

Promise and Prospects

THE CASE OF THE ALPHA, BETA, GAMMA CHANGE TYPOLOGY

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Building on Tennis's comments, the authors identify various factors that must be considered in order to put the development and application of the alpha, beta, gamma change typology in perspective. In doing so, they argue that the change typology's birth and growth shows a strong similarity to that of "normal science." After commenting on the small number of investigators involved in research on the change typology and the limited set of outlets in which this research has been published, the authors address the question of what needs to be done to accelerate the advancement of the typology and its acceptance by consultants and practitioners.

Scientists contribute to the development of knowledge through observing, theorizing, experimenting, calculating, and communicating. As scientists, we must also argue, criticize, debate, expound, and otherwise contribute to a rational consensus of ideas and information (Ziman, 1969).

In this connection, as Tennis (this issue) observes, seldom does an opportunity arise to evaluate the formation and development of an entire "line of investigation" and of the ways in which intellectual and social influences impact its course of growth. Indeed, with the exception of Cartwright's (1973) case study of research on the risky-shift phenomenon, we are unaware of any other attempt to evaluate an entire field of research, as compared to the more circumscribed work of a single scholar.

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Overall, we find little to appreciably disagree with in Tennis's largely descriptive comments. We do, however, wonder about his conclusion that the progress of the alpha, beta, gamma change typology in penetrating our discipline has been relatively slow. In the absence of comparable data from other fields of research, it would seem impossible to validate what is otherwise simply an impression. Indeed, the "natural time constants of research" are relatively unstudied and likely vary from one discipline to another (Ziman, 1969). At the height of a discovery, such as described by Watson (1968) in *The Double Helix* and by Hazen (1988) in *The Breakthrough: The Race for the Superconductor*, a few days or weeks may see the apex of a revolution. By contrast, as Ziman (1969) notes, "a decade may not be too long for successful rumination and significant progress" in simply formulating a question to be answered.

To put the development and application of the change typology in proper perspective, at least four factors must be considered. *First*, the training of consultants has traditionally not emphasized either statistical techniques or the design issues relevant for evaluating change. Rather, the emphasis has been on training to bring about change (e.g., team building, techno-structural interventions). Prior to Golembiewski et al.'s (1976) research, change programs were largely assessed through comparing mean response scores before and after a change was initiated. In contrast, the change typology requires that an evaluator understand some relatively sophisticated statistical techniques (e.g., factor analysis, factor comparison methods, covariance analysis), and design issues (e.g., the use of retrospective designs and ideal scales). Because consultants have not traditionally been trained in these areas, the continuing development of change detection procedures has fallen to a relatively small number of interested academic researchers.

Second, several of the statistical techniques necessary to detect change require large sample sizes. In contrast, traditional design approaches can be used with relatively small samples. Therefore, unless change programs are aimed at large organizations, relevant statistical techniques are impractical.

Third, a lack of convergence among findings from various methods used to detect change has also no doubt slowed the adoption of the change typology. Armenakis (1988), in reviewing research on statistical and design approaches to detecting types of change, has demonstrated that such a convergence is difficult to establish.

Fourth, objectives associated with measuring change have taken on a different focus over the last decade. Rather than establish "change" as an objective (as measured by simple mean response differences) consultants are faced with the added dimension of specifying which type of change (i.e., alpha, beta, gamma) has occurred. Furthermore, if a change program's objectives are to be specified as such, there must be concomitant attempts to measure which types of change have been achieved. The change typology has admittedly complicated a lay understanding of the change process, as well as efforts aimed at evaluating change.

The alpha, beta, gamma change typology's birth and growth over the past 12 years arguably shows a strong similarity to that of "normal science" as envisioned by Kuhn (1962). As he suggested, an initial paradigm quite often serves to stimulate collateral research whose results subsequently reveal the inadequacies of the beginning paradigm. The result in normal science is a state of crisis. Such a crisis in alpha, beta, gamma change research is evident in the measurement disorientation that has overtaken the field. The four factors identified above are evidence of this disorientation. If Kuhn's ideas about the role of crisis in the growth of a science are correct, this disorientation is evidence of genuine progress. As described by Kuhn (1962), in time, a new paradigm will emerge to likewise stimulate research whose results will reveal its inadequacies. The importance of this unending step-by-step intellectual synthesis cannot be overemphasized. Indeed, Ziman (1969) has referred to it as a "process of purification by recrystallization." With rare exception, such processes go through many stages, spread over many years.

Tennis also observes that research on the alpha, beta, gamma change typology has been conducted by a relatively small number of investigators and published in a limited set of sources. Both observations deserve comment. First, the rate of progress in any line of investigation is unquestionably affected by the media of communication (Cartwright, 1973). Theoretically, the system of communication used in science should provide a neat, workable, and timely means of information-building. Perusing Tennis's reference list, it would seem on the surface that most of the communication among those interested in the change typology has taken place through articles. As Cartwright (1973) notes, however, this mode of communication is quite time consuming, taking on the average some two years from the completion of a study to its appearance in print.

In reality, the six "key" authors Tennis identifies with the alpha, beta, gamma change typology have known one another for some time and have been familiar with one another's work well in advance of its publication. In this regard, Tennis (1986) has argued that an "invisible college" (Crane, 1972) of change typology investigators exists. It should be noted, however, that one advantage of such a college is that it allows a significant shortening of the average temporal gap between successive generations of studies, thereby increasing the rate of progress within a field.

Most of the key authors Tennis identifies were no doubt attracted to research on the change typology by the theoretical puzzle it posed. Their primary motivation was the discovery of a means for improving the measurement of change. As Armenakis states, at no time was the invisible college "closed." Admission was, and still is, open to anyone interested in contributing (see, e.g., Millsap & Hartog, 1988). It is hoped that Tennis's analysis will encourage other investigators to enter the field and thereby advance (à la Kuhn) our understanding of the change typology.

Finally, there is Tennis's observation that research on the change typology has been published in a limited set of sources. This may likely be explained by the Matthew Effect (Merton, 1968). As is true in all fields of competition, "to him who hath, shall be given." Simply put, a journal (e.g., *Academy of Management Journal* or the *Journal of Applied Behavioral Science*) that publishes articles on a specialized topic will attract other articles on that topic. This seems to be the case with research on the change typology.

The speed with which any discovery is adopted by a scientific community is certainly related to the critical mass of talent who can apply the invention to their work. Therefore, one may query, what is needed to accelerate the advancement of the typology and its acceptance by consultants and practitioners? In other words, what are the next steps?

- Research, laboratory studies, and tightly controlled field studies must be continued. Scientists must continue to refine the change process. Convergence of findings from the various approaches for detecting change is necessary. Development of techniques that can be used with small sample sizes is also needed.
 - Credit and noncredit educational programs for consultants and practitioners should cover the change typology and techniques for its detection. Certification/licensure procedures may be needed and should incorporate both topics.
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- A "lay" explanation of the change typology describing its benefits would be helpful in stimulating interest among consultants and practitioners.

In conclusion, the scientific advancement of knowledge is ideally a corporate activity in which a community of scholars achieves far more than the sum of its individual members' efforts (Ziman, 1969). To this extent, given that research on the alpha, beta, gamma change typology is only some dozen years old, the rate of progress achieved to date should not be criticized too harshly. Each new contribution to the field represents one piece in a yet uncompleted puzzle. In this sense, we agree with Tennis's belief that the thorny questions raised by the change typology will be considered and debated for some time into the future—a future that promises great excitement.

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