation of theories and definitions is symptomatic of a science in search of a perspective (exemplar paradigm), and as long as they are based on empirically based hunches they can have real value. While the 'Theory of the Month' approach has little value in normal science, it is not necessarily bad for sciences without exemplar paradigms.

In addition to the need to emphasize creativity, it is desirable that scientific research in marketing not be burdened by the requirement that it have implications for practitioners. Such demands may retard the development and eventual value of the science of marketing. Hence, the current gap between theory and practice is not necessarily unhealthy.

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