AN INVESTIGATION OF THE RELATIONSHIP
BETWEEN JUNCIAN PSYCHOLOGICAL TYPE
AND PREFERRED STYLES OF INQUIRY

DISSERTATION

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* * * * *

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INTRODUCTION

What method of inquiry produces the kind of knowledge that best contributes to our understanding of human and social reality? If a comparable question were posed to a physical scientist, his or her reaction would likely be one of puzzlement. A physicist, for example, acquires and applies what has become a universally sanctioned collection of quantitative and experimental skills. Except during those rare periods of scientific upheaval, the physicist is concerned, not with questioning, but with applying his or her methodological training in the pursuit of physical knowledge. For this type of scientist, the question is not "Should I use quantitative techniques to investigate nature?" but, rather, "Where does theory suggest is the most promising area for me to apply them?". Indeed, a shared methodological system of experimental and mathematical strategies and techniques is unextricably bound to the concept of "doing science" (Kuhn, 1962).

This methodological unanimity is not to be found among those who struggle to achieve comparable success in the human and social sciences. For this community of inquirers, the methodological question has always been and continues to be a source of great concern and intense debate. Kaplan (1964) summarized the magnitude of this issue by stating that,

Schools of thought in behavioral science today are often identifiable as much by the methods they apply as by the theories they espouse. There are the experimenters,
those focusing on measurement, the devotees of statistics, the theoreticians, and now the model builders. Each method, to be sure, comprises a variety of techniques, some of which may stand opposed to one another. But underlying the variety in each case is a unity of purpose, in a perspective which sees that method as the most significant type of scientific activity (Italics, mine) (p. 275).

Although Kaplan's list of methodological positions perhaps seems too exclusive, he has, nonetheless, captured the essence of the problem, viz., in the social sciences, methodology is perceived to be crucial to the development of knowledge about human and social reality. The crux of the problem, however, is that there is widespread disagreement about which methodology produces the type of knowledge that will significantly enhance this understanding. Kaplan pointed out further that this lack of methodological consensus frequently results in rancorous debate among advocates of opposing methodological systems. Kaplan wrote,

Verbal assent may be given to the truism that each of the methods has its place, but commitment of practice, very often, is to attitudes of defensive incorporation and exclusions: this is the only thing worth doing. Of course, each of the methods does assign a place to the others: their function is to serve its own needs ... None of the methods is appreciated by the others in terms of its own problems and interests; each asks only "What's in it for me?". This state of affairs is not limited to behavioral science, nor is it something new in the history of any of the sciences. But that the disease is pandemic does not make it any less virulent here and now (pp. 275-76).

Kaplan's observation that not only do significant methodological disputes exist in the social sciences, but that they are addressed with such "virulence" has also been discussed by scholars from disciplines outside the social sciences. Historian of science
Thomas Kuhn (1962) claimed that he developed his concept of the scientific "paradigm" from his experience at the Center for Advanced Studies in the Behavioral Sciences. Kuhn explained that,

... spending the year in a community composed predominantly of social scientists confronted me with unanticipated problems about the differences between such communities and those of the natural scientists among whom I had trained. Particularly, I was struck by the number and extent of the overt disagreements about the nature of legitimate scientific problems and methods. Both history and acquaintance made me doubt that practitioners of the natural sciences possess firmer or more permanent answers to such questions than their colleagues in social science. Yet, somehow, the practice of astronomy, physics, chemistry, or biology normally fails to evoke the controversies over fundamentals that today often seem endemic among, say, psychologists or sociologists. Attempting to discover the source of that difference led me to recognize the role in scientific research of what I have since called "paradigms" (viii).

In an excellent discussion of the methodological problems facing social scientists, philosopher of science Ernest Nagel (1961) similarly observed that the lack of methodological consensus is one of the major impediments to the development of the social sciences. Nagel maintained that "... the social sciences often produce the impression that they are a battleground for interminably warring schools of thought ... it's a matter of public record that social scientists continue to be divided on central issues in the logic of social inquiry ... (p. 448).". Philosopher of science May Brodbeck (1968) also used a military analogy to describe the nature of methodological debate in the social sciences. Brodbeck viewed the intense hostility expressed by opposing methodological factions as akin to "a bootless cold war (p. 3)".
Social scientists themselves have commented upon the often pugilistic nature of their methodological debates. Homans (1949), for example, urged that questions of methodology should be addressed on a strategic rather than a moralistic level of discourse. Illustrative of the chronic nature of these debates, Bakan (1967) argued that the moralistic fervour which surrounds methodological disputes may be due to the fact that both science and religion have a pronounced tendency toward idolatry. Indeed, Bakan coined the term "methodolatry" to describe the emotional intensity with which proponents of different methodologies argue their respective investigative points of view. Ian Mitroff aptly synthesized the aforementioned military and religious analogies by maintaining that methodological debates among competing social science factions closely resembled "religious warfare" (personal communication, 1979).

What are some possible explanations for the acrimony that so often permeates methodological debate in the social sciences? The disciplinary literature that discusses issues of methodology typically does so by addressing the relative advantages and disadvantages of various techniques of inquiry. At this level, differences among competing methodological positions are quite obvious. Advocates of, for example, participant-observation and case study methodologies clearly employ procedures quite unlike those found in the methodological toolbox of a laboratory experimentalist. Indeed, even within the currently dominant experimental-quantitative paradigm of inquiry, proponents of correlational analysis and experimental design differ on questions of strategy and technique (Cronbach, 1957, 1975). It
seems unlikely, however, that purely technical disagreements should evoke such antipathy among competing methodological schools of thought. Indeed, some authors (see, e.g., Mitroff and Bonoma, 1978; Mitroff and Kilmann, 1978) have suggested that these disagreements are, in fact, symptomatic of much more fundamental differences; differences significantly deeper than those expressed at the level of technique. That is, it may be the case that, as these authors contend, disputes over methodology mask more profound disagreements regarding the value of significantly different modes of conceptualizing, investigating, and thus knowing human and social reality. Perhaps the rancor of these disputes results less from differing attitudes toward procedure, per se, and more from the clashing of fundamentally different ways of thinking and learning about man and society. If this thesis is true, then debates over methodology are likely to be intertwined with more fundamental assumptions regarding both the nature of the world and how to investigate it.

A number of historians and philosophers of science suggest that methodological orientation does, in fact, reflect more profound beliefs about reality. Drawing from the research of the Gestalt psychologists (see, e.g., Kohler, 1947), Hanson (1958) argued that even the act of "raw" perception itself is fundamentally involved with prior assumptions about the world. Contrary to the reconstructed logic of Baconian inductivism, Hanson contended that the understandings that we derive from the act of observation do not emerge subsequent to our perception of "unbiased" sense data, but, rather, are significantly influenced by the theoretical presuppositions we hold at the
moment of observation. That is, Hanson maintained that the act of observation itself is, of necessity, "theory-laden". Although this thesis appears to contradict the traditional distinction between observational and theoretical terms (Hempel, 1957), scholars from other fields of study have argued very similar points of view (see, e.g., Feyerabend (1975); Rozsak (1969); Arnheim (1969)).

Hanson illustrates the crux of his argument by stating

Let us consider Johannes Kepler: imagine him on a hill watching the dawn. With him is Tycho Brahe. Kepler regarded the sun as fixed: it was the earth that moved. But Tycho followed Ptolemy and Aristotle in this much at least: the earth was fixed and all other celestial bodies moved around it. Do Kepler and Tycho see the same thing in the east at dawn? (Italics, the author) (p. 5).

Do Tycho and Kepler see the same thing? In one sense they do. They perceive a common event. Does, however, this hypothetical sense experience precede inferences regarding the structure of the universe or does it confirm existing (and diametrically opposite) cosmological presuppositions? Philosopher F. C. S. Northrup (1958) appeared to implicitly endorse the latter view. Suggesting the scientific implications of Hanson's position, Northrup argued that,

Unquestionably, one other thing is clear. An analysis of specific experimentally verified theories of modern physics with respect to what they say about the object of human knowledge and its relation to the human knower exhibits a very rich and complex ontological and epistemological philosophy which is an essential part of the scientific theory and method itself. Hence, physics are neither epistemologically nor ontologically neutral (p.25).

Northrup insisted further that verification of a physical theory, ipso facto, verified the particular ontological and epistemological philosophy upon which it is built. Historian A. C. Crombie (1959)
took a position similar to Northrup when he addressed the relationship between these scientific "world-views" and the methodological practices they, in his view, necessarily entailed. Crombie wrote that,

In other words, a method that aims at finding explanations is of little use in science except in association both with a conception of the kinds of causes, principles, and laws the method is expected to discover and with a knowledge of necessary mathematical and experimental techniques, and in fact all discussions of scientific method have presupposed such a "conception of nature" .... (p. 86).

Kuhn (1962) argued that significant scientific change is the result of "revolutions" in a scientific community's "conception of nature". Kuhn used the term "paradigm" to define the vast constellation of assumptions which underlie these fundamental world-views. Kuhn stated that a paradigm includes congeries of conceptual, theoretical, and methodological commitments about both the nature of reality and the proper way of investigating it. He asserted that these assumptions operate covertly in the normal practice of science. That is, they implicitly direct inquiry into fruitful substantive domains. It is only when certain intractable research "anomalies" persist that the value of the current paradigm begins to be questioned. It is during this "crisis stage" that competing schools of thought emerge to challenge the adequacy of the faltering paradigm's fundamental philosophical and theoretical infrastructure. Indeed, Kuhn argued that this phenomenon also occurred prior to the establishment of any guiding scientific paradigm. He contended that there is extensive and vigorous debate among proponents of differing world-views during this initial "pre-paradigm" stage of disciplinary development. An extensive literature in the history of seventeenth
century science appears to confirm Kuhn's thesis as well as provide a fascinating perspective on the clash of the different "conceptions of nature" that competed for the minds and imagination of early seventeenth century man (see, e.g., Butterfield, 1957; Burtt, 1954; Hall, 1962; Kearney, 1971; Sambursky, 1974). Kuhn explained this phenomenon by stating that,

early developmental stages of most sciences have been characterized by continual competition between a number of distinct views of nature, each partially derived from, and all roughly compatible with, the dictates of scientific observation and method. What differentiated these various schools was not one or another failure of method - they were all "scientific" - but what we shall come to call their incommensurable ways of seeing the world and practicing science in it. (p. 4)

Does the Kuhnian concept of paradigm development have implications for the social sciences? Perhaps so. The intensity of the methodological debate in the social sciences suggests that these competing factions do, in fact, possess "incommensurable ways of seeing the world and practicing science in it." Indeed, it may be the case that these debates, to some degree, parallel the debates among competing sixteenth and seventeenth century scientific worldviews. Kuhn argued that, in fact, there is a great deal of similarity between the two phenomenon. In his view, debates among contemporary social scientists involve fundamental questions regarding what is to count as truly "scientific" and, as such, as potentially fruitful to the study of man as the seventeenth-century Mechanical- Corpuscular paradigm was to the study of nature. If the Kuhnian thesis is true, then methodological disputes among social science factions may likewise be symptomatic of conflict among competing worldviews; each
possessing its own assumptions about the nature of human and social reality.

Although not extensively addressed, the idea that methodological practice is inextricably tied to a more abstract system of beliefs about the world has been discussed in the social science literature. Madge (1965) argued the relevance of the Kuhnian position to social science methodology by contending that methods of inquiry necessarily reflect presuppositions about a substantive domain. Gouldner (1970) similarly asserted that all social inquiry is bound to "certain prior assumptions about society and men and, indeed, certain feelings about and relations to society and men (p. 28)". Gouldner used the term "domain assumptions" to describe the world-views which inform inquiry within a substantive field. He contended further that these assumptions directly influenced methodological practice. In his words,

Domain assumptions concerning man and society are built not only into substantive social theory but into methodology itself .... When viewed from one standpoint "methodology" seems a purely technical concern devoid of ideology; presumably it deals only with methods of extracting reliable information from the world, collecting data, constructing questionnaires, sampling, and analyzing returns. Yet it is always a good deal more than that, for it is commonly infused with ideologically resonant assumptions about what the social word is, who the sociologist is, and what the nature of the relation between them is. (pp. 49-51).

Rist (1978) took a similar position by contending that social science methodology reflects "an interrelated set of assumptions about the social world which are philosophical, ideological, and epistemological (p. 43)". As such, Rist argued, selecting a methodology is, in effect,
selecting a particular way of knowing. That is, Rist claimed that what is known is to a large degree a matter of how one knows. He summarized this interrelationship by insisting that,

... stating the problem, giving it definition and form, as well as selecting the appropriate methodological techniques for its analysis are the result of the paradigmatic spectacles one sees fit to wear (p. 47).

Not only do these deeper assumptions serve to direct inquiry within certain methodological boundaries, they also operate to erect "blinders" to alternate modes of conceptualizing and investigating human and social reality (Messick, 1978). Phillips (1973) contended that this phenomenon, although inevitable, served to limit a broader and perhaps more comprehensive view of social reality. That is, adherence to a particular methodological system, of necessity, circumscribed both the range and type of knowledge that may be created. Petrie (1976) directly addressed the consequences of this "blinder effect" when he contended that the major difficulty in implementing interdisciplinary research efforts is the failure to appreciate the fact that disciplines use different "cognitive maps". Similar to Gouldner's "domain assumptions", these cognitive maps serve to dissect a shared phenomenon into distinctly different observational categories. Petrie suggested that not only do these tacit world-views articulate the proper focus of substantive attention, but that they also imply different methodologies for investigating it.

Although, as Petrie asserted, different modes of inquiry may emerge from diverse disciplinary matrices, they are not necessarily bound to them. That is, while methodological positions represent ways
of looking at the world which may be congruent with disciplinary obser-
vational categories, they also exist as more general epistemological
positions which often cut across strict disciplinary boundaries. As
such, the nature of methodological debates within the various social
sciences is remarkably similar. Nagel (1962) expressed the fundamental
character of these transdisciplinary debates by stating that

   In particular, there is a long-standing divergence in
   professed scientific aims between those who view the
   explanatory systems and logical methods of the natural
   sciences as models to be emulated in social research,
   and those who think it is fundamentally inappropriate
   for the social sciences to seek explanatory theories
   that employ "abstract" distinctions remote from familiar
   experience .... (p. 449).

Indeed, this polarity appears to underlie most debates in the social
sciences. Although the nature of the disputes are quite similar
across the social sciences, the substance of the disagreement is
typically among investigators operating within specific substantive
areas. That is, the clash of methodological world-views is largely
an intra-disciplinary phenomenon.

In the discipline of psychology, Hultsch and Hickey (1978)
contended that while different "metaperspectives" underlie research
in human development, the "mechanistic" metaperspective has evolved
as the dominant world-view which informs the vast majority of inquiry.
Hultsch and Hickey argued that this model posits man's development as
causally caused by potentially knowable and reducible external factors.
Through these "paradigmatic spectacles", man is viewed as a highly
complex mechanism. To understand him, therefore, is to understand
the external forces which "push" the mechanism to change and develop.
As a consequence of this world-view, the methodology used to investigate man's development focuses upon precise measurement and experimental controls. The methodology derived from this metaperspective thus produces knowledge based largely upon linear models designed to posit man's behavior as a series of separate, but quantitatively interrelated components. That is, under the aegis of this influential metaphor, man's actions, while complex, are nonetheless capable of lawful understanding. Thus, the key to understanding is through the discovery of the fundamental antecedent-consequent relationships which propel humans to develop in predictable ways. Polanyi (1959) similarly argued that this mechanical model underlies most psychological knowledge. Polanyi contended that,

The study of psychology shows a .... tendency toward reducing its subject matter to explicit relationships between measured variables; relationships which could always be represented by the performances of a mechanical artifact (p. 262).

Like Polanyi, Maslow (1966) argued that this influential world-view guides most inquiry in the human sciences. Indeed, in Maslow's judgement, it has become virtually the sole paradigm of psychological research. Maslow articulated the conceptual focus of this model by stating,

The search for a fundamental datum (in psychology) is itself the reflection of a whole world view, a scientific philosophy which assumes an atomistic world -- a world in which complex things are built up out of simple elements. The first task for such a scientist then is to reduce the so-called complex to the so-called simple. This is done by analysis, by finer and finer separating until we come to the irreducible. (pp, 3-4).
Finkelman (1978) expressed the fundamental concern of those who argue against the dominance of this model of inquiry by asserting that,

Any attempt to impose a single perspective or paradigm on psychology must overlook, ignore, or suppress significant aspect of human reality. (pp. 191-192).

Finkelman's contention illustrates the fundamental problem facing not only psychology, but, as Phillips pointed out earlier, all social science disciplines, viz., there is widespread disagreement regarding what, in fact, are the "significant aspects" of human reality. In a very real sense, the methodology employed, ipso facto, defines what dimensions of reality are to count as vital to increasing our understanding of man.

Disagreements over these dimensions are also reflected in the methodological debates among sociologists. Wilson (1970) presented a lucid discussion of the methodological practices which obtain from adherence to two fundamentally different conceptions of social interaction. Wilson identified these two approaches as the Narrative and the Interpretive models of inquiry. He argued that the Narrative approach has as its philosophical underpinnings the traditional "physical science" model of inquiry. As such, this methodology creates knowledge appropriate for deductive explanations of social interaction. That is, like Hultsch and Hickey's mechanistic meta-perspective, Wilson's Narrative paradigm conceives of man from an investigative framework which largely ignores the influence of his immediate social context. Wilson contrasted this perspective with the Interpretive model which views man's social interactions as comprehensible only through an understanding of the complexities
of his particular social context. As Wilson pointed out, this latter conception of man's behavior entails a very different explanatory and methodological system, viz., pattern explanations derived from methodological procedures such as ethnomethodology (for a thorough discussion of both pattern and deductive explanations and their relevance to the social and behavioral sciences, see Kaplan, 1964, Chaps. 38 and 39). Like Wilson, Phillips (1973) argued that most sociological methods reflect two distinct ways of viewing social reality. The erklären approach represents the traditional mechanistic paradigm and, as such, utilizes procedures which produce objective, precise, and reliable descriptions of the external factors that affect social behavior. Phillips contrasts this approach with the verstehen model of inquiry which focuses on man's inner, subjective reality. The "verstehen" position defines man's significant reality solely in terms of internal, personalistic dimensions. Clearly, these two methodological world-views lead to the creation of two very different types of knowledge.

Education, while perhaps not a discipline, per se, is nonetheless a field of social or human inquiry informed by multiple methodological perspectives (Popp, 1975). Popkewitz (1973) argued that the traditional scientific model or, in his words, the "Behavioristic" approach dominates most inquiry directed at understanding the teaching-learning process. Popkewitz articulated the influence of not only this, but all, methodological world-views, by stating that
A climate of opinion provides a way of talking about a world pattern or Weltanschauung, which imposes upon men in an age a peculiar use of intelligence and a special type of logic in looking at human activity. Each age has preconceptions that provide men with certain unpostulated and unlabeled assumptions about what the world is like .... The assumptions are so deeply rooted in a particular theorist's personal reality that they are almost never questioned and become "facts" that tend to structure the perceptions of the theorist and shape his subsequent theorizing (p. 32).

Popkewitz maintained that such a Weltanschauung underlies "scientific" educational research methods. He argued that the consequence of this prevailing world-view is that students are "objectified" and analyzed to the point where an understanding of their uniqueness is totally overlooked. Popkewitz summarized the arguments against this dominant methodological world view by stating that,

Detachment, rigor, harmony, and a "thingafied" man provide educators with an illusion of knowledge about educating. We have believed that there is a standardized image towards which children's behavior can be modified ... the scientific metaphor has functioned to enshrine security and regularity and eliminate uniqueness and ambiguity from daily encounters (p. 37).

Rist (1978) expressed similar reservations over the influence of educational methodologies derived from the mechanistic paradigm and, like Popkewitz, contended that educational inquiry is currently dominated by this experimental-quantitative model of investigation. Similar in nature to Phillips erklären approach, Rist argued that this methodology posits detachment and objectivity as the proper way of investigating man. The author argued, however, that another perspective, the qualitative approach, is becoming more influential among educational researchers. Like Wilson's Interpretive model, this methodology directs attention to a conception of man which
emphasizes the importance of his inner, subjective reality. Rist argued that adherence to either of these methodological paradigms profoundly alters the way in which an investigator views his investigative domain. Indeed, in Rist's judgement, the effect of these "paradigmatic spectacles" permeated all aspects of the educational inquiry process. More significantly, he contended that narrowly focusing upon questions of methodology, per se, ignores the larger and more fundamental problem of articulating the background assumptions each methodology carries with it. Thus he argued that,

It is important to ferret out these "unquestioned assumptions" and subject them to examination before one attempts to assess the relative contributions of various research strategies. This is so because ultimately, the issue is not research strategy, per se. Rather, the adherence to one paradigm as opposed to another predisposes one to view the world and the events within it in profoundly different ways. The power and pull of a paradigm is more than simply methodological orientation. It is a means by which it grasp reality and give it meaning and predictability. (p. 43).

If it is reasonable to believe that different methodological positions in the social sciences reflect different conceptions of human and social reality, it seems likely that attempts to argue for or against the merits of a particular perspective at the level of technique are at best problematic and, at worst, superficial. That is, if Rist is correct, the "power and pull" of a methodological paradigm may be the result of factors not typically addressed in discussions of social science methodology.

Up to this point, this focus has been upon the concept of methodology viewed in the abstract. It has been asserted that underlying a particular methodological point of view rests a complex of
assumptions regarding the nature of both the world and the proper way of investigating it. These assumptions and the ensuing debates about them do not, of course, exist independently of the investigator himself. What has been missing from the discussion thus far has been mention of the potential relationship between a particular methodological worldview and the human being who adheres to it. If it is true that different methodological perspectives reflect implicit assumptions about human and social reality, might it not also be true that one's attraction to and/or advocacy of a particular system of inquiry is suggestive of a congruence between that worldview and one's own "weltanshauung"?

Statement of the Research Question

Do psychological factors affect preference for a particular methodological worldview?
REVIEW OF THE LITERATURE

The literature in the psychology of science indicates clearly that psychological factors significantly influence the practice of science. Indeed, the portrait of the scientist presented by this literature suggests a psychological texture as rich and as variegated as the elusive natural phenomenon he or she so passionately pursues (see, e.g., Eiduson, 1962; Kubie, 1953, 1954; Mahoney, 1976; Mitroff, 1974b; Polanyi, 1958; Roe, 1951, 1953, 1954, 1961). Of greater significance, however, is the fact that what scientists know of physical reality is, in large measure, a consequence of the disciplined interaction between their collective psyche and the intractable facts presented by nature. For indeed, as Levine (1974) and Mahoney (1976) pointed out, it is the investigator himself who serves as the ultimate instrument of science. Thus, in a very real sense, what we know of nature is derived as much from the way scientists think as it is from the experimental verification of that thinking. The influence of the scientist's inner reality on the type of knowledge he or she produces led Watson (1938) to argue that,

Scientific truth and scientific method are, then, to a great extent relative to (that is, dependent upon) the mental world of the operator and to the social organization from which they spring.... We must be less concerned with: What has the scientist done? More with: What sort of fellow is he? Thus, when we say that scientists are human we are directing attention to the fact that science -- far from the work of an abstract automaton or unemotional mechanism -- is inextricably intertwined with the paradoxes and tragic imperfections of human nature. (Italics, the author) (p. 8).
Watson contended that, because he is human, the scientist cannot avoid projecting his personality into the development of his theories or the conduct of his experiments.

Other authors have addressed this intriguing concept by similarly arguing that a scientist's personality type significantly influences the way he or she both conceptualizes and investigates physical reality.

French physicist and philosopher Pierre Duhem (1914) argued that there were two types of scientific temperament: the Continental and the English. Duhem viewed the former scientific type as inclined toward the symbolic and mathematical ordering of scientific knowledge, while the latter focused on the creation of less systematic, but more imaginative and visual models of nature. Duhem believed that these two broad conceptual orientations to science, the mathematically abstract and the visually concrete, resulted in two different types of theory, viz., the Continental mathematical theories vs. the English mechanical theories.

The German chemist Wilhelm Ostwald (1919) similarly viewed scientific thinking as a dichotomy between two fundamental psychological predispositions. Examining the biographies of several famous scientists, Ostwald determined that these eminent men could be categorized as either "classical" or "romantic" in their approach to inquiry. Ostwald maintained that the classical researcher took great pains to perfect a few scientific projects, while the romantic type was more likely to become actively involved in a variety of research activities. Ostwald further maintained that while the comparatively single-minded Classical scientist tended to be shy and retiring, the
quick-silver temperament of the Romantic investigator led him to be more outgoing and charismatic. The author argued that the crux of these differences was to be found in the differential rate of mental reactivity between the two types. Swiss psychiatrist Carl Jung (1971), however, disagreed with this analysis, contending, instead, that the fundamental difference was between the classical type's introversion as opposed to the extroversion inherent in the Romantic researcher's personality. In his essay on Tolstoy's view of history, Isaiah Berlin (1954) divided not just scientists, but all thinkers, into two intellectual modes: the Hedgehog and the Fox. Berlin illustrated this dichotomy by quoting the Greek poet Archilochus who observed that

   The Fox knows many things, but the Hedgehog knows one big thing. (Berlin, P.1)

Berlin speculated that the Hedgehog's thinking was dominated by a single vision, i.e., a single universal organizing principle which served as the underpinning for his intellectual orientation to the world. The Fox, on the other hand, both relished and pursued the multiplicity and variety of experience. Whereas the Hedgehog was organized and coherent in the pursuit of the "one", the Fox tended to be scattered and diffuse in his appreciation of the "many". In some ways similar to Ostwald's typology, Berlin's intellectual dichotomy, however, focused less on the process of intellectual activity than the products derived from the way different types of thinkers conceptually organized their experience. Like Ostwald, however, Berlin maintained that these two distinct psychological
worldviews had a profound effect on both the process and nature of intellectual creativity. Philosopher William James (1978) similarly claimed that most thought expressed, in his words, "the mental make-up" up two fundamentally different intellectual temperaments: the tender-minded and the tough-minded. James argued that the tender-minded person tended to be rationalistic, i.e., he viewed the "stuff" of the world as exemplars of a few universal principles. The tough-minded person, on the other hand, tended to be skeptical of unitary visions, preferring, on the other hand, to analyze particulars as the basis from which to understand his environment. James pointed out that the tender-minded person was also likely to be idealistic, optimistic, and dogmatic, while the tough-minded individual was more prone to be more materialistic, pessimistic, and skeptical. These opposite personality and intellectual predispositions, James argued, led to a great deal of antagonism between these two types. James wrote:

The tough think of the tender as sentimentalists and soft-heads. The tender feel the tough to be unrefined, callous, or brutal... Each type believes the other to be inferior to itself. (p. 14).

While both types of thinkers are actively involved in the creation of knowledge, they do so from very different conceptual frameworks. Indeed, the predictable animosity which James asserted existed between these two worldviews is not unlike that found in the aforementioned debates among "warring factions" within the social science research community. Sociologist of science Ian Mitroff (1974b) observed similar "personality clashes" among scientists involved in the
Apollo moonrock project. Mitroff categorized these scientists into three groups. At one extreme were the bold speculators whose main concern was the construction of imaginative conceptual models (type I). At the other end of the psychological spectrum were the scientists who rarely ventured inferences beyond the dictates of the experimental data (type III). The type II scientists were judged to have attributes similar to both type I and III investigators, though to a lesser degree. Mitroff found that these scientists were well aware of this difference in conceptual focus and often used it as the basis from which to criticize the work of scientists possessing a different investigative orientation. This was especially true of the more conceptual type I and type II scientists who described the more data-bound type III investigators as "number crunchers" and "unimaginative clods". Interestingly, most of Mitroff's 42 member sample rejected the image of scientists as unbiased and objective. Indeed, the consensus was that the best scientists were those who were highly partisan and committed to their particular theories. In fact, Mitroff pointed out that it was the relatively narrow and conservative type III scientists who were viewed as the most unbiased.

Nobel Laureate Albert Szent-Györgyi (1974) touched upon a theme similar to that of Ostwald and Berlin when he argued that there were two dominant psychological orientations in the physical sciences: the Apollonian and the Dionysian. Similar to Kuhn's concept of the "normal scientists", Szent-Györgyi suggested that the Apollonian Scientists tended to systematically focus their attention within a well-established research tradition. The Dionysian investigator, on the other hand, was much more inclined to rely on intuition and subjective insight as
a guide to his inquiry. The author further contended that this
difference in orientation had important political implications. That
is, according to Szent-Györgyi, current scientific funding policy
tended to favor the more established Apollonian approach to inquiry
over the more heuristic research performed by the Dionysian scientists.
Historian of science Gerald Holton (1973) noted a similar scientific
dichotomy when he wrote.

There has always existed [a] set of antitheses or polarities, even though, to be sure, one or the other was at a given
time more prominent -- namely between the Galilean (or, more properly, Archimedean) attempt at precision and
measurement ... and, on the other hand, the institutions, glimpses, daydreams, and a priori commitments that make up
half the world of science in the form of a personal, private, "subjective" activity. (p. 375)

Perhaps the most well known example of this relationship between
personality and the practice of science comes from Albert Einstein.
In a dispute with physicist Niels Bohr over the stochastic nature of
quantum theory, Einstein remarked that "God does not play dice with
the Universe" (Bernstein, 1967). In many ways, Einstein's assertion
expressed his own fundamental belief in a well-ordered and harmonious
universe and, as such, the comment stands as much an indicator of his
psychological world-view as it does a metaphysical principle.

If personality plays an influential role in the type of knowledge
generated within disciplines where methodological and theoretical
consensus is quite high (Kuhn, 1962; Lodahl and Gordon, 1972), it
is likely that a similar examination of the personality factor in
relatively low consensus research fields will reveal an even more
complex portrait of the interaction between psychological orientation
and predilection for diverse styles of inquiry. Indeed, Mitroff
(1974a) has argued that the degree to which personality is creatively involved in the conceptualization of research depends on the extent to which the problem of interest has been defined. In Mitroff's view, ill-defined research areas offer the greatest opportunity for the investigator to express his or her "weltanschauung" in both the development and solution of a research problem. While this opportunity may be limited to the "pre-paradigm" or "revolutionary" stages of development in the physical sciences, the chronic methodological and theoretical disputes within the social and behavioral sciences render these research domains conducive to the enduring influences of not only methodological, but, at an even more fundamental level, psychological world-views. Mitroff and Bonoma (1978) suggested this position by arguing that,

Our assumptions about science and any other particular behavioral phenomenon we choose to investigate are so inextricably tied up with our own personalities as researchers that examining one requires examining the other. (p. 254).

Ironically, however, little attention has been directed to the nature of this putative interaction in the social and behavioral sciences. In one of the few explicit, albeit brief, mentions of this phenomenon, Kaplan (1964) maintained that "cognitive style" exerted a powerful influence on the way social scientists address research problems. Kaplan suggested that these different cognitive orientations focused investigative attention onto different dimensions of a research situation.

Citing Charles Pierce's judgement that not all scientists possess a "laboratory mind", Kaplan outlined several general cognitive
styles used to conceptualize and investigate substantive research questions. Two particular styles, the literary and the eristic, stand out as distinctly different modes of thinking used by inquirers to order and investigate social and behavioral phenomenon. Kaplan described the literary style as a way of thinking that focuses upon human individuality and uniqueness. He argued that an investigator who possesses an eristic cognitive style, on the other hand, focused his attention on the discovery and testing of propositions which apply to humans, not individually, but as a collective entity. Thus, it seems likely that the literary inquirer would be naturally attracted to the methodological world-view which underlies the verstehen approach to inquiry presented earlier by Phillips (1973). Kaplan was much more explicit regarding the type of inquiry pursued via the eristic cognitive style. He stated that this way of viewing the world corresponded to the traditional experimental-quantitative model of inquiry so pervasive in contemporary social science research. In this regard, the eristic investigator would likely be attracted to Hultsch and Hickey's mechanistic metaperspective and perhaps to Phillips' enklären approach to inquiry.

Although Kaplan's brief excursion into cognitive style has increased our understanding of the potential impact of personality on the way social and behavioral research is conceptualized and conducted, he made no attempt to explain the relationship. While recognizing the importance of the person-methodology nexus, Kaplan did not directly address the question of how and why cognitive style may be related to particular methodological world-views. We are
thus left in the dark regarding the psychological factors which may
initially predispose a researcher toward, say, a literary rather
than an eristic way of conceptualizing the subject of inquiry.
Fortunately, a preliminary investigation into the nature of this
question has been initiated by Ian Mitroff and Ralph Kilmann (1978)
in their recent work *Methodological Approaches to Social Science*.

Mitroff and Kilmann set the stage for their heuristic synthesis
of psychological and methodological diversity by stating that,

The tension between different views of science and
scientific method in Western culture has reached the
point at which it can no longer be ignored. When
fundamental differences in attitude persist so long,
and with such intensity not only should we take them
seriously but we should regard them as surface symp-
toms of a deeper phenomenon. (p. vii)

The authors advanced the speculative hypothesis that, in fact, much of
the "warfare" among competing methodological perspectives in the
social sciences can be understood by examining the personalities of
their proponents. Specifically, Mitroff and Kilmann contended that
preference for a particular style of inquiry is the consequence of a
mesh between the "weltanschauung" reflected in a methodological
position and one's own orientation to the world. They argued that the
nature of this congruence may be at least partially explained by
Swiss psychiatrist Carl Gustav Jung's theory of psychological type
(1971).

Perhaps better known for his extensive writings on the uncon-
scious, Jung nonetheless was concerned with the way individuals
consciously oriented themselves to their external environment. Drawing
upon his vast clinical experiences as a practicing psychotherapist,
Jung published his *Psychological Type* in 1923 as an attempt to articulate the differences between his views and those of his former colleagues Sigmund Freud and Alfred Adler (Jung, 1963). The main thesis of *Psychological Type* is that, in Jung’s words, "... every judgment made by an individual is conditioned by his personality type and that every point of view is necessarily relative (p. 207)". More specifically, Jung argued that man's orientation toward the world was mediated by one type of attitude and two types of functions.

Jung claimed that a person's overall orientation to the world consisted of one of two general attitudes: extroversion or introversion. In general, the extroverted attitude focuses attention on understandings derived directly from objects present in the external environment. The introverted attitude, on the other hand, leads one to understand the meanings of those objects, not directly, but, rather, through one's subjective, inner reality. In a sense, the extrovert focuses his energy on the objects of external reality while the introvert relies on his internal interpretation of those objects. Behaviorally, extroverts appear to be more outgoing and actively engaged in their environment, while introverts are more likely to appear detached and aloof from their surroundings.

In addition, Jung theorized that an individual further orients himself to the environment by means of four basic functions: sensing, intuition, thinking, and feeling. Jung argued that the first two functions, sensing and intuition, represented opposite modes of perceiving reality. The intuitive function mediates perception
through the unconscious by focusing on the abstract, ideational meaning of sense data. Diametrically opposite, the sensing function conditions perception in such a way as to apprehend the concrete, detailed reality of objects. Like the preference for introversion or extroversion, most individuals develop a decided inclination toward either sensing or intuition as a mode of perceiving. In general, sensing types perceive reality "as it is", while intuitive types perceive reality "as it might be". Whereas a preference for one of these two functions tends to influence the way an individual perceives his environment, the latter two functions, thinking and feeling, determine the type of judgment a person makes about the validity of what he perceives. In general, the thinking function predisposes one to make decisions concerning the truth or falsity of what is perceived. In this way, it operates as an impersonal, logical process which serves to connect ideational concepts into a coherent system. The feeling function, on the other hand, conditions decisions about information in a more subjective, evaluational manner. As such, this function conditions judgments based more on axiological grounds than strict epistemological grounds. Where thinking types tend to make decisions based on their judgment of the truth or falsity of a proposition, feeling types prefer to make judgments based upon questions of value and worth.

Jung claimed that most well-functioning individuals develop a preference for one of the two orientations subsumed under each of the three aforementioned major psychological categories, i.e.,
attitude of consciousness (extroversion or introversion), mode of perception (sensing or intuition), and mode of judgment (thinking or feeling). Jung argued that the resulting eight personality types, constituted eight very different approaches to perceiving and making judgments about the world. Indeed, Jung argued that much of what appears to be random behavior becomes comprehensible when viewed with an understanding of the way these different types derive and process information emanating from their environment.

Mitroff and Kilmann propose a typology which classifies social science inquirers according to two of the Jungian constructs: the way in which one perceives the world (sensing or intuition) and the way in which one makes judgments regarding that which is perceived (thinking or feeling). In the Mitroff-Kilmann typology, these two pair of functions interact to produce four types of psychological orientation to the world: sensing-thinking (ST), intuitive-thinking (NT), sensing-feeling (SF), and intuitive-feeling (NF). Like Kaplan's cognitive styles, each of the four resultant psychological types represents a distinct way of consciously interacting with the world. In the authors' view, these four psychological orientations underlie four quite different approaches to social science inquiry.

Mitroff and Kilmann delineate their thesis by hypothesizing that sensing-thinking types would be attracted to inductive, nomothetic approaches to inquiry because, like the ST type, these approaches place a high premium on objectivity, certainty, consensus, precision, and reliability. Quite similar to Kaplan's _eristic_ investigator,
the sensing-thinking type views the world in ways that are likely to be congruent to the methodological world view which underlies Hultsch and Hickey's mechanistic model of inquiry, viz., the traditional experimental-quantitative style of inquiry. At the other end of the methodological spectrum, Mitroff and Kilmann contended that sensing-feeling types are likely to be attracted to idiographic methodologies because these approaches reflect the SF type's fundamental orientation toward experiences which focus on the concrete and emotional reality of each human being. Here the goal of inquiry, though still concrete, is not directed toward the inductive establishment of "law-like" generalizations, but, rather, is aimed at attaining a deeper understanding of what makes each individual truly unique. Thus, it seems likely that this type would have much in common with Kaplan's literary inquirer. Mitroff and Kilmann argued that both the ST and the SF researchers, while opposite in the judgmental dimension, i.e., impersonal (T) versus personal (F) analysis, both direct their attention to concrete, external realities as the initial basis from which knowledge may be derived. That is, they are both "sensing" methodologies oriented to understandings which inductively emerge from the analysis of particulars.

In contrast, the two "intuitive" research types, the NT and the NF, begin investigation from a more conceptual, theoretical position. That is, while "facts" are also viewed as vital to research, the fundamental psychological world-view of these investigators predispose them, at the outset, to elaborate abstract models of either explanation (NT) or utility (NF). Mitroff and Kilmann argued that while
both NT and NF researchers express the dominance of their intuitive mode of perception through an inclination to erect theoretical models, the goal of their inquiry is modified by the nature of their judgmental function. That is, while both types approach inquiry with a tendency to understand their substantive domain through conceptual paradigms, the ultimate goal of their inquiry is different, viz., the NT investigator views the purpose of his models as the establishment of factual explanation (T), while the NF inquirer conceives of his theoretical framework as instrumental to enhancing the welfare of people (P). That is, while both investigators approach inquiry from an intuitive perspective, the purpose of the process differs depending upon whether their judgmental function is primarily thinking or feeling. As discussed earlier, this process is similar to that of the "sensing" researchers. In a sense, the intuitive inquirer tends to take a more deductive approach to inquiry, while the sensing investigator relies primarily upon more empirical, inductive approaches to knowledge creation.

Mitroff and Kilmann pointed out that each style of inquiry has both its advantages and disadvantages as a methodological strategy. That is, like the Jungian personality types themselves, there is not one style of inquiry which reflects a superior view of the world. Rather, each style of inquiry has embedded within it not only a set of assumptions about reality but also a set of observational and methodological categories deemed useful for investigating it. It is important to note further that, in the authors' view, each of the four psychological types is attracted to their respective methodological perspective not primarily on "logical" grounds, but because of
a psychological affinity toward the world-view which that perspective expresses.

Mitroff and Kilmann maintained that their Jungian-based research typology provides one way of analyzing and explaining the acrimony that often surrounds methodological debates in the social sciences. That is, the authors suggest that predictable conflict will exist among proponents of these four diverse styles of inquiry. Mitroff and Kilmann predict, for example, that an ST researcher will have a great deal of trouble appreciating the value of research advocated by an NF investigator, and vice versa. This is because, in Jungian theory, these two psychological types represent opposite positions on both the perception and judgment functions. The same can be said of the NT-SF relationship. Mitroff and Kilmann also predicted that advocates of the two "feeling" styles of inquiry (SF and NF) will tend to denigrate the merit of the two "thinking" methodologies (NT and ST). The authors' explanation for this conflict is that thinking and feeling represent oppositional poles on the Jungian judgment function. Similar reasoning can be applied to the hypothesized conflict between the "sensing" and "intuitive" methodologies. Again, it is important to realize that the authors are arguing that this "failure to communicate" stems not from disagreements over technical procedures, but, rather, from differences inherent in the way different types of researchers psychologically orient themselves and their inquiry to the world. Clearly, Mitroff and Kilmann's bold speculation has the potential of generating promising research
directed toward increasing our ability to understand and explain
the nature of methodological diversity in the social sciences. The
authors summarized this intent by asking,

Is science largely the creation and dominance of a
particular psychological type of style, the projec-
tion of a particular psyche onto the world? And if
so, are alternate forms of science possible? We
believe the answer to the preceding questions is
"yes" (p. 4).

There are several ways that research might test the validity of
the Mitroff and Kilmann thesis. An explicit approach might, for
example, investigate the relationship between psychological type and
preference for a clearly articulated system of methodological concepts
emanating from each of the four Mitroff and Kilmann Jungian-based
styles of inquiry. That is, research might examine the interaction
between psychological type and adherence to specific world-views
expressed through the presentation of explicit methodological
positions. If one had the opportunity to become familiar with the
logic and goals of a variety of approaches to inquiry, this strategy
might have considerable merit. It is, however, well understood that
various external constraints operate to narrow the range of method-
ological awareness and selection. The influence of, for example,
disciplinary research tradition, funding agency requirements,
academic publication policies, and, perhaps most fundamental of all,
graduate research training all serve to limit the ability to learn
and understand different approaches to inquiry.

Indeed, most fields of social and human inquiry train investi-
gators in what Mitroff and Kilmann have termed the sensing-thinking
style of inquiry, i.e., experimental design and quantitative analysis. An examination, for example, of most psychological, sociological, economic, and political science research journals suggests that, indeed, this one methodological perspective dominates most inquiry in these social sciences. That is, researchers in these disciplines appear to form a relatively homogeneous group in terms of research training and focus. As such, the concept of four diverse styles of inquiry would very likely have little meaning and relevance. Indeed, Mitroff and Kilmann failed to explicitly address the relationship between their research typology and the forms of inquiry actually conducted within specific disciplines.

Thus, a more fertile matrix from which to test the Mitroff and Kilmann thesis might be in substantive arenas less tightly bound by one single methodological perspective. One such area is education. As an applied field of study, the academic discipline of education is the creation of both scholarly and professional knowledge. Indeed, educational inquiry has in the past and continues to be subject to the "creative tension" which exists between the academic demands of the other social sciences and the pragmatic necessities emanating from the community of educational practice (Bershimer and Iannaccone, 1973). An examination, however, of most academic educational research reveals a methodological focus quite similar to that found in the other social sciences. One major reason for this similarity is the nature of the formal research training experience in graduate departments of education. Wilson (1980), for example, after perusing 18 educational research texts, found an overwhelming emphasis on the techniques associated with this "natural science" model of inquiry.
Indeed, Wilson found only one text which dealt with the methods used by advocates of "qualitative" research approaches. Clearly, the concept of "doing research" in education, like most other substantive domains of human inquiry, has come to be equated with empirical methods which reflect Mitroff and Kilmann's sensing-thinking style of inquiry.

Although educational inquiry has a methodological focus similar to that found in the other social sciences, there is a significant difference in the nature of the professional literature within this applied field of study and that found within other domains of human inquiry. For, ironically, while formal graduate research training experience in education is limited essentially to one methodological perspective, an examination of the published literature in this field of study reveals a surprising diversity of approaches used to investigate educational problems. Indeed, the editors of the Review of Educational Research devoted the entire December, 1969 issue to a presentation of the many styles of inquiry that contribute to educational knowledge. Thus, while awareness of explicit methodological perspectives may be very limited in education due to the nature of graduate training, the diverse nature of inquiry which informs the discipline's sprawling literature suggests this applied-professional field of study as an excellent substantive matrix from which to test the Mitroff and Kilmann thesis. That is, it may be possible to examine methodological preference for different types of educational articles each of which implicitly reflects a particular style of inquiry. From this perspective, a style of inquiry is not presented in
terms of explicitly articulated canons of procedure, but, rather, is woven into the whole fabric of a scholarly discussion. As such, the methodological "weltanschauung" operates covertly as an assumption which informs both the nature and direction of the discourse.

One advantage of taking this approach is that the broader, and perhaps more significant, question of how knowledge is interpreted may also be addressed. Thus far, the relationship between personality and methodological preference has been discussed apart from any mention of the product of that relationship: the creation of knowledge itself. By weaving a methodological perspective into the context of a scholarly article, a more fundamental question may then be posed, viz., Does psychological type play a significant role not only in influencing one's attitude toward a particular methodological world view, but also in influencing one's attitude toward the type of knowledge emanating from that world view?

If the answer to the above question is yes, then the problem of knowledge diffusion becomes even more complex. That is, at the level of information dissemination, the major issue is no longer solely one of how to clearly transmit knowledge, but one of how to better understand the effect of psychological factors on the way in which different types of knowledge are perceived. For, indeed, just as a methodological system is much more than a loose aggregation of assorted techniques, so also is the knowledge derived from that system much more than an impersonal collection of objective facts. Mitroff and Mitroff (1979) reinforced this contention by asserting that, in fact, judgments concerning both the form and substance of knowledge are greatly influenced
by psychological factors. In this same regard, Scheffler (1965) has argued that,

Attributions of knowledge are not, in typical cases, simply descriptions of bodies of lore or types of experience. They express our standards, ideals, and tastes as to the scope and proper conduct of the cognitive arts. They reflect, for example, our conceptions of truth and evidence, our estimates of the possibilities of secure belief, our preferences among alternative strategies of investigation. (Italics, mine) (p. 2).

Carl Jung (1959) touched upon this last condition and indeed set the tone for the subsequent investigation by stating that,

In all fields of knowledge, psychological premises exist which exert a decisive influence upon choice of material, the method of investigation, the nature of the conclusions, and the formulations of hypotheses and theories.

In the spirit of a pretheoretical, exploratory investigation, this study addressed the following question:

Do Jungian psychological types significantly differ in their preference for published articles which reflect distinctly different ways of conceptualizing and investigating a substantive problem?
METHODOLOGY

Sample

The sample for this study consisted of 131 graduate students enrolled in quantitative research methodology courses offered by the Faculty of Educational Foundations and Research, an academic department within the College of Education at The Ohio State University. The sample was stratified into two categories: students enrolled in the two introductory research courses (ED:F&R 785 and 786) and students enrolled in three advanced quantitative methodology courses (ED:F&R 808, 809, and 925K51).

The selection of graduate students in education as the population of interest was based on the assumption that the influence of personality on methodological and epistemological preference would be less confounded in a group of people who, though involved in research training, were nonetheless still in the process of formulating their investigative orientations. The decision to sample all levels of methodological awareness was engendered by the further assumption that increased training in this one style of inquiry would tend to negate the effect of personality on preference for a diversity of inquiry styles. In addition, the selection of research methodology courses as the sampling frame presented the opportunity of investigating students majoring in many diverse educational sub-specialties. These courses attract both new and advanced graduate students who represent
a wide variety of academic concentrations within the College. As such, this sample reflected the diversity of emerging educational professionals who, by virtue of their graduate status, were not only actively aware of, but were required to consume, a body of educational literature informed by a variety of methodological perspectives.

**Stimulus Condition**

Participants in the study were asked to read four articles drawn from the educational literature. Each of the four articles was selected as an exemplar of one of the four styles of inquiry presented by Mitroff and Kilmann (1978), viz., intuitive-thinking (NT), intuitive-feeling (NF), sensing-feeling (SF), and sensing-thinking (ST). All four articles addressed the topic of faculty development, though from four very different methodological perspectives. The single topic of faculty development was selected not only to control for the effect of subject matter, but also to provide the participants with a topic that had a putatively broad appeal.

The four articles were selected from an initial sample of candidate articles drawn from the literature by this investigator. The selection of the four articles actually used in the study was based upon the ratings of both this investigator and his major adviser. The sole rating criterion was degree of correspondence between an author's manner of conceptualizing and investigating the topic and one of the four Mitroff and Kilmann Jungian-based styles of inquiry. The results of these ratings revealed a 100% agreement between the two ratings on each of the four articles. Below is a brief description of the four articles selected for the study.
NT Article


This article approached the subject of faculty development from a theoretical perspective. The author used a developmental stage model in an attempt to provide a conceptual framework useful in explicating the predictable stages of professional growth. Though some empirical data is used to support the model, the focus of this relatively abstract article is clearly on the construction of a valid theoretical perspective.

NF Article


Like the NT article, this article addressed the issue of faculty development from an intuitive point of view. Several models of faculty development were presented and discussed. Unlike the NT article, however, the author of the NF article sought not to establish a valid theory, but rather, to implement a conceptual model capable of directly facilitating the professional growth of a specified faculty. In this regard, the author's intent was to use theory to serve a clearly defined client system.

SF Article


Like the SF personality type, this article addressed faculty development in a very personal, concrete, and affective manner. A
powerful, emotional tone pervaded the article as the author described the painful experiences which led to his development as a faculty member. Unlike the two intuitive articles, the focus was not on conceptualizing the developmental process, but on individuating it.

**ST Article**


Similar to the SF perspective, this article took a molecular approach to the topic of faculty development. The focus, however, was not on one individual's subjective response to the problem of professional growth but, rather, was specifically oriented to the impersonal collection of precisely measured, objective data. This article, replete with its charts and graphs, was an exemplar of the traditional experimental-quantitative research paradigm. Like the NT article, the goal was truth. Unlike the NT article, however, the process for obtaining it was inductive rather than deductive.

**Instrumentation**

**Independent Variables**

The Myers-Briggs Type Indicator (MBTI) (Myers, 1962) was used to categorize each subject into one of the four Mitroff and Kilmann research types. The MBTI, form G, is a 126 item, forced-choice, self-administering questionnaire which purports to psychometrically represent Carl Jung's personality typology. The instrument was first published in 1962 after 20 years of technical development. The Indicator has been used widely both as a clinical and a research tool.
Indeed, the Center for Applications of Psychological Type (CAPT) has recently published a bibliography of 593 research studies which used the MBTI (CAPT, 1980).

The MBTI produces two types of scores. The most commonly used score is a four factor psychological type classification based on a person's preference for Extroversion (E) or Introversion (I), Sensing (S) or Intuition (N), Thinking (T) or Feeling (F), and Judging (J) or Perceiving (P). This last dimension (J-P) was not directly addressed in Jungian theory, but was included in the Indicator to represent the dominance of either the judging (T-F) or the perceiving (S-N) function in a person's orientation to the world. These four classifications combine to produce 16 distinct personality types, e.g., INTP, ESTJ, INFJ, etc. The second type of score produced by the MBTI is a continuous measure of an individual's position on each of the four bipolar functions. That is, this score indicates both the nature and strength of preference on each continuously measured function. The Mitroff and Kilmann research typology was derived solely from the judging (T-F) and perceiving (S-N) preferences.

The psychometric properties of the MBTI have been extensively reviewed and suggest that the instrument is useful for research purposes (Mendelsohn, 1965; Sundberg, 1965). There is empirical evidence that while the E-I, S-N, and T-F dimensions are independent, the J-P and the S-N functions are substantially related (Carlyn, 1977; Coan, 1978). Both test-retest and internal consistency reliability estimates of the MBTI tend to be in the .75-.85 range
(Carskaden, 1977; Myers, 1962; Siegel, 1963). The consistently lowest reliability estimate is typically found on the T-F function (Myers, 1962) and, in general, the reliabilities of the continuous type scores tend to be higher than those of the categorical type classification (Carlyn, 1977).

The question of the Indicator's validity is, like most personality instruments, a vexing one. In the most comprehensive technical review of the MBTI, Carlyn (1977) reported that the instrument exhibited moderate predictive validity in forecasting college major and academic achievement. In addition, the MBTI was found to be significantly related to the Gray-Wheelwright Questionnaire (Gray and Wheelwright, 1946), an instrument developed by Jungian analysts to measure the same properties as the MBTI. The reliability of the MBTI was, however, found to be somewhat higher (Myers, 1962). As expected, the question of the MBTI's construct validity is controversial. While some authors sharply criticize the instrument's claim that it indicates the Jungian psychological typology (Mendelsohn, 1965; Stricker and Ross, 1964a, 1964b), other reviewers assert that the MBTI does, in fact, provide an adequate representation of Jung's theoretical system (Carlyn, 1977; Carskaden and Knudson, 1978; Coan, 1978; Steele and Kelly, 1976). In sum, the MBTI appears to be an acceptable empirical indicator of psychological type differences among late adolescents and adults.

In addition to the MBTI, a brief 16-item questionnaire (Informational Survey) was used in this study both to describe the
characteristics of the sample and to control for the effect of non-
psychological variables on article preference.

**Dependent Variables**

Three response measures were used in this study. Two of these
measures (Response Measure One and Two) required the participant
to respond to questions concerning each article. The third (Overall
Response Measure) was designed to elicit preferences regarding the
value of all four articles.

Response Measure One was a semantic differential designed to
measure the meanings associated with each article. The semantic
differential is a widely used research instrument which permits the
investigator to quantify both the nature and strength of meanings
associated with a concept (Osgood, Suci, and Tannebaum, 1957).
The semantic differential created for this study consisted of 26
scales. Each scale was defined by a pair of bipolar adjectives.
The nature and strength of preference was measured on a seven point
scale. The first seventeen scales on Response Measure One were
selected from a factor analytic study performed by Osgood, et al.,
in *The Measurement of Meaning* (1957). The remaining nine scales
were created by this investigator.

Response Measure Two was designed to elicit a variety of
judgments regarding the nature and value of each of the four
articles. This instrument contained six questions which provided
the participant with the opportunity to write a detailed evaluation
of each article. This evaluation included his or her perception of
the type of person who wrote the article.
Response Measure Three (Overall Response Measure) was created to allow the participant the opportunity to express his or her judgment about and preference for all four articles. This measure consisted of 13 questions. The first four questions, especially numbers 1 and 3, constituted the principal dependent variables of the study. Specifically, questions 1 and 2 asked the subject to select the articles which he or she judged to have, respectively, the greatest and least potential of making a contribution to education. Questions 3 and 4 asked the participant to select the articles which were, methodologically, most and least personally appealing. Subsequent to these crucial questions, the participant was asked to select the articles which they judged to be most and least scientific, easiest and hardest to read, most alike, least alike, etc. The final question asked the participant to select the author he or she found most appealing.

Procedure

Subject participation in this study was elicited in eight introductory and advanced research methodology classes during the 1980-81 academic year. Upon receipt of instructor approval, this investigator entered each class at the beginning of the quarter and solicited student participation. The students were informed as to the broad nature of the study and apprised of its voluntary nature. Each student who volunteered to participate was given a packet which contained all the materials necessary to complete the project (Appendix A). Each packet contained the following materials:
1) A letter which briefly reiterated the nature and purpose of the study and thanked the participant for his or her involvement.

2) An outline of suggestions which stressed the need to focus on the article's process rather than its product.

3) A human subjects research consent form.

4) The Informational Survey.

5) Photocopies of the four articles (sans author identification). Response Measures One and Two were attached to each article.

6) The Overall Response Measure.

7) A copy of the MBTI test booklet and answer sheet.

The students were instructed to first complete the Informational Survey, and then read and respond to each of the four articles. Subsequent to this activity, the subjects were asked to respond to the Overall Response Measure. As their final task, subjects were asked to complete the MBTI. The subjects were permitted to take the materials home and complete the project in whatever way they found most conducive to their preferred manner of reading research articles. Subjects were required to return the packets to class in three to four weeks. This terminated their participation in the study.

Analysis

A variety of statistical procedures were used to analyze the resultant data. A chi-squared contingency table analysis was
performed to test the relationship between the students' Mitroff and Kilmann research type and their preference for the most valuable and most appealing article. A log-linear analysis was also performed on these data in an attempt to determine whether additional non-personality variables either affected or interacted with personality to influence article preference. A linear discriminant analysis was performed on each of the four semantic differentials. The grouping variable was the four level Mitroff and Kilmann research typology. This procedure was employed in an attempt to differentiate among the four types with regard to the pattern of meanings associated with each article. A factor analysis was performed on the four semantic differentials in order to determine the existence of an underlying factorial structure.

In addition to these quantitative procedures, the written evaluations of the four articles were examined to qualitatively assess the relationship between psychological type and the nature of responses to the four styles of inquiry.
RESULTS

Description of the Sample

The sample consisted of 32 men and 97 women*. Fifty-three of the respondents indicated that they were doctoral students while 76 were currently enrolled in a master's degree program. Ninety-eight students were enrolled in the two introductory level research methodology courses; thirty-three students were taking advanced quantitative research courses. Not surprisingly, doctoral students comprised 94% of the advanced courses and 24% of the introductory courses.

Sixty percent of the sample received baccalaureate degrees in applied-professional fields such as education and home economics; the remainder of the sample held bachelor degrees in the humanities (19%), the social sciences (15%) and the physical sciences (6%). Sixty-eight percent of the females held an undergraduate degree in one of the applied-professional areas, while only 28% of the males indicated a degree in one of these fields of study. Over 90% of the sample were currently pursuing a graduate degree in some educational speciality, e.g., elementary education, student personnel work, counseling and guidance, etc.

*There was incomplete information on this and several other variables. The total number of subjects was 131.
In terms of personality type, all 16 possible four function MBTI Jungian types were represented in the sample. The ISTJ type was, overall, the most common (13%) followed closely by the ENFP (11%) and the ENTJ type (11%). The least prevalent types were the ISFP (1%), ENTP (1%), ESFP (1%), and the ESTP (2%). Females tended to be ENFP's (15%) and ISTJ's (13%) while males were most frequently ISTJ (19%) and ESTJ (16%).

Collapsing these four function Jungian types into the four two-factor Mitroff-Kilmann research orientations revealed that there were 32 Intuitive-Thinking (NT) types, 39 Intuitive-Feeling (NF) types, 25 Sensing-Feeling (SF) types, and 34 Sensing-Thinking (ST) types. Table 1 indicates that there was a statistically significant relationship between sex and Mitroff-Kilmann psychological type, \( \chi^2 \) = 9.67, \( p < .03 \). Table 1 also indicates that while females tended to be evenly divided among the four research orientations, almost half of the males were classified as ST psychological types.

Table 2 indicates that the Intuitive-Feeling article was judged, overall, as the article which made the greatest contribution to educational knowledge, while the Sensing-Feeling article was judged, overall, as the methodologically most appealing article. In addition, the Sensing-Thinking article was overwhelmingly perceived as the most scientific of the articles, while the Sensing-Feeling article was judged to be the least scientific. The clear distinction between these two articles was also present in readability. The Sensing-Feeling article was considered the easiest to read while the Sensing-Thinking article was described as the hardest. Almost half of the sample indicated that the author of the Sensing-Feeling article was
### TABLE 1
Cross Classification of Sex by Mitroff-Kilmann Research Type

<table>
<thead>
<tr>
<th>Sex</th>
<th>Research Type</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NT</td>
<td>NF</td>
<td>SF</td>
<td>ST</td>
<td>Marginals</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>7</td>
<td>7</td>
<td>3</td>
<td>15</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>25</td>
<td>31</td>
<td>21</td>
<td>19</td>
<td>96</td>
<td></td>
</tr>
<tr>
<td>Marginals</td>
<td>32</td>
<td>38</td>
<td>24</td>
<td>24</td>
<td>128</td>
<td></td>
</tr>
</tbody>
</table>

### TABLE 2
Cross Classification of Article Type by Selected Questions From the Overall Response Measure

<table>
<thead>
<tr>
<th>Article Type</th>
<th>Question</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Intuitive-Thinking</td>
<td>19</td>
<td>17</td>
<td>6</td>
<td>5</td>
<td>14</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>Intuitive-Feeling</td>
<td>50</td>
<td>39</td>
<td>8</td>
<td>8</td>
<td>17</td>
<td>18</td>
<td>29</td>
</tr>
<tr>
<td>Sensing-Feeling</td>
<td>16</td>
<td>46</td>
<td>1</td>
<td>110</td>
<td>90</td>
<td>4</td>
<td>59</td>
</tr>
<tr>
<td>Sensing-Thinking</td>
<td>40</td>
<td>24</td>
<td>112</td>
<td>2</td>
<td>7</td>
<td>88</td>
<td>18</td>
</tr>
</tbody>
</table>
the most appealing to them, followed by the author of the other "Feeling" article.

Analysis of the Data

The results of the preliminary analyses contained in Table 3 confirmed the major hypothesis that a significant relationship existed between psychological type, i.e., Mitroff-Kilmann research orientation, and selection of the article judged to have the greatest potential of contributing to educational understanding (Question 1, Overall Response Measure), $X^2_{(9)} = 18.71, \rho < .03$. An examination of Table 3 indicates a strong relationship between the article selected as substantively most important and the Jungian-based Mitroff-Kilmann research topology. As predicted, the Intuitive-Thinking, the Intuitive-Feeling, and the Sensing-Thinking articles were judged most important by their respective research types to a significantly greater degree than the other three types. Response to the Sensing-Feeling article, however, was evenly divided among all four research types. This initial result suggests that psychological orientation does exert an influence on judgments concerning the significance of knowledge derived from diverse epistemological perspectives. This finding was, however, subjected to a further series of analyses designed to control the effect of sex, level of research knowledge, and graduate status on epistemological preference.

Log-linear analysis (LLA) was the statistical procedure used to control for the effects of these three variables on the selection of the article judged to have the greatest potential of contributing to educational understanding. This recently developed statistical system
TABLE 3
Cross Classification of Mitroff-Kilmann Research Orientation by Article Judged to Have the Greatest Potential of Making a Contribution to Education

<table>
<thead>
<tr>
<th>Research Type</th>
<th>Article Type</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Marginals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intuitive-Thinking</td>
<td>Sensing-Thinking</td>
<td>Sensing-Feeling</td>
<td>Intuitive-Feeling</td>
<td>Intuitive-Thinking</td>
<td></td>
</tr>
<tr>
<td>NT</td>
<td>10</td>
<td>5</td>
<td>7</td>
<td>9</td>
<td></td>
<td>31</td>
</tr>
<tr>
<td>NF</td>
<td>4</td>
<td>3</td>
<td>9</td>
<td>21</td>
<td></td>
<td>37</td>
</tr>
<tr>
<td>SF</td>
<td>2</td>
<td>4</td>
<td>7</td>
<td>11</td>
<td></td>
<td>24</td>
</tr>
<tr>
<td>ST</td>
<td>3</td>
<td>4</td>
<td>16</td>
<td>9</td>
<td></td>
<td>32</td>
</tr>
<tr>
<td>Marginals</td>
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<td>16</td>
<td>39</td>
<td>50</td>
<td></td>
<td>124</td>
</tr>
</tbody>
</table>
system represents a major breakthrough in the analysis of discretely measured variables. Whereas chi-square is an adequate procedure when the relationship or difference between two nominal level variables is of interest, it is unable to perform a simultaneous analysis of the relationship or difference among three or more nominal variables. The essence of the procedure is the construction of several statistical models derived from various combinations of the variables at hand. In this sense, LLA is quite similar to the model testing aspects of more well-known parametric procedures such as regression analysis and the analysis of variance. From an examination of these competing models, the investigator selects the model which not only best fits the observed data, but is most parsimonious in explanatory parameters (see Appendix B for an explanation of the model selection procedure employed in this study). The test of significance in LLA is typically the maximum likelihood Chi-square statistic. The smaller the value of this statistic relative to degrees of freedom, the better the model fit. Although LLA is appropriate when analyzing relationships among variables, this study employed the procedure to test for significant differences in article preference among psychological type classifications and three control variables: sex (male or female), graduate status (master's student or doctoral student), and level of research knowledge (introductory course vs. advanced course membership). In this context, article preference was considered the dependent, or response variable, while psychological type and one of the three control variables were considered as independent, or explanatory, variables. This variation of LLA is known as logit analysis (for more information on this emerging, non-parametric technique, see Fienberg (1979), Kennedy (1981), and Knoke and Burke (1980)).
Four separate log-linear analyses were performed on respondent preference for the article perceived as most important to educational understanding. The first analysis used the procedure outlined in Appendix B to examine the effect of psychological type and sex on article preference. The best fitting model was found to be the one which only contained the effect of psychological type $X^2_{(12)} = 8.90, \rho < .71$. Thus, after examining the influence of sex, psychological type was found to have a significant influence on article preference. Table 4 indicates that, similar to the chi-square results, the NT, NF, and ST respondents selected their predicted article to a significantly greater degree than the other three, $Z \geq 1.96, \rho < .025$. The coefficients presented in Table 4 represent the magnitude of the four psychological type effects on article preference. Table 4 also indicates that there were significantly more ST males than females, $Z \geq 2.58, \rho < .005$.

The same analysis was performed substituting graduate status in place of sex as the control variable. Again, the model containing only the psychological effect best accounted for article preference, $X^2_{(12)} = 11.76, \rho > .46$. Table 5 reveals that the same significant pattern of predicted article selection was observed for the NT, NF, and ST types, $Z \geq 1.96, \rho < .025$. Table 5 also indicates that there were significantly more SFs at the master's level than at the doctoral level, $Z \geq 1.65, \rho < .05$. Interestingly, the other "feeling" orientation, the NF type, tended to be found at the doctoral rather than the master's level.

The final three-way analysis included level of research knowledge as the control variable. Like the two prior analyses, the results
TABLE 4
Parameter Estimates* of the Differential Effects of Psychological Type on Epistemological Preference

<table>
<thead>
<tr>
<th>Type</th>
<th>Intuitive-Thinking</th>
<th>Intuitive-Feeling</th>
<th>Sensing-Feeling</th>
<th>Sensing-Thinking</th>
<th>Sex</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>NT</td>
<td>2.34</td>
<td>-1.54</td>
<td>.19</td>
<td>-1.21</td>
<td>-51</td>
<td>.51</td>
<td></td>
</tr>
<tr>
<td>NF</td>
<td>.24</td>
<td>2.15</td>
<td>-.81</td>
<td>-.49</td>
<td>-.59</td>
<td>.59</td>
<td></td>
</tr>
<tr>
<td>SF</td>
<td>-.79</td>
<td>.64</td>
<td>.71</td>
<td>-.33</td>
<td>-1.09</td>
<td>1.09</td>
<td></td>
</tr>
<tr>
<td>ST</td>
<td>-.76</td>
<td>-1.06</td>
<td>-.05</td>
<td>2.28</td>
<td>2.61</td>
<td>-2.61</td>
<td></td>
</tr>
</tbody>
</table>

*Parameter estimates are approximately distributed as unit normal variates and tend to be negatively biased.

TABLE 5
Parameter Estimates of the Differential Effects of Psychological Type on Epistemological Preference

<table>
<thead>
<tr>
<th>Type</th>
<th>Intuitive-Thinking</th>
<th>Intuitive-Feeling</th>
<th>Sensing-Feeling</th>
<th>Sensing-Thinking</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT</td>
<td>2.34</td>
<td>-1.54</td>
<td>.19</td>
<td>-1.21</td>
<td>1.03</td>
</tr>
<tr>
<td>NF</td>
<td>-.24</td>
<td>2.15</td>
<td>-.81</td>
<td>-.49</td>
<td>1.61</td>
</tr>
<tr>
<td>SF</td>
<td>-.79</td>
<td>.64</td>
<td>.71</td>
<td>-.33</td>
<td>-1.91</td>
</tr>
<tr>
<td>ST</td>
<td>-.76</td>
<td>-1.06</td>
<td>-.05</td>
<td>2.28</td>
<td>-.29</td>
</tr>
</tbody>
</table>
indicated that, after controlling for this variable, the model again containing only psychological type best accounted for the observed article selection pattern, \( \chi^2_{(12)} = 12.57, p > .40 \). Table 6 indicates that the response structure was the same, viz., NT, NF, and ST psychological types selected their predicted articles significantly more often than the other three. Table 6 also reveals that there was no significant relationship between psychological type and level of research knowledge, although SF's tended to be found in introductory courses while NF's tended to be enrolled in the advanced courses. This finding is not surprising given the earlier result which revealed that advanced courses were almost entirely comprised of doctoral students.

The last log-linear analysis examined the simultaneous effect of psychological type, sex, and graduate status on preference for the article contributing most to educational understanding. The results of this much more complex analysis (over 100 possible models) indicated that models containing 1) psychological type only, 2) psychological type and sex, and 3) psychological type, sex, and graduate status all provided an excellent fit, i.e., \( p \) values were all .76. Examination of the marginal and partial association coefficients, however, indicated that psychological type exerted the strongest effect on article preference. (See Table B and C in Appendix B for a presentation of the partial and marginal coefficients associated with all model effects examined in this study.) This evidence combined with the prior results and the goal of model parsimony led to the selection of the psychological type only model as the model of best fit. The reader is advised, however, that this finding may be subject to debate. Given this caveat and the understanding that interpreting simple as well as complex log-linear models...
### TABLE 6
Parameter Estimates of the Differential Effects of Psychological Type on Epistemological Preference

<table>
<thead>
<tr>
<th>Type</th>
<th>Intuitive-Thinking</th>
<th>Intuitive-Feeling</th>
<th>Sensing-Feeling</th>
<th>Sensing-Thinking</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT</td>
<td>2.40</td>
<td>-1.48</td>
<td>.24</td>
<td>-1.39</td>
<td>Intro</td>
</tr>
<tr>
<td>NF</td>
<td>-.27</td>
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<td>-.84</td>
<td>-.37</td>
<td>-1.19</td>
</tr>
<tr>
<td>SF</td>
<td>-.85</td>
<td>.57</td>
<td>.65</td>
<td>-.14</td>
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</tr>
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<td>ST</td>
<td>-.72</td>
<td>-1.00</td>
<td>.00</td>
<td>2.11</td>
<td>.67</td>
</tr>
</tbody>
</table>

### TABLE 7
Parameter Estimates of the Differential Effects of Psychological Type on Epistemological Preference

<table>
<thead>
<tr>
<th>Type</th>
<th>Intuitive-Thinking</th>
<th>Intuitive-Feeling</th>
<th>Sensing-Feeling</th>
<th>Sensing-Thinking</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT</td>
<td>2.21</td>
<td>-1.44</td>
<td>.19</td>
<td>-1.12</td>
</tr>
<tr>
<td>NF</td>
<td>-.30</td>
<td>2.14</td>
<td>-.77</td>
<td>-.51</td>
</tr>
<tr>
<td>SF</td>
<td>-.71</td>
<td>.57</td>
<td>.67</td>
<td>-.36</td>
</tr>
<tr>
<td>ST</td>
<td>-.75</td>
<td>-1.05</td>
<td>-.06</td>
<td>2.23</td>
</tr>
</tbody>
</table>

**Note:** The parameter estimates associated with sex and graduate status were essentially the same as the prior analyses.
is as much "art" as science, the results of this model selection procedure, described in Table 7, indicated that the same pattern of results revealed by the prior analyses were also found in this more complex analysis, viz., NT, NF, and ST psychological types selected their predicted article to a significantly greater degree than the other three, \( Z > 1.96, \rho < .025 \).

In an attempt to examine the effect of psychological type on methodological preference, per se, another bivariate chi-square analysis was performed between psychological type and response to question 3 of the Overall Response Measure. Table 8 indicates a pattern of response remarkably similar to that of the prior analyses. That is, a statistically significant relationship was found between psychological type and methodological preference, \( X^2(9) = 18.44, \rho < .03 \). With the similar exception of the Sensing-Feeling article, each article was preferred by their predicted type. This was especially true of the Intuitive-Thinking and Sensing-Thinking articles. However, the NF types were almost equally divided in their preference for the Intuitive-Feeling and Sensing-Feeling articles. These findings were also further subjected to a series of log-linear analyses designed to control for the effect of sex, graduate status, and level of research knowledge on selection of the methodologically most appealing article. Accounting for sex, the model selection procedure indicated that the model containing only the psychological type effect was clearly the model of best fit, \( X^2(12) = 9.02, \rho > .70 \). Table 9 indicates that the relationship between specific psychological types and methodological preference was, overall, less strong than preference for the article making the greatest contribution to knowledge. Nonetheless, NT's found the style of inquiry in their predicted article significantly
## TABLE 8

Cross Classification of Mitroff-Kilmann Research Orientation by Article Judged as Methodologically Most Appealing

<table>
<thead>
<tr>
<th>Research Type</th>
<th>Intuitive-Thinking</th>
<th>Intuitive-Feeling</th>
<th>Sensing-Feeling</th>
<th>Sensing-Thinking</th>
<th>Marginals</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT</td>
<td>8</td>
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<td>8</td>
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<td>NF</td>
<td>4</td>
<td>13</td>
<td>17</td>
<td>4</td>
<td>38</td>
</tr>
<tr>
<td>SF</td>
<td>2</td>
<td>11</td>
<td>9</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td>ST</td>
<td>3</td>
<td>5</td>
<td>11</td>
<td>12</td>
<td>31</td>
</tr>
<tr>
<td>Marginals</td>
<td>17</td>
<td>39</td>
<td>45</td>
<td>24</td>
<td>125</td>
</tr>
</tbody>
</table>

## TABLE 9

Parameter Estimates of the Differential Effects of Psychological Type on Methodological Preference

<table>
<thead>
<tr>
<th>Type</th>
<th>Intuitive-Thinking</th>
<th>Intuitive-Feeling</th>
<th>Sensing-Feeling</th>
<th>Sensing-Thinking</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT</td>
<td>1.84</td>
<td>-0.14</td>
<td>-1.33</td>
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</tr>
<tr>
<td>NF</td>
<td>-0.29</td>
<td>0.76</td>
<td>1.20</td>
<td>-1.15</td>
</tr>
<tr>
<td>SF</td>
<td>-0.59</td>
<td>1.57</td>
<td>0.07</td>
<td>-0.59</td>
</tr>
<tr>
<td>ST</td>
<td>-0.59</td>
<td>-1.93</td>
<td>0.17</td>
<td>2.73</td>
</tr>
</tbody>
</table>
more appealing than the other three, $Z \geq 1.65$, $p < .05$, especially the Sensing-Feeling article. The NF respondents, however, did not exhibit a significant preference for any particular methodological perspective, while the SF's approached, but did not quite attain, statistical significance in their preference for the change-oriented style of inquiry underlying the Intuitive-Feeling article. As predicted by Mitroff and Kilmann, ST respondents demonstrated a strong preference for the methodological approach of their predicted article, $Z \geq 2.58$, $p < .005$ and exhibited a significant lack of enthusiasm for the Intuitive-Feeling article's investigative perspective, $Z \leq -1.645$, $p < .05$.

The next analysis substituted graduate status for sex as the control variable. The results of this analysis indicated that the best fitting model included the independent effects of both psychological and graduate status on methodological preference. Table 10 indicates that psychological type was somewhat less predictive of the methodological appeal when graduate status was included in the model. NT types, however, still tended to prefer their predicted article. A similar result was obtained for the NF type in their general preference for the affective orientation of the Sensing-Feeling article. Interestingly, the SF respondents exhibited the same moderate preference for the Intuitive-Feeling article's methodological perspective. The ST type, however, strongly preferred their predicted style of inquiry, $Z \geq 1.96$, $p < .025$, and found the NF methodology significantly less appealing than the other three, $Z \leq -1.65$, $p < .05$. Examination of the graduate status effect revealed that doctoral students tended to prefer the traditional, quantitative approach of the Sensing-Thinking article significantly
<table>
<thead>
<tr>
<th>Type</th>
<th>Intuitive-Thinking</th>
<th>Intuitive-Feeling</th>
<th>Sensing-Feeling</th>
<th>Sensing-Thinking</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT</td>
<td>1.49</td>
<td>-.14</td>
<td>-1.33</td>
<td>-.51</td>
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<tr>
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<td>-.33</td>
<td>.76</td>
<td>1.20</td>
<td>-1.15</td>
</tr>
<tr>
<td>SF</td>
<td>-.38</td>
<td>1.57</td>
<td>.07</td>
<td>-.59</td>
</tr>
<tr>
<td>ST</td>
<td>-.59</td>
<td>-1.93</td>
<td>.17</td>
<td>2.73</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Status</th>
<th>Intuitive-Thinking</th>
<th>Intuitive-Feeling</th>
<th>Sensing-Feeling</th>
<th>Sensing-Thinking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctoral</td>
<td>.45</td>
<td>-.44</td>
<td>-1.83</td>
<td>1.30</td>
</tr>
<tr>
<td>Masters</td>
<td>-.45</td>
<td>.44</td>
<td>1.83</td>
<td>-1.30</td>
</tr>
</tbody>
</table>
more often than master's students. They were, however, significantly less impressed than the master's student with the personalistic, affective style of inquiry underlying the Sensing-Feeling article, \( Z < -1.65, \ p < .05 \).

The final three variable analysis included level of research knowledge as the control variable. Again, the best fitting model was the one containing only the effect of psychological type. Table 11 reveals that NT types significantly preferred their predicted style of inquiry, \( Z > 1.65, \ p < .05 \). NF's tended to prefer the Sensing-Feeling approach, though not to a statistically significant degree. They did not prefer the Sensing-Thinking perspective to roughly the same degree. SF types generally preferred the Intuitive-Feeling style of inquiry, though again, not to a statistically significant degree. True to form, the ST's strongly endorsed the methodological appeal of the Sensing-Thinking article, \( Z > 2.58, \ p < .005 \). They also were significantly less impressed with the Intuitive-Feeling approach, \( Z < -1.65, \ p < .05 \).

The final procedure consisted of analyzing the simultaneous effect of psychological type, sex, and graduate status on methodological preference. The model of best fit included the main effects for both psychological type and graduate status, \( \chi^2_{(36)} = 27.41, \ p < .85 \). The results of this analysis are almost identical to those found in Table 10.

The above two categories of analysis tend to both confirm and augment the major findings of the Chi-square analyses. That is, with the exception of the SF orientation, Mitroff and Kilmann's research personality typology was significantly related to preference for
TABLE 11

Parameter Estimates of the Differential Effects of Psychological Type on Epistemological Preference

<table>
<thead>
<tr>
<th>Type</th>
<th>Intuitive-Thinking</th>
<th>Intuitive-Feeling</th>
<th>Sensing-Feeling</th>
<th>Sensing-Thinking</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT</td>
<td>1.876</td>
<td>-.10</td>
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<tr>
<td>NF</td>
<td>-.31</td>
<td>.74</td>
<td>1.28</td>
<td>-1.17</td>
</tr>
<tr>
<td>SF</td>
<td>-.63</td>
<td>1.51</td>
<td>.26</td>
<td>-.64</td>
</tr>
<tr>
<td>ST</td>
<td>-.56</td>
<td>-1.89</td>
<td>.05</td>
<td>2.77</td>
</tr>
</tbody>
</table>
educational knowledge modalities. Methodological preference was, however, more complicated. The second series of log-linear analyses revealed that graduate status as well as psychological type was predictive of respondent preference for style of inquiry. Tables B and C in Appendix B, however, reveal that psychological type was less predictive of methodological preference when graduate status was included in the analysis. In both series of analyses, however, NTs and STs preferred their predicted article's epistemological, as well as methodological, perspective. Indeed, Table 12 indicates a highly significant relationship between overall epistemological and methodological preference, $X^2_{(9)} = 85.96, \, p < .00001$.

Table 12 indicates that, with the exception of the Sensing-Feeling article, the articles judged methodologically most appealing were also judged epistemologically most valid. That is, it appears that methodological predilections strongly influenced judgments regarding the value of subsequent knowledge.

While the above analyses suggest that there were differences among Mitroff-Kilmann research types with regard to the highly related concepts of epistemological and methodological preference, they did not provide information regarding the effect of psychological type on epistemological and methodological judgments about each of the four articles. That is, for example, while there is evidence that ST graduate students overwhelmingly preferred the Sensing-Thinking article, we do not know either the reasons for that preference or the nature of their attitudes toward the other three articles.

In an attempt to shed more light on this matter, a series of additional bivariate chi-square analyses examined the relationship between psychological type and response to questions 1 and 3 in each of
TABLE 12
The Relationship Between Articles Judged to be
Methodologically and Epistemologically Most Appealing

<table>
<thead>
<tr>
<th>Methodologically Most Appealing Article</th>
<th>Article Having the Greatest Potential of Increasing Our Understanding of Education</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intuitive-Thinking</td>
</tr>
<tr>
<td>Intuitive-Thinking</td>
<td>10</td>
</tr>
<tr>
<td>Intuitive-Feeling</td>
<td>4</td>
</tr>
<tr>
<td>Sensing-Feeling</td>
<td>4</td>
</tr>
<tr>
<td>Sensing-Thinking</td>
<td>1</td>
</tr>
</tbody>
</table>
the four Response Measure Two instruments. This instrument was designed to elicit quantitative as well as qualitative information regarding each respondent's reaction to each of the four methodologically diverse articles. Below are the results of the quantitative analyses, organized by article. Following this section will be a presentation of the qualitative responses to each article, organized by Mitroff-Kilmann research types.

**Intuitive-Thinking Article**

Table 13 clearly indicates that, as predicted, the NT research types found the methodological approach of this article significantly more appealing than did the other three types, $X^2_{(3)} = 9.52, \rho < .02$. Further examination of Table 13 reveals that while the NF and ST types generally expressed favorable reaction to the Intuitive-Thinking approach to inquiry, the majority of the SFs did not find this theoretical (and psychologically opposite) approach appealing as a method of investigation.

Regarding epistemological preference, Table 13 indicates that while all types generally valued the kind of knowledge derived from this article, the two intuitive orientations, NT and NF, were as a group, significantly more receptive to this type of knowledge than their relatively more concrete, sensing counterparts, $X^2_{(3)} = 7.51, \rho < .06$.

**Intuitive-Feeling Article**

Table 14 demonstrates that while all four research orientations found the methodological worldview of this article appealing, the two feeling types, the NF and the SF, expressed a significantly greater appreciation for this more "action-oriented" approach to inquiry $X^2_{(3)} = 8.27, \rho < .04$. 
**TABLE 13**

Cross Classification of Mitroff-Kilmann Research Type by Judgments Regarding the Methodological Appeal and Epistemological Validity of the Intuitive-Thinking Article

<table>
<thead>
<tr>
<th>Type</th>
<th>Methodologically Appealing?</th>
<th>Contributes to Knowledge?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>NT</td>
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<td>NF</td>
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<tr>
<td>SF</td>
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<td>13</td>
</tr>
<tr>
<td>ST</td>
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<td>14</td>
</tr>
<tr>
<td>Marginals:</td>
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<td>47</td>
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</table>

**TABLE 14**

Cross Classification of Mitroff-Kilmann Research Type by Judgments Regarding the Methodological Appeal and Epistemological Validity of the Intuitive-Feeling Article

<table>
<thead>
<tr>
<th>Type</th>
<th>Methodologically Appealing?</th>
<th>Contributes to Knowledge?</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>NT</td>
<td>21</td>
<td>11</td>
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<tr>
<td>NF</td>
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<tr>
<td>SF</td>
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<td>11</td>
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<tr>
<td>Marginals:</td>
<td>100</td>
<td>30</td>
</tr>
</tbody>
</table>
Table 14 also indicates that all four types wholeheartedly endorsed the contribution to knowledge made by the Intuitive-Feeling article. Again, the two feeling types expressed an especially strong endorsement of this type of knowledge, though not to a statistically significant degree. However, when the research types were collapsed into either Thinking or Feeling orientations, the analysis produced a significant difference between these two judgment modalities with regard to preference for the Intuitive-Feeling article's contribution to knowledge, $X^2(1) = 4.11, p < .05$. This was also true of the methodological appeal variable, $X^2(1) = 6.81, p < .01$.

Sensing-Feeling Article

Table 15 suggests that while all four types found the personalistic, affective style of the article appealing, the ST type did so to a much lesser degree. This same pattern of response was found in judgments regarding the value of knowledge derived from this methodological perspective. However, neither of the two relationships were found to be statistically significant.

Sensing-Thinking Article

Table 16 reveals a clear difference of perception regarding the value of the methodology and subsequent knowledge derived from the highly quantitative Sensing-Thinking article. With the exception of the ST respondents, all types indicated a highly negative attitude toward the methodological worldview of this quantitative research paradigm. As predicted, however, the ST types found the style of inquiry quite appealing, $X^2(3) = 8.01, p < .05$. Interestingly, though three of the four types found the quantitative method unappealing,
TABLE 15
Cross Classification of Mitroff-Kilmann Research Type by
Judgments Regarding the Methodological Appeal and
Epistemological Validity of the Sensing-Feeling Article

<table>
<thead>
<tr>
<th>Type</th>
<th>Methodologically Appealing?</th>
<th></th>
<th></th>
<th></th>
<th>Contributes to Knowledge?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>NT</td>
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<td></td>
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<tr>
<td>NF</td>
<td>29</td>
<td>10</td>
<td>29</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>SF</td>
<td>18</td>
<td>6</td>
<td>16</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>ST</td>
<td>19</td>
<td>13</td>
<td>21</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Marginals:</td>
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<td>38</td>
<td>88</td>
<td>39</td>
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</tr>
</tbody>
</table>

TABLE 16
Cross Classification of Mitroff-Kilmann Research Type by
Judgments Regarding the Methodological Appeal and
Epistemological Validity of the Sensing-Thinking Article

<table>
<thead>
<tr>
<th>Type</th>
<th>Methodologically Appealing?</th>
<th></th>
<th></th>
<th></th>
<th>Contributes to Knowledge?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>NT</td>
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<td>NF</td>
<td>15</td>
<td>24</td>
<td>28</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>SF</td>
<td>8</td>
<td>17</td>
<td>13</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>ST</td>
<td>21</td>
<td>12</td>
<td>27</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Marginals:</td>
<td>55</td>
<td>73</td>
<td>89</td>
<td>37</td>
<td></td>
</tr>
</tbody>
</table>
they, like the ST type, strongly endorsed the value of the empirical knowledge derived from this traditional social science methodological worldview.

The series of analyses performed thus far suggests that personality plays a role in judgments regarding both the methodological and epistemological validity of various styles of inquiry. This result, however, is only a partial finding. The question must now be asked, "What is the nature of these different perceptions?".

To address this question, the written responses contained in the Overall Response Measure and Response Measure Two were examined. The goal of this activity was to determine each psychological type's modal positive and negative attitude toward all four articles. In essence, this phase of the inquiry addressed the question: What did each type find particularly appealing and unappealing about each article? What follows are the results of this "qualitative" analysis organized by each Mitroff-Kilmann research type's reaction to the four articles.

**NT**

**Intuitive-Thinking Article**

As suggested by the quantitative findings, the NTs strongly endorsed the value of this article. By far, the article's most appealing dimension was reported to be the author's use of a theoretical framework to investigate the topic. Other positive aspects included the blending of theory and practice and the ability to generate further research. The adjective used most frequently by this type to describe their predictably most appealing article was "interesting". Although there was little criticism of this approach to inquiry, the few negative reactions centered
around a lack of empirical data and the author's perceived lack of objectivity. In addition, a few NTs found the article a bit too simplistic.

**Intuitive-Feeling Article**

The NT respondents, like all the other types, were generally quite favorable toward this article's emphasis on theoretically-based solutions to practical, real-life problems. Indeed, the NTs perceived the article's primary virtue to be its development of a workable plan designed to implement change. The article's organization and ability to stimulate thought were also cited as positive features. On the negative side, the NT respondents complained that the article was too wordy and too "applied". They also criticized the article for being one-sided and lacking substantiating data to bolster its conclusions. Whereas the most common positive adjective was "useful", the most frequent negative adjective was "vague".

**Sensing-Feeling Article**

By far, the most common positive reaction to this emotionally-charged article was that it stimulated thought. Though less frequently, the NTs further maintained that the article was valuable because it gave examples, was easy to read, and had the ability to generate further research. "Interesting" was, again, the most frequent positive adjective applied to the article. This type achieved its greatest consensus, however, regarding the article's major disadvantage. The NTs almost unanimously indicated that the article's primary weakness was its subjectivity and excessively emotional tone. To a lesser degree, they perceived the article to be too negative and lacking data to support its conclusions.
Sensing-Thinking Article

The NT respondents were generally favorable toward this example of conventional quantitative empiricism. They indicated that the article's strengths included its organization, use of empirical data, presentation of tables and charts, clarity, and, again, its ability to generate further research. Like the other three articles, "interesting" was the adjective most commonly used to express approval. Although negative reaction to this article was not dramatic, its primary weakness was perceived to be the author's use of charts and tables. Also mentioned as a drawback was the article's rather narrow and reductionistic approach to inquiry.

NF

Intuitive-Thinking Article

The NF respondents, though, overall, less enthusiastic toward this article, still focused on the use of a conceptual framework, the blending of theory and practice, and the ability to generate research as the article's major strength. Unlike the NTs, however, the NF respondents endorsed what they perceived to be the "personal" nature of the author's approach to the topic. Predictably, this type cited the article's lack of application as its major drawback.

Intuitive-Feeling Article

The NF's modal positive response to this article was its focus on the solution of real life problems. This type was quite impressed by their predicted article's practical approach to the implementation of change. "Humanistic" and "Personal" were two adjectives frequently
used to describe the value of this article. Interestingly, there were virtually no negative comments about either the article's style or inquiry or its contribution to knowledge.

Sensing-Feeling Article

Whereas the NTs expressing negative reactions to this article were almost unanimous in their criticism of the article's emotionality, the NF respondents were almost equally unanimous in their approval of this personalistic approach to inquiry. Indeed, the feeling orientation of the article was, by far, its most frequently cited strength. While the NFs also endorsed the article's ability to stimulate thought, it was the article's subjectivity that they found most appealing. Like the Intuitive-Feeling article, this work was also frequently described as "Humanistic". On the negative side, however, several NFs criticized the emotional tone of the article as well as its failure to produce new knowledge. They endorsed the emotionality of this highly affective article, however, by a ratio of approximately 3 to 1.

Sensing-Thinking Article

NF reaction to this approach was rather lukewarm. The article's strengths were generally perceived to be its focus on Maslowian concepts and its ability to generate further research. The NF type was, however, quite explicit regarding the nature of the article's weakness. While the NTs almost unanimously criticized the Sensing-Feeling article for being too subjective, the NF respondents strongly criticized the Sensing-Thinking article for lacking "the personal touch".
The author's use of tables and graphs was also criticized. Like their NT counterparts, however, several NF respondents described this approach to inquiry as boring and simplistic.

**SF**

*Intuitive-Thinking Article*

SF response to this highly theoretical article was qualitatively different from that of either the NT or NF respondents. Whereas the latter two types tended to indicate that the article's conceptual nature was its major strength, the modal positive response of the SF respondents focused on the article's readability, clarity, and brevity. On a more substantive, albeit less frequent, level of response, the SFs cited the personal interview aspect as one of the article's strongest qualities. The most frequently cited weakness was the article's limited ability to suggest practical change. Other weaknesses cited included the perception that the article was too complex, too theoretical, too scientific, and too unemotional.

*Intuitive-Feeling Article*

The SF respondents overwhelmingly endorsed this article's emphasis on practical solutions to "real world" problems. Indeed, the consensus was stronger among the SFs than it was for the equally enthusiastic NF respondents. The SFs also strongly indicated that the article's strengths included its ease of reading, people-orientation, ability to suggest implementation, and its author's personal style of writing. Similar to the NFs, this type expressed virtually no criticism of the article.
Sensing-Feeling Article

Again, like the NF type, the SF respondents exhibited a strong consensus regarding the desirability of this article's personal-subjective approach. The article's realism and ease of reading were also cited as strengths. While a few SFs criticized the article's subjectivity and perceived negativism, there were generally few reservations concerning this manner of approaching an educational problem.

Sensing-Thinking Article

SF respondents indicated that the strength of this article lies in its "scientific" nature, organization, potential utility, and its readability. Positive reaction to this article was, however, moderate and varied. This was not the case regarding the perceived weaknesses of the article. The presence of charts and tables was frequently cited as a major drawback. To a lesser degree, the article was criticized as being very hard to read, lacking application, impersonal, too theoretical, and, in general, boring. Whereas the SFs were most in agreement regarding the virtues of the Intuitive-Feeling article, they were similarly most consensual concerning the weaknesses of this traditional approach to research.

ST

Intuitive-Thinking Article

The ST respondents were generally favorable to this article. The article's strengths were perceived to be its organization, clarity, preciseness, and objectivity. Like the SFs, this sensing type also
mentioned readability as being a major virtue. The article's weaknesses were similar to those cited by the NTs. Specifically, the ST respondents criticized the article for lacking substantiating data, having limited utility, and for being too subjective.

**Intuitive-Feeling Article**

Like the other three types, the STs perceived the article's primary strength to be its emphasis on practical utility. In addition, most respondents praised the article's logical flow of ideas organization, and readability. The major weakness was perceived to be the article's length. Lack of data and the personal nature of the discourse were also viewed as drawbacks to the article's value.

**Sensing-Feeling Article**

Like the NT type, the STs found the article's major strength to be its ability to stimulate thought. Less frequently cited strengths included the article's perceived "real world" focus, its personal approach, and, again, its readability. The ST respondents, like their "thinking" counterparts, were most in agreement regarding their displeasure with what they considered to be the article's excessive subjectivity and lack of empirical data.

**Sensing-Thinking Article**

The ST respondents expressed more enthusiasm for this style of inquiry than another type reacting to the methodological worldview of their preferred article. STs stated that, by far, the greatest strength of this article was its reliance upon "hard" data to substantiate its
claims. STs made explicit references to the specific methodology employed as one of the article's major strengths. Interestingly, the STs were the only type to specifically endorse a particular methodological perspective. Other strengths mentioned by the STs included the article's "scientific" nature, as well as its organization, objectivity, and ability to generate further research. Contrary to the two feeling types, the STs specifically endorsed the article's use of tables and graphs. The few negative reactions focused on its length, difficulty of reading, and lack of specific solution.

In general, these results suggest that NT respondents tended to be the most accepting of all four types toward the diverse approaches to inquiry contained within the articles. While most enthusiastic toward theoretical frameworks, this type perceived all of the approaches as capable of stimulating thought and generating further research. The NF respondents similarly expressed a favorable attitude toward all four approaches. This type was, however, much more enthusiastic about the two feeling articles. The NFs appeared most impressed with the Intuitive-Feeling article's ability to promote realistic plans for change and the Sensing-Feeling article's subjective approach to inquiry. In many ways, the NF's appeared divided between their endorsement of conceptual models and their strong preference for "feeling"-oriented discourse. Also change-oriented, the SF type was the most enthusiastic about the personal, "real world" tone of the Sensing-Feeling article and the change-orientation of the Intuitive-Feeling approach. Like their sensing counterparts, the STs, this type frequently commented on the physical
form of the article, e.g., print size and organizational guidelines. In this sense, the SFs (and the STs) focused almost as much on the medium as the message. The STs were as extreme in their endorsement of the Sensing-Thinking article's approach to knowledge as the SFs and the NFs were in their criticism of this traditional method of social science research. Indeed, this type was as enthusiastic about their predicted style of inquiry as they were in their skepticism regarding the value of the personal-affective approach.

The final phase of the analysis involved an examination of Response Measure One, the 26 item semantic differential associated with each of the four articles. This instrument was designed to assess quantitatively the meanings attributed to each article by the four Mitroff-Klúmann research types. Table 17 presents the reliability estimates associated with each response measure. All four estimates appear to be acceptably high and quite similar in magnitude.

Table 18 indicates the article with the highest and lowest overall mean on each of the 26 items. Table 18 clearly demonstrates that the Sensing-Feeling and the Sensing-Thinking articles stimulated the most extreme overall responses. Indeed, this finding is not surprising given the prior analyses which have suggested that the emotionally-charged Sensing-Feeling and the relatively dispassionate Sensing-Thinking articles prompted the strongest reactions from the sample.

Table 19 represents the translation of highest and lowest item mean response into their respective adjectival anchors, organized by the appropriate article. These descriptive results suggest that the Intuitive-Feeling article was judged, overall, the most favored article,
### TABLE 17

Reliability Estimates of the Four Response Measure One Instruments*

<table>
<thead>
<tr>
<th>Response Measure One</th>
<th>NT</th>
<th>NF</th>
<th>SF</th>
<th>ST</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.83</td>
<td>.88</td>
<td>.86</td>
<td>.86</td>
</tr>
</tbody>
</table>

*These reliability estimates are alpha coefficients.

### TABLE 18

Highest and Lowest Rated Articles on Each of the 26 Items Contained in Response Measure One

<table>
<thead>
<tr>
<th>Item</th>
<th>Highest</th>
<th>Lowest</th>
</tr>
</thead>
<tbody>
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<td>2</td>
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<td>5.94</td>
<td>1.05</td>
<td>2.43</td>
<td>1.76</td>
</tr>
</tbody>
</table>

**NOTE:** Article 1 = Intuitive-Thinking Article  
Article 2 = Intuitive-Feeling Article  
Article 3 = Sensing-Feeling Article  
Article 4 = Sensing-Thinking Article
TABLE 19
Translation of Table 18 Means
Into Their Conceptual Anchors

**Article One**

<table>
<thead>
<tr>
<th>Concise</th>
<th>Weak</th>
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<tbody>
<tr>
<td>Abstract</td>
<td>Imprecise</td>
</tr>
<tr>
<td></td>
<td>Passive</td>
</tr>
</tbody>
</table>

**Article Two**

<table>
<thead>
<tr>
<th>Successful</th>
<th>Soft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meaningful</td>
<td>Concrete</td>
</tr>
<tr>
<td>Important</td>
<td></td>
</tr>
<tr>
<td>Useful</td>
<td></td>
</tr>
<tr>
<td>Relevant</td>
<td></td>
</tr>
<tr>
<td>Multiple</td>
<td></td>
</tr>
<tr>
<td>Helpful</td>
<td></td>
</tr>
</tbody>
</table>

**Article Three**

<table>
<thead>
<tr>
<th>Strong</th>
<th>Diffuse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active</td>
<td>Single</td>
</tr>
<tr>
<td>Emotional</td>
<td>Simple</td>
</tr>
<tr>
<td>Interesting</td>
<td>Intuitive</td>
</tr>
<tr>
<td>Personal</td>
<td>Rash</td>
</tr>
<tr>
<td>Clear</td>
<td>Subjective</td>
</tr>
<tr>
<td>Biased</td>
<td>Unscientific</td>
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<td></td>
<td>Feeling</td>
</tr>
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</table>

**Article Four**

<table>
<thead>
<tr>
<th>Hard</th>
<th>Unsuccessful</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complex</td>
<td>Meaningless</td>
</tr>
<tr>
<td>Rational</td>
<td>Unimportant</td>
</tr>
<tr>
<td>Cautious</td>
<td>Useless</td>
</tr>
<tr>
<td>Objective</td>
<td>Relevant</td>
</tr>
<tr>
<td>Scientific</td>
<td>Unemotional</td>
</tr>
<tr>
<td>Precise</td>
<td>Uninteresting</td>
</tr>
<tr>
<td>Thinking</td>
<td>Unhelpful</td>
</tr>
<tr>
<td></td>
<td>Impersonal</td>
</tr>
<tr>
<td></td>
<td>Vague</td>
</tr>
<tr>
<td></td>
<td>Unbiased</td>
</tr>
</tbody>
</table>
a finding consistent with the results found in Table 2. On the other hand, these results indicate that the Sensing-Thinking article was least valued among the four articles.

A common factor analysis was also performed on each of the four Response Measure One instruments. The goal of this analysis was to explore the nature of and similarity among the factorial structures associated with each of the four instruments. After a series of preliminary analyses, including both full and reduced model orthogonal and oblique rotations, it was determined that, depending upon the particular article, nine to eleven items best captured the essential hypothetical factors. The reduced model approach was selected on both logical and statistical grounds. Logically, it was determined that these items were most related to the evaluative purposes of the instrument. Statistically, the reduction of 26 to nine, ten, and eleven items promoted the probability of stable item-factor correlations (loadings) across replication samples.

The factor retention criteria was determined by both the meaningfulness of the factorial structure and the conventional eigenvalue greater than one criterion. In all four articles, both criteria converged to a two factor structure. These two factors were then rotated to an oblique analytic solution. Table 20 indicates the remarkable similarity of the four rotated solutions. In all four semantic differentials, the highest loading items on Factor I were Successful (1), Meaningful (2), Important (3), Useful (4), Relevant(5), Interesting (11), and Helpful (18). The item loadings in Factor II depended upon the particular article being evaluated. The
<table>
<thead>
<tr>
<th>Item</th>
<th>NT Article</th>
<th>NF Article</th>
<th>SF Article</th>
<th>ST Article</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Factor I</td>
<td>Factor II</td>
<td>Factor I</td>
<td>Factor II</td>
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<td>0.59</td>
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<td>0.79</td>
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<tr>
<td>16</td>
<td>-0.02</td>
<td>0.60</td>
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<td></td>
</tr>
<tr>
<td>17</td>
<td>0.63</td>
<td>0.11</td>
<td>0.83</td>
<td>-0.14</td>
</tr>
<tr>
<td>18</td>
<td>0.75</td>
<td>0.14</td>
<td>0.75</td>
<td>0.08</td>
</tr>
<tr>
<td>19</td>
<td>0.08</td>
<td>0.83</td>
<td>0.03</td>
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<tr>
<td>23</td>
<td>0.09</td>
<td>0.71</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

% of Common Variance

- NT Article: 65%
- NF Article: 75%
- SF Article: 76%
- ST Article: 79%

r_{I,II}:
- .31
- .50
- .37
- .35
Intuitive-Thinking article produced a second factor saturated with the Rational (15), Cautious (16), Objective (19), and Precise (23) items. The loadings on this factor for the other three articles indicate that these articles produced a similar factor pattern, but to varying degrees.

The substantive nature of the two factor vectors suggests the existence of two related modes of evaluation. The loading structure of Factor I appears saturated with items having in common the construct of OUTCOME evaluation. Factor II, on the other hand, indicates the presence of a related, but conceptually distinct, factor saturated with items having in common PROCESS evaluation. Thus, it appears that the semantic differentials associated with each of the four articles were clearly judged on the basis of both their success and their style of addressing the topic. This finding is not surprising given the nature of respondent comments presented earlier. Evidently, the major reactions among all four types to each article involved judgments regarding the value of the article's contribution to knowledge (OUTCOME) as well as its method of approaching the issue (PROCESS).

The final analysis performed on Response Measure One attempted to discern the combination of items which best succeeded in differentiating the four psychological types with respect to each of the four articles. Linear Discriminant Analysis (LDA) was the statistical methodology employed to accomplish this task. This increasingly popular multivariate procedure enables the investigator to mathematically decrease measurement space to a reduced model comprised of variables
which combine to maximize the difference among groups. Whereas the
goal of factor analysis is to maximize the variance common to all items
in one group, the goal of LDA is to maximize the discrimination among
several groups with respect to a given set of related variables. Also
similar to factor analysis, LDA provides each variable with a coefficient
indicative of its contribution to the measurement battery's discriminant
function(s). The task of the investigator is to determine a substanti-
atively meaningful pattern underlying the set of discriminating variables.
However, like its univariate counterpart, the analysis of variance,
there is no guarantee that a set of variables will succeed in differentia-
ting groups to a degree not accountable for by chance alone. That is, there
is no guarantee that a discriminant function will be statistically
significant.

The results of the LDAs performed on each of the four Response
Measure One instruments revealed that, indeed, there was no significant
discrimination among the four Mitroff-Kilmann research types on the
semantic differential associated with the Intuitive-Feeling, Intuitive-
Thinking, and the Sensing-Feeling article. There was, however, a
significant discriminant function associated with research type
response to the Sensing-Thinking article. Like the factor analysis
procedure, an attempt was made to achieve a reduced model of highly
significant inter-related items which succeeded in statistically
differentiating the four research type categories. Again, parsimony
from both a theoretical and a statistical point of view was the goal.
After both considerations, e.g., item meaningfulness, loading structure
on the full model discriminant function, both rotated and unrotated,
and an acceptable item number/sample size ratio, seven items were selected as both theoretically and statistically significant. These items included numbers 3, 4, 7, 12, 17, 18, 19. These seven items combined to produce a significant difference among the four psychological types, Rao's F approximation \( (21,330.77) = 2.88, p < .0005 \).

Table 21 presents the structure coefficients associated with each of the items. These coefficients represent the correlation of the items with the weighted discriminant function. An examination of Table 21 reveals that, while the Importance items played no part in discriminating the four types, judgments regarding the Sensing-Thinking article's Emotionality, Interestingness, Hardness (vs. Softness), Usefulness, and Helpfulness all contributed to a significant multivariate difference among the four groups. That is, groups scoring high on the discriminant function also scored high on these items, or, conversely, groups scoring low on these items, e.g., Uninteresting vs. Interesting, also scored lowest on the weighted function. In addition, a negative coefficient indicates that groups scoring low on this function tended to score higher on that item, and vice versa. For example, note that the objectivity item has a negative coefficient associated with it. Thus, low discriminant scores tended to score higher on this particular item.

Table 21 also provides the group centroids (multivariate "means") associated with each of the four Mitroff-Kilmann research types. These centroids represent the particular group's mean response on the discriminant function and, as such, indicates that the ST and the NT groups scored significantly higher on the function than did the
<table>
<thead>
<tr>
<th>Item</th>
<th>Structure Coefficient</th>
<th>Type</th>
<th>Group Centroid</th>
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<td>.23</td>
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<td>.69</td>
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<tr>
<td>12</td>
<td>.41</td>
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<td></td>
</tr>
<tr>
<td>17</td>
<td>.37</td>
<td>SF</td>
<td>1.09</td>
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<td>.16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>-.28</td>
<td>ST</td>
<td>2.03</td>
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</table>
SF and NF groups. Thus, the structure coefficients indicate that the two "thinking" psychological types perceived the highly quantitative Sensing-Thinking article to be significantly more Useful, Hard, Emotional, Interesting, and Helpful than the two "feeling" types, especially the NF respondents. Viewed from another perspective, the two "feeling" orientations judged the article to be significantly more unemotional and objective than did their "thinking" colleagues. Indeed, this centroid pattern, i.e., ST>NT>SF>NF, was found in all but one of the initial exploratory LDAs. It is interesting to note that this result is congruent with both the quantitative and qualitative data derived from the prior analyses, viz., the two "feeling" psychological types were significantly less enthusiastic about the Sensing-Thinking article than the two "thinking" types. Indeed, it is likely that the strongest discriminating variable, unemotionality, was used perjoratively by the SFs and Nfs in their largely negative response to this traditional approach to research.

While these results indicate that there is a significant difference between the ST type and the two "feeling" orientations, they didn’t directly address the question of whether these two psychological types differed from the ST respondents in the same ways. To pursue this question, two separate LDAs were performed, each comparing one of the feeling approaches to the ST group. Although this "follow-up" procedure may be subject to criticism similar to that of multiple t-testing in the ANOVA context, it was nonetheless pursued as a heuristic device intended to further probe type differences.
As expected, there was a significant difference between the SF and the ST types, Rao's F approximation \((7, 51) = 4.43, p < .005\). Table 22 indicates that the Importance item made a substantial contribution to the discrimination, whereas the Objectivity item played no role in differentiating between the ST and the SF types. In addition, the Emotionality item is much less of a discriminating factor in this function. The heart of the difference between the two types was that the STs found the Sensing-Thinking article significantly more important, useful, hard, interesting, and helpful than the SF's. That is, the two types appeared to significantly differ as items involved with the outcome factor.

There was also a significant discrimination among the NF and the ST types, Rao's F approximation \((7, 63) = 4.47, p < .0005\). Table 23 indicates a pattern of discrimination almost identical to that found in the four-group analysis but somewhat different than that found between the SF and the ST. Thus, while the overall pattern of response is similar between the two "feeling" psychological types, the SFs tended to view the ST article as less important than did the NFs, while the NF respondents found the article significantly more objective than their sensing-feeling counterparts.

In general, then, the results of these LDA's indicate that the two "thinking" Mitroff-Kilmann types viewed the highly quantitative research approach of the Sensing-Thinking article with much more enthusiasm than the two "feeling" orientations. Only the SF type, however, seemed to significantly question the value of knowledge derived from this approach.
TABLE 22
Vector of Structure Coefficients and Group Centroids
Associated With SF and ST Response to the Sensing-Thinking Article (Response Measure One)

<table>
<thead>
<tr>
<th>Item</th>
<th>Structure Coefficient</th>
<th>Type</th>
<th>Group Centroid</th>
</tr>
</thead>
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<td>SF</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>-.03</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TABLE 23
Vector of Structure Coefficients and Group Centroids
Associated with NF and ST Response to the Sensing-Thinking Article (Response Measure One)

<table>
<thead>
<tr>
<th>Item</th>
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<th>Type</th>
<th>Group Centroid</th>
</tr>
</thead>
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<td>ST</td>
<td>4.42</td>
</tr>
<tr>
<td>12</td>
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</tr>
<tr>
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</tr>
<tr>
<td>19</td>
<td>-.19</td>
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</tr>
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</table>
DISCUSSION AND CONCLUSIONS

The findings of the preceding chapter suggest that personality plays a significant role in influencing preference not only for methodological systems but for the knowledge derived from those systems. Both the quantitative and qualitative findings point to the inference that Jungian psychological type mediates judgments about the validity of knowledge created from differing methodological frameworks. In general, it was found that the NT, NF, and, especially, ST graduate students were significantly more receptive to information derived from their predicted investigative worldviews. The SF students, however, appeared to be torn between the action-oriented Intuitive-Feeling article and the highly emotional Sensing-Feeling article.

From an epistemological perspective, the two intuitive research types, the NT and the NF, found value in knowledge derived from all approaches to inquiry to a much greater degree than their sensing colleagues. Not surprisingly, the NT students focused on each article's ability to stimulate thought as its major value, while the NF respondents viewed the capacity to generate change as the primary strength of each article. On the other hand, the two sensing types appeared less enthusiastic about knowledge derived from perspectives significantly different from their own. The SF students, on the whole, strongly endorsed the "personal" knowledge presented in the two feeling articles and were generally unimpressed with the conceptual and quantitative information derived from the two thinking approaches
to knowledge. The ST students appeared even less flexible in their responses. This type was clearly the most emphatic in endorsing the value of knowledge derived from their predicted approach to inquiry. They were also much less impressed than their thinking counterparts, the NTs, with what they considered the excessive emotionality and bias exhibited by the Intuitive-Feeling approach and, especially, the Sensing-Feeling article. In many ways, their comments echoed those of the classic apologists for the experimental-quantitative research paradigm (for an excellent presentation and defense of this style of inquiry, see Cook and Campbell, 1978). As a group, the ST students, especially the males, seemed psychologically best suited to appreciate the value of knowledge derived from this traditional approach to social science inquiry.

The relationship between psychological type and methodological preference, per se, was, though less pronounced, still significant. Although the NTs maintained a fairly strong preference for their predicted methodological framework, the ST respondents were as emphatic in endorsing the Sensing-Thinking method as they were in preferring the knowledge derived from it. Interestingly, the two feeling types found each other's style of inquiry as personally appealing as their own predicted approach to knowledge creation. Psychological types also differed in the nature of their methodological preference. Generally speaking, the NT types endorsed the theoretical approach to inquiry, while the ST students strongly preferred the inductive, empirical approach. On the other hand, the SF and NF respondents were equally enthusiastic about action-oriented research
strategies aimed at solving "real-world", people-oriented problems. Unlike the two thinking types, however, the NFs and the SFs consistently cited the "personal" tone of the two feeling articles as especially appealing. In this sense, the two feeling types appeared to be heavily influenced by their judgment orientation toward life and less influenced by differences in their perceptive function than were the two thinking orientations. It was also found that, as expected, methodological preference was also affected by graduate status. Doctoral students, who comprised the bulk of the advanced quantitative methodology classes generally expressed a more favorable attitude toward the Sensing-Thinking style of inquiry than did the masters' level students. However, even after controlling for this effect, the personality variable played a significant role in influencing methodological preference.

Perhaps more significant than what these students preferred were the reasons they gave for their preferences. Their written reactions to each style of inquiry revealed a rich diversity of perceptions. As mentioned earlier, what each type perceived as the strengths and weaknesses of the four approaches also tended to reflect their own psychological orientation toward the world. To further illustrate this diversity, representative quotes from each type toward each article are presented below.
Intuitive-Thinking Article

NT: It is the best example of insightful theory construction. Isn't that what we need before all else?

NF: Acceptance of this ... complexity will more readily lead to diverse solutions -- rather than unique ones -- to educational problems.

SF: I found it too scientific for educational matters. It lacks humanness.

ST: I would like to see more statistical results. I think that this is more of a theory based on subjective observation than on scientific data.

Intuitive-Feeling Article

NT: I would prefer a sounder theory base and not so much pontification.

NF: Too little is done in the area dealing with how I feel about what I experience as a human.

SF: [The article] involves more interaction with colleagues on a personal basis. I'm more inclined to investigate and seek changes through personal interactions than via statistical surveys ... Interacting with people is what education is all about.

ST: It is a good description of a problem which will help another researcher devise a more scientific study.

Sensing-Feeling Article

NT: An understanding of any system is enhanced by focused observations on all the elements of the system. Human systems do not exist devoid of behavior.

NF: [The article] produces a type of knowledge that is difficult to measure, yet is probably one of the most potent types in terms of generating a challenge.
SF: Unscientific maybe, but probably more personally meaningful from most other approaches. Makes people think about what they are doing — at the gut level — not just as theoretical garbage as is so much in education.

ST: If an issue is important enough to merit time and attention, the least one can do is examine all sides dispassionately, garnering the facts necessary to convince oneself of any logical hypotheses. Emotions can be the motivating force but should not enter the analysis. "Knowledge" gleaned from emotional outpourings tend to be suspect ... an interesting commentary, but not very useful.

Sensing-Thinking Article

NT: I found [the article] too tersely written -- pseudo scientific -- with conceptual bases not clearly articulated.

NF: I would have no interest in [the article] because it is so dry and sterile. I would not enjoy analyzing the data. I would rather emphasize applicable, practical results.

SF: I do not like the charts and mathematical representations of information. This kind of research seems cold and unfeeling and of little value.

ST: [The article] makes no fanciful, broad, or biased emotional claims. What claims it does make are modest, yet illuminating. They are based on the author's appreciation and analysis of the facts at hand.

The quotes cited above reinforce the supposition that, rather than passively absorbing information, these individuals consciously grappled and came to terms with the meanings perceived in knowledge derived from diverse methodological frameworks. Further, it appears that psychological type played an active role in the formation of these judgments. What is known, it seems, is at least partially
conditioned by the psychological Weltanschauung of the knower. Evidently, what one type counts as significant knowledge may be viewed by another as an incoherent jumble of unrelated facts. In fact, the evaluation and integration of knowledge appears to be greatly influenced by judgments regarding the methodology used to produce the knowledge. Indeed, Table 12 shows that the two activities were highly related. Thus, judgments about the manner in which knowledge is created appears to be inextricably linked to evaluations concerning its validity and utility.

Based upon these initial findings, it seems apparent that the nexus between the knowledge creator and the knowledge consumer is a complex one. Psychological factors appear to affect not only the way knowledge is created, but the way that it is understood. Evidently, the process of communicating certain types of knowledge is interactive, rather than recursive. That is, information is not directly transmitted by its creator into the mind of the passive reader. Rather than internalizing "raw" information, the findings of this study suggest that individuals actively respond to and evaluate the meta-methodological assumptions which underlie the knowledge they perceive. As evidenced by the qualitative results, this process serves initially to accept or reject knowledge derived from different epistemological premises as well as influence the way "acceptable" knowledge is integrated into substantive understandings. The response of the SF to the Sensing-Thinking article illustrates the initial screening process. Reacting to the objectification and measurement of human qualities, the SF states: "I do not like the charts and mathematical representations of information. This kind of research seems cold and unfeeling and
of little value." This reaction very likely epitomizes the quintes-

cs-sential feeling response to a highly "thinking" approach to inquiry. That is, the quote suggests that not only the stylistic format, but the meta-methodological attributes of detachment and objectivity, prevent this individual from accepting the validity of knowledge derived from this methodological perspective. The process of sub-

stantive integration of acceptable knowledge is illustrated by the NT's response to the Sensing-Feeling article: "An understanding of any system is enhanced by focused observation of all the elements of the system. Human systems do not exist devoid of behavior." This quote tacitly endorses the methodological premises underlying the highly affective, personalistic Sensing-Feeling article. More sig-

nificantly, however, it illustrates the manner in which the legitimized knowledge is integrated into this NTs presumably theoretical and abstract view of the world. In these two examples, both respondents actively evaluated the methodological premises of the inquiry and made judgments concerning the value of its subsequent findings. For the SF, the knowledge derived from the Sensing-Thinking article was unacceptable due to his perception that the underlying meta-

methodological assumptions were invalid. For the NT, acceptance of the Sensing-Feeling article's methodological underpinnings led him to accept the validity of the knowledge, but only in ways congruent with his orientation toward the world. That is, the type of meanings derived from knowledge appear to be highly determined by the psycho-

logical worldview of persons perceiving it. If it is true that personal-

ality mediates these kinds of judgments, a number of implications are apparent.
At the pedagogical level, it seems clear that any attempt to train graduate students to implement and/or appreciate a system of methodological principles must be conditioned by the awareness that the meta-methodological premises upon which the system is based are likely to influence different types of students in different ways. That is, for example, experimental-quantitative research courses will probably be especially appealing to ST and NT students. This methodological paradigm’s emphasis on objectivity, precision, and the absence of the human element in measurement and data analysis is highly congruent with the "thinking" types psychological orientation to the world. On the other hand, "feeling" types, especially SF students, may have considerable difficulty appreciating the value of this highly impersonal approach to human inquiry. Although this inference probably holds truer at the introductory rather than at the advanced level, the findings of this study suggest that the influence of personality type on methodological and epistemological judgments still exerts a significant influence even on advanced students.

Armed with an awareness of the psychological diversity which exists in these courses, the experimental-quantitative instructor may be able to enhance his or her teaching by augmenting the traditional lecture-theory format with a personal-experiential approach as well as an emphasis on the way in which significant substantive problems may be solved through this particular style of inquiry. Admittedly, this suggestion, while perhaps not quixotic, may be problematic. Indeed, it may be the case that it is as difficult for instructors to consciously transcend the limitations of their own psychological world-views as it is for many of their students. However, options such as
guest speakers, course handouts, actual research experience, and small group discussions may be useful in engaging students who have a tendency to reject this approach to knowledge creation. Indeed, there is a great deal of evidence that, apart from affecting broad methodological and epistemological attitudes, personality type exerts a strong influence on the way students learn (McGaulley and Natter, 1974). Lawrence (1979), for example, has asserted that Jungian personality type greatly influences the learning process. Lawrence contends, for example, that intuitive types tend to learn best when a broad overview of the topic is presented. Sensing types, on the other hand, seem to learn best when the topic is presented initially through the use of concrete examples. Furthermore, Lawrence argued that extroverts and, most likely, feeling types will learn best through small group discussions, while introverts will prefer to work through a problem internally, without the aid of their peers. Thus, the way professors conceptualize and present a system of inquiry will likely have a major impact on their instructional success, especially with those students who not only think, but learn about research in non-traditional ways.

The question of psychological effects on one's perception of knowledge also has implications in the area of professional communication. Most communications between social science professionals is achieved through professional, scholarly, and research journals. Based upon the findings of the present study, the question is, of course, what is being communicated and to whom? It seems likely that consumers of scholarly and research literature are subject to the same psychological
influences as the graduate students in the present study. If this is true, then the process of large scale knowledge communication might benefit from an increased awareness of the "human" effect on the transfer of information. Indeed, this effect is likely to be especially potent in fields of study which are subject to a rigid bifurcation between the knowledge creating and knowledge consuming communities.

It is widely known, for example, that much of the educational literature is created by scholars attracted to and trained in the experimental-quantitative research paradigm. The problem, of course, is that the potential readership in education is much less homogeneous. In addition to academic scholars who share the methodological and conceptual paradigms of the knowledge creators, there are a wide variety of teachers, administrators, and government officials whose training, experience, and quite likely, psychological type is quite different from that of the knowledge creators. Journal editors, especially those validating knowledge in professionally diverse fields of study such as education, would benefit from an increased understanding of the effect of these factors on the way knowledge is perceived. What, for example, would be the effect of publishing a valuable (albeit highly quantitative) piece of research in a journal whose readership is comprised of professionals with little awareness of, interest in, or psychological predisposition toward this paradigm of inquiry? Would the findings of the article be rejected due to the professional and/or psychological dissonance which may exist between the knowledge creator's and the knowledge consumer's discrepant methodological and conceptual worldviews? Would an SF practitioner, for example, dismiss a priori
the knowledge derived from the methodological framework of an ST academician? Furthermore, even if the methodological paradigm is endorsed, how would the information be integrated into the reader's understanding? An even more fundamental question, of course, is whether psychological type differences have an effect on whether journals are read at all. Indeed, it may be the case that certain types of individuals don't even attempt to consume knowledge presented in journals whose methodological focus is clearly different from their own.

These kinds of concerns have direct implications for the important work of social science journal editors. As "gatekeepers" for their profession, these men and women are required to make difficult decisions about what types of inquiry and subsequent knowledge are to inform and benefit their readers. Indeed, many editors not only attempt to provide knowledge "useful" to their presumed readership, but frequently assume active roles in the creation of new issues and conceptual frameworks. Is it possible that psychological type has an influence on these types of activities? That is, do some journals implicitly reflect the psychological worldviews of their editorial staff? If these men and women are subject to the type of influences detected in this study, the cliche' of an editor "putting his stamp" on a body of knowledge takes on a whole new dimension.

Clearly, much research in this and other domains of knowledge creation is needed. Unlike the sociology of science, which addresses sociological influences on the way knowledge is created and disseminated, the investigation of psychological factors is still embryonic. Although the
present study represents an initial probe into this fascinating, but largely unknown, intellectual arena, much further work is necessary if our understanding is to be increased. Methodologically, future investigations should attempt to sample larger, more diverse populations. While the sample size for this study was adequate to detect certain promising relationships, a larger sample would allow the investigator to confirm the existence of these, and other, possibly more subtle, factors on the way knowledge is perceived and evaluated. The nature of the sample should be expanded to include not only graduate students in education, but students in other academic fields of study. Future inquiry should also attempt to achieve a better balance between the number of male and female respondents. The preponderance of females in the present sample, while indicative of the target population, nonetheless limits the generality of the findings. While the present sample revealed a wide variety of psychological types in education, other disciplines may present a different profile. What, for example, are personality types of graduate students in sociology? Does their psychological orientation significantly influence predilection for, say, quantitative versus ethnographic inquiry? Indeed, does psychological type affect judgments about methodology among students in the physical sciences?

In addition, future inquiry should also examine the effect of psychological type on the way administrators and practitioners assimilate knowledge. Although many graduate students, especially in education, are training for careers in these two domains, there may be differences in both the nature and degree of psychological influences among professionals functioning in different work environments.
Research should also continue to examine the way psychological factors influence the creation of knowledge. While the present study focused exclusively on factors influencing knowledge assimilation, subsequent research needs to probe the effect of psychological world-views on the way knowledge is formulated, especially in low paradigm fields of study. These kinds of studies should examine and attempt to delineate differences in the way psychologically diverse investigators conceptualize a research problem, design a methodology, analyze data, and frame conclusions. This type of inquiry could focus on knowledge creators within one discipline as well as compare the knowledge creation process across various academic fields of study. It would also be interesting to compare academic knowledge creation processes with those developed by non-academic practitioners. It is quite conceivable that psychological type may be related to differences between formal and informal methods of acquiring and integrating knowledge.

As mentioned earlier, future research should explore the effect of these factors on the way knowledge is validated. That is, do certain types of editors and reviewers tend to regard certain styles of inquiry as, a priori, more or less valuable than other ways of creating knowledge? And, if so, is their psychological–methodological pre-dispositions congruent with those of both their contributors and their readers? The existence of a fundamental dissonance between these three communities would raise a further, more significant, question regarding the meaning of knowledge in fields of study where methodological as well as professional consensus is either low or not clearly articulated.
Indeed, even in highly consensual disciplines such as physics and chemistry, there may be differences between Szent-Györgyi's Appollonian and Dionysian scientists in their perception of both the validity and usefulness of certain approaches to knowledge creation.

Lastly, different types of psychological effects on the assimilation of knowledge should be examined. While this study has provided some evidence that Jungian psychological type plays a role in influencing epistemological as well as methodological preference, it is quite likely that other personality factors also play a significant role. Future inquiry, should broaden its conceptual focus to include an examination of the way intellectual development, perceptual orientation, and learning style influence the assimilation of knowledge. William Perry (1970), for example, has formulated a schema which outlines the way college students develop through various stages of conceptual complexity. These stages, which range from a primitive, "either-or" mode of conceptualization to one which acknowledges the existence of multiple and often equally valid intellectual perspectives, may very likely influence the way individuals make judgments about knowledge. Indeed, some evidence of this phenomenon was found in the present study. Sensing types, for example, tended to either praise or condemn the type of knowledge derived from the four methodologically diverse articles. On the other hand, the intuitive respondents were, as a group, much more willing to endorse the validity of knowledge derived from very different approaches to inquiry. Future inquiry might attempt to determine whether there is an interaction between personality type and intellectual complexity with regard to the manner in which various
types of knowledge are evaluated and integrated. Does, for example, the intuitive worldview tend to be associated with a higher degree of intellectual complexity and, if so, does this interaction exert a greater effect on the perception of knowledge than either intellectual complexity or psychological type considered independently?

Future work might also examine the effect of perceptual orientation on the way knowledge is perceived. This extensively researched conceptual framework differentiates people into two types based upon their ability to perceive individual elements within a larger context (Witkin, Faterson, Goodenough and Karp, 1962; Witkin, Moore, Goodenough and Cox, 1977). Field-independent types tend to identify specific elements within a perceptual field to a significantly greater degree than field-dependent individuals who tend to be more limited in their ability to perceive isolated factors existing within an organized whole. Witkin and others have argued that these two types also differ along a variety of personality dimensions. Future research might attempt to assess whether perceptual orientation exerts an influence on the kinds of understandings derived from various approaches to inquiry. That is, the detail-oriented sensing function may be related to the highly analytic field-independent disposition. Intuitives, on the other hand, may be overrepresented in the more holistic field-dependence category. Awareness of this relationship might improve our ability to better predict and understand the factors which influence the way discrete information is perceived and integrated.

As discussed earlier, future inquiry might also examine the effect of learning style on the way knowledge is assimilated. Kolb (1980)
has contended that individuals learn through predictable modalities. He has argued, for example, that certain types of people learn best through practical, hands-on experience, while others learn best from a more detached, theoretical overview of the topic. Although, to date not widely investigated, Kolb's theory may be useful to the present line of research. That is, it may be the case that the manner in which knowledge is presented to the student significantly affects his or her judgment regarding both its validity and utility. Indeed, there is evidence that Kolb's concept of learning style is highly related to the Mitroff-Kilmann typology (Phillips, Peters, and Ryan, 1981).

Doubtless there are many other conceptual and methodological ways of improving this initial exploration of the way humans perceive and make decisions about knowledge. Like most empirical research, this study was limited by sample size, theoretical incompleteness, as well as other technical as well as conceptual limitations. From a broader perspective, however, this study represents only one way of creating knowledge about the topic. Obviously, investigators with different psychological worldviews need to pursue this subject in ways which reflect their own personal as well as professional orientation toward the world. If they do, the conceptualization, design, analysis, and conclusions may take a form quite different from that presented here. Without the richness of these multiple approaches to knowledge, our understanding of this fascinating topic will remain necessarily partial and incomplete.

In closing, however, it must be noted that there are significant limitations to achieving this goal. That is, while multiple perspectives
need to examine the effect of personality on the perception to knowledge, some approaches to knowledge creation are, in reality, "more equal than others". Unfortunately, this fact is frequently overlooked by those of us whose research preferences carry the methodological imprimatur of our professional communities. The problem is that the dominant experimental-quantitative paradigm, while valuable, has become institutionalized as the sole arbiter of what counts as legitimate knowledge, especially in ill-defined empirical fields of study such as education. The question raised by scholars such as Mitroff and Kilman (1978) is whether knowledge derived from different categories of methodological assumptions offer similar possibilities of increasing our understanding of the human condition. Does, for example, the type of knowledge created by the highly affective Sensing-Feeling style of inquiry give us insight into aspects of reality overlooked by more detached and objective procedures? Does the Intuitive-Feeling approach to inquiry, with its use of methodologies aimed at producing "useful" knowledge, provide a valid way of conceptualizing and addressing the kinds of problems so vexing to education practitioners? The results of this study indicate that a majority of the students in the sample were very enthusiastic about the value of these two styles of inquiry and the type of knowledge they produce. This enthusiasm was, however, not shared by the ST students who, as expected, overwhelmingly rejected these "feeling" approaches to knowledge creation. In many ways this situation serves as a microcosm for the methodological chauvinism so ingrained in the social sciences. The "feeling" methodologies posit an implicit worldview alien to that of the traditional
Sensing-Thinking manner of conceptualizing research. The tragedy is that very often advocates of the dominant investigative framework are unwilling to accept the value of different, but potentially valuable, approaches to knowledge creation.

This condescending attitude is unfortunate, not only on epistemological grounds, but also from a humanistic perspective. While the psychological dispositions of the ST and NT types are reinforced by exposure to the experimental-quantitative paradigm, the "feeling" types learn quickly that their curiosity must either be channeled into established, though dissonant, modes of thinking or they must be content to let "research types" define what is to count as significant knowledge in their chosen professional field. The consequence of this situation is not only that potentially valuable forms of knowledge are eliminated from serious consideration, but that human beings are diminished in the process. Indeed, it has been the experience of this investigator that some students become discouraged about doing research because they have failed to understand and appreciate the intricacies of statistical methodologies. This close identification of "research" with technical procedures has doubtless led more than one student to stifle his or her desire to investigate a substantive domain.

It is not the intent of this investigator to diminish the value of the experimental-quantitative paradigm. Indeed, much of the present study relied on highly sophisticated statistical analyses. The problem is not inherent in the nature of this, or any other, methodology. The problem occurs when one methodological faction attempts to legitimate their perspective at the expense of another. The point to
be made is that alternative investigative perspectives need to be articulated and developed in a climate which acknowledges the value of diversity. Fields of study such as education have much to gain by accepting the possibility that multiple approaches to inquiry are capable of stimulating new understandings. Perhaps it is time to realize, for example, that there is as much truth in the Sensing-Feeling article's "emotional outpourings" as there is in the Sensing-Thinking article's tables and graphs. Clearly, the realities to which they speak are different. Is it necessary, however, to infer that the existence of these differences must be resolved in favor of one "superior" way of knowing? Although factors such as personality type may influence collective preferences for one style of inquiry, it is a disservice both to knowledge and to the people who wish to understand it to translate these preferences into rigid methodological imperatives. Advocates of all approaches to research need to transcend the limitations of their methodological weltanschauungs and consider the synergistic possibilities which await a broader awareness of the reality which they all only partially comprehend.
Dear Participant,

We would like to thank you for volunteering to participate in this research study. We hope that you will find the experience both enjoyable and thought-provoking. A complete explanation of the research will be given after all the data have been collected.

The purpose of this study is to investigate the way people differ in their response to knowledge derived from different approaches to inquiry. To accomplish this goal, we ask that you read and respond to four articles taken from the educational literature. Each article illustrates a distinct way of conceptualizing and addressing a similar substantive topic. It is important for you to understand that, though different, each of the four articles reflects a legitimate approach to creating knowledge. We ask that you respond to each article in terms of your reaction to the method illustrated.

We want to make it clear that this is not an experiment. We are not "manipulating" you in any way. There are no "trick" questions included in your response materials, nor are there any right or wrong answers to the questions that you will be asked. All that we request is that you carefully consider each article and respond to the response measures as thoughtfully as possible.

Please complete the Consent Form immediately following this letter and bring it to the next class session. In addition, we would like for you to respond to the Informational Survey before you begin reading the articles. Bring it to class on the date that the other response materials are due.

As a final note, we would like to reinforce the fact that your responses to all of these materials and the personality instrument will be held in the strictest confidence. The only identifying feature on your responses will be a six-digit code.

Again, thank you for your participation.
THE OHIO STATE UNIVERSITY

CONSENT FOR PARTICIPATION IN
SOCIAL AND BEHAVIORAL RESEARCH

I consent to participating in (or my child's participation in) a study
entitled An Investigation Into The Relationship Between Jungian
Psychological Type Theory and Preferred Styles Of Inquiry.

Charles E. Peters

(Investigator/Project Director or his/her authorized representative)
explained the purpose of the study and procedures to be followed. Possible
benefits of the study have been described as have alternative procedures, if
such procedures are applicable and available.

I acknowledge that I have had the opportunity to obtain additional in-
formation regarding the study and that any questions I have raised have been
answered to my full satisfaction. Further, I understand that I am (my child
is) free to withdraw consent at any time and to discontinue participation in
the study without prejudice to me (my child). The information obtained from
me (my child) will remain confidential and anonymous unless I specifically
agree otherwise.

Finally, I acknowledge that I have read and fully understand the consent
form. I have signed it freely and voluntarily and understand a copy is avail-
able upon request.

Date: ____________________________ Signed: ____________________________

(Participant)

(Investigator/Project Director or
Authorized Representative)
A Few Suggestions Before You Begin

We want to provide you with a framework for thinking about the articles before you begin reading. Here are a few suggestions:

1. Don't get "bogged down" with specific details or technical issues. We don't want you, for example, to respond to an article on the basis of whether the author should have used a different set of statistical procedures. This exercise is not a research achievement test. No technical knowledge of research design or statistical analysis is required. Some articles will contain statistics, others won't. Rather than focusing on the merits of a specific technique, we want you to respond to the "idea" of performing inquiry in a certain way. While statistics or other techniques may be used to express a particular "philosophy" of inquiry, they are not the philosophy itself. The same reasoning applies to all of the approaches to inquiry that you will be asked to consider. In a sense, we want your response to the artist's style of painting rather than his individual brush strokes.

2. We don't expect you to be an "expert" on the substantive issue addressed in all four articles. In fact, the more that you know about this topic, the more you may be tempted to focus on the articles' content rather than their approach to conceptualizing and addressing the issue. We would like for you to respond to the "style" of the article rather than its substance.

3. We recommend that you overview all four articles before concentrating on each individually. Try to get a general "feel" for the different approaches presented. After you have done this, read each article and respond to the two response measures provided immediately following the article. For example, after reading the article entitled "Overcoming Faculty Resistance," complete the two response measures associated with that title. After you have read and responded to all four articles, please answer the questions contained in the Overall Response Measure.

4. Please take your time when considering each of the articles. Try to avoid the temptation to get this task "out of the way" at the last minute. Your careful consideration of and thoughtful response to the articles presented is crucial to the success of this study--and my dissertation.

5. Finally, you may respond positively to the style of more than one article. This is fine. Feeling good about one of the articles does not necessarily mean that you have to dislike the others.
INFORMATIONAL SURVEY

Please respond to the following questions.

1. Sex: Male___ Female___

2. Why did you enroll in this course? Required___ Elective___
   2.1 If this course is an elective, please give your reason for taking it.

3. What was your undergraduate major? ___________________________

4. Are you a doctoral student? Yes___ No___
   4.1 If so, what was your master's degree area of specialization?

5. What is your current academic area of specialization?
   ___________________________

6. Is "statistical" research the predominant type of inquiry found in the literature of your academic area? Yes___ No___

7. Have you had previous courses in research methodology? Yes___ No___
   7.1 If so, please describe them:

8. Have you had any research experience? Yes___ No___
   8.1 If so, what kind? ___________________________

9. Do you currently hold a graduate assistantship at CSU? Yes___ No___
   9.1 If not, what is your current employment?

10. As of right now, do you plan to take more research methodology courses? Yes___ No___
    10.1 If yes, will any of these courses be elective? Yes___ No___

11. As of right now, do you plan to do research after graduation? Yes___ No___

Please turn this paper over and continue.
12. What do you believe will be the primary benefit of taking this course?

13. After graduation, what type of position will you be seeking?

13.1 Is it likely that you will be required to do research in this position? Yes___ No___

13.2 Is it likely that you will be required to read research articles in this position? Yes___ No___

14. Right now, when you think of doing research, what do you think of?

15. What adjectives would you use to describe someone who is a good researcher?

16. On the scale below, please indicate how similar you are to the person you have described in question 15. A check on position "1" indicates a very high degree of similarity; a check on position "7" indicates a very high degree of dissimilarity.

Very Similar 1 2 3 4 5 6 7 Very Dissimilar
OVERALL RESPONSE MEASURE

Instructions

Please respond to the following questions concerning your impressions of all four articles. Each article is identified by a number located on its title page. Please use this number when responding to the questions. Try to answer in as much detail as possible. If you need more space, continue your responses on a separate sheet of paper.

1. In your opinion, which of the four articles has the greatest potential of making a contribution to the field of education? Why?

2. Which of the four articles holds the least promise of making a contribution to the field of education? Why?

3. Which article approaches the issue in a way that is most appealing to you?

4. Which article approaches the issue in a way that is least appealing to you?

PLEASE TURN THIS PAGE OVER AND CONTINUE
5. In your opinion, which article is the **most** scientific?

6. In your opinion, which article is the **least** scientific?

7. Which two articles seem the **most** alike to you? Why?

8. Which two articles seem the **least** alike to you? Why?

9. Which article was the easiest to read?

10. Which article was the most difficult to read?

11. Which article did you read first?

12. Which article did you read last?

13. Based upon your "images" of the four authors, which author did you find most personally appealing? Why?
Faculty Development: A Stage Conception

The subject of faculty development has gained prominence in the field of higher education as a number of recent publications attest, but the term has various meanings. Often it mirrors common sentiments of mental health and adjustment and refers to ways in which faculty can learn to function more effectively with minimum stress and tension. This definition is useful, but it does not adequately touch one essential facet of the development of faculty members: the growth of increasingly complex ways of thinking and acting. To conceive of faculty development as less than increased complexity, and thus possibly reduced tension and concern over one's role and responsibilities, will result in inadequate programs for assisting faculty growth. These programs must be based on an understanding of personality development as a whole, not just more secure adaptation to a professional role. Toward this end, this article describes a scheme of stages of faculty development, an idea which I had formulated previously but am presenting now in light of more recent research.

The notion of looking at college professors from a psychological perspective and creating typologies or schemes to describe their diversity is by no means a novel idea. Aronson's "The Teacher as Model" is certainly an important formulation as is the contribution of Mann and associates. But these schemes view each pattern as a discrete entity, dynamically unrelated to others in the typology. It is my belief that important practical and theoretical advances can be made if important differences between professors can be described from a developmental perspective. Faculty can then be located along a continuum and developmental goals can be specified for individual faculty.

As in the case with any scientific construct, the origins of this developmental progression scheme were theoretical and empirical. Although the first conception of faculty as developing adults was formulated by my associates, Robert Shunka and J. Wesley Brown, my plan developed along somewhat different theoretical lines, using as a point of departure the work of such developmental theorists as Loevinger and Wesler and Perry. The unique aspect of their work is that they examine the form or structure of an individual's assumptions about social reality and how these change through life. Development means dealing with experience in increasingly sophisticated and complex ways and being able to integrate this complexity into stable structures. The focus here is not on the content of development, the specific issues that preoccupy an individual at a given time in life, but the structures he uses to generate that content. As Kohlberg and Gilligan note, such theorists look at how an individual thinks about such matters as good and bad, or truth and beauty, but not what he thinks about at any given time.

With this general point of view in mind I examined the protocols of 24 interviews that had been carried out with faculty members at a large state university. These interviews covered such matters as personal and educational background, as well as views on teaching, students, colleagues and professional goals. The questions were open-ended and faculty were encouraged to respond freely and fully.

Using these interview data I ordered faculty along a continuum according to the complexity of the assumptions which underlay the meaning they gave to their professional lives. I analyzed their views concerning the process of education, their conceptions of the nature of knowledge, their philosophy of teaching, their notions of professional roles, their relation to their discipline, and finally their attitudes toward colleagues and students.

The continuum portrayed a progression from a position where faculty see knowledge as an unambiguous entity, and where teaching consists of simply presenting facts to students, to a position where they begin to see knowledge in more differentiated terms and recognize the need to use various strategies to help students gain understanding. Farther along the progression is a more problematic, even relativistic notion of knowledge, accompanied by a view of teaching as helping the student develop frameworks for ordering unrelated facts. The concept of professional role evolves from simple definitions of right and wrong actions, to an awareness of choice in roles and a sense of possible restrictions and limitations, and finally to a sense of style and tolerance within their choice of roles. In relation to others the progression goes from a view of people in moralistic terms of good and bad, to a more psychologically insightful notion of people that recognizes the origins of manipulation and inequality in human relations, and then to a sense of commitment in a context of tolerance and reciprocity.

After sorting faculty along this continuum I grouped them into five levels or stages.

Stage One

At this level the faculty member has a simple view of his role and the nature of his work. His professional reference group provides his role definition, and he
enacts his role in conventional fashion. Thus, in a large university he might see himself in terms of what is expected of a member of his academic discipline, while at a small college he might adopt local conventions. Similarly, he defines educational goals in accord with his reference group and may believe that training new recruits for his profession is the sole aim of education. His goals are distinguished by their rather stereotyped form rather than their specific content. Knowledge is seen in absolute terms, that is as unproblematic facts. Education in turn consists of pouring facts into an empty vessel, the student, who assimilates a body of knowledge. Views of students, grading procedures, and the like are relatively undifferentiated. There are right and wrong procedures and judgments, and they may be easily catalogued. Grading reflects the degree to which students know right from wrong information. Opinions are generally autocratic and are distinguished by their lack of complexity. Their presentation tends to preclude argument and alternative points of view. For this kind of professor the world is divided into areas of good and bad by some authority, usually his reference group.

Nine percent of the sample were in Stage One.

Stage Two

The professor in this stage has a more differentiated notion of his role than does his Stage One colleague. He may still define his role in relation to conventional reference groups, but he demonstrates increasing distance from them. Nonetheless, the certainty of right action as derived from authority is never in doubt. His view of knowledge is more complex than Stage One. Although the aim continues, to be the acquisition of facts by students, this faculty member is interested in using helpful techniques. The nature and source of knowledge are clear, but one must find the right methods for presenting them. He still sees people in monolithic good and bad terms, but he is willing to try to explain their behavior, usually in terms of simple causal relationships—for example, between behavior and social class or behavior and childhood experience. This professor has had some experience with diverse opinions, with views contrary to his own, and so his position is relatively articulate. Thirty-six percent of the sample were in Stage Two.

Stage Three

The Stage Three faculty member has more distance from reference group definitions of his role. He has a heightened awareness of possible alternatives in his teaching and professional role, but he may display some uncertainty about how to integrate diverse choices. This individual has considerable psychological insight into interpersonal relations. He can see students and colleagues in terms of inner motives and their relation to behavior. As an educator he seeks to create conditions in which students may learn, and he believes they can learn only by active effort. This faculty member adheres to a problematic idea of knowledge. His philosophy of education may appear to be permissive. His ability to think in psychological terms and his appreciation of human variability contribute to a heightened sense of responsibility and conscientiousness. Although he is more open to choice and diversity than are his less developed colleagues, he has not integrated these elements. Eighteen percent were in this stage.

Stage Four

The prototypic faculty member of Stage Four not only has a sense of freedom and relativity in social roles, he has evolved a personal style of functioning. He has mastered some role conflicts and has achieved partial synthesis. He is liberated from the excessive conscientiousness that at times characterizes the faculty member in Stage Three. He has a sense of reciprocity in human relations and education: he believes a faculty member should not only give but get. Learning is viewed as the ability to synthesize, not just absorb, diverse facts and information. Students must discover answers for themselves. At this stage the professor can readily see things from the student's perspective. The permissiveness which sometimes appeared in Stage Three has been replaced by a slightly more structured view which still values the autonomy of the student. Synthesis among diversity and complexity is stressed. Twenty-nine percent of the sample fit in here.

Stage Five

At this stage the faculty member has a more clearly articulated position than does his colleague of Stage Four. For example, included in his philosophy of education is an explicit concern with helping students develop a sense of values or character. He has a real appreciation of the student's situation and how material may best be learned. Not only has he realized the reciprocity of Stage Four, he is able to find satisfaction in relationships with students of whom he may be critical. This tolerance is a conscious or explicit construct; he is aware that he has developed a sense of tolerance, an ability to live with diversity. Considerable cognitive complexity is evident at this stage. The prototypic faculty member is able to accept contradiction and ambivalence in human functioning and irony in social processes and to carry on effectively within such contexts. Individuals who reached this stage constitute eight percent of my sample.

Validation

In developing typologies, it is customary (and considered acceptable) to stop at the point we have now reached, the level of theory generation. I believed, however, that it was necessary to move beyond generation to validation. If the scheme was valid, there should be a high level of agreement among raters using the scheme. I had two psychologists rate a sample of 92 interviews of faculty from three institutions: a large state university, a medium size state college, and a small private college. The level of agreement, measured by Pearson's product moment correlation, was .87 for the whole sample (p < .001). The level of agreement was such that comparable results would occur by chance less than one time in a thousand. These results were more than satisfactory to assure that there was an "objective"
Further Considerations and Implications

Loevinger’s theory of a developmental model has the following characteristics: (1) there is an invariable order of the stages of development; (2) no stage can be skipped; (3) each stage is more complex than the one preceding it; and (4) the transition from one stage to the next is not automatic. I believe the scheme has been presented fully developmentally in this sense, except for one limitation: faculty members may be located at stages higher than the first or second with which they are familiar. In some cases there is evidence that they passed through these first stages when they were graduate students or even undergraduates. For example, in a number of interviews faculty gave retrospective accounts of their own development which seemed to match that described by the scheme.

The stages do not encompass the whole of ego development as conceived by Loevinger and Wessler. I am concerned with ego development only as it relates to a professor’s professional functioning, as expressed in such aspects of his life as his career, his teaching, his view of students and colleagues, and his ideas about the nature of knowledge. One would expect, of course, some correlation between professional growth and ego development as more generally conceived. In fact, in a sub-sample of 30 professors from a medium size state university I found my scheme correlated .49* with the Loevinger Sentence Completion Test, a measure of ego development. A correlation of this order was exceeding one and preparing for the succeeding one. I believe the scheme I have presented is fully developmentally in this sense, except for one limitation: faculty members may be located at stages higher than the first or second with which they are familiar. In some cases there is evidence that they passed through these first stages when they were graduate students or even undergraduates. For example, in a number of interviews faculty gave retrospective accounts of their own development which seemed to match that described by the scheme.

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Faculty Development: A Stage Conception
—Continued

REFERENCES


"Faculty Development: A Stage Conception"

RESPONSE MEASURE ONE

Instructions

The purpose of this instrument is to measure the meaning that this article has for you.

Here’s how to use these scales:

If your impression of this article is very closely related to the adjective at one end of the scale, place your "X" as follows:

Fair X:__:__:__:__:__ Unfair

or

Fair __:__:__:__:__:__ X Unfair

If your impression of this article is quite closely related to one or the other ends of the scale, place your "X" as follows:

Timely __:__:__:__:__:__ Untimely

or

Timely __:__:__:__:__:__ X:__ Untimely

If your impression of this article seems only slightly related to one adjective rather than the other (but is not really neutral), place your "X" as follows:

Nice __:__:__:__:__:__ Awful

or

Nice __:__:__:__:__:__ X:__:__ Awful

The direction toward which you check, of course, depends upon which of the two ends of the scale seem most characteristic of your impressions of the article. If you consider that your impressions of this article are neutral on the scale because the scale is completely unrelated to your impression, place your "X" in the middle space.

Safe __:__:__:__:__:__ Dangerous

Important:
1) Place your check-marks in the middle of the spaces as illustrated above. Do not place them on the boundaries which are indicated by a "X".
2) Be sure that you check every scale. Do not omit any.
3) Never put more than one check-mark on a single scale.

Make each scale a separate and independent judgment. Don't look back at your previous response. It is your first impressions, the immediate "feelings" that we want to assess.

PLEASE TURN THIS PAGE OVER AND RESPOND TO THE SCALES.
"Faculty Development: A Stage Conception"

1. Successful _____________ Unsuccessful
2. Meaningful _____________ Meaningless
3. Important _____________ Unimportant
4. Useful _____________ Useless
5. Relevant _____________ Irrelevant
6. Concise _____________ Diffuse
7. Hard _____________ Soft
8. Strong _____________ Weak
9. Constrained _____________ Free
10. Convergent _____________ Divergent
11. Active _____________ Passive
12. Emotional _____________ Unemotional
13. Multiple _____________ Single
14. Complex _____________ Simple
15. Rational _____________ Intuitive
16. Cautious _____________ Rash
17. Interesting _____________ Uninteresting
18. Helpful _____________ Unhelpful
19. Objective _____________ Subjective
20. Scientific _____________ Unscientific
21. Personal _____________ Impersonal
22. Abstract _____________ Concrete
23. Precise _____________ Imprecise
24. Clear _____________ Vague
25. Biased _____________ Unbiased
26. Thinking _____________ Feeling

In the space below, please add any adjectives that you would use to describe this article.
"Faculty Development: A Stage Conception"

RESPONSE MEASURE TWO

Instructions

Please respond to the following questions about this article. Try to answer in as much detail as possible. If you need more space, continue your responses on a separate sheet of paper.

1. This article reflects one manner of examining an educational issue. Is this general way of thinking about and investigating a topic personally appealing to you? Why or Why not?

2. Assuming that you had the necessary background and training, would you feel comfortable approaching an issue in this manner?

3. In your opinion, does this article produce the type of knowledge that contributes to our understanding of education? Please explain.

PLEASE TURN THIS PAPER OVER AND CONTINUE
4. What did you like most about this article?

5. What did you like least about this article?

6. In as much detail as possible, describe your "image" of the person who wrote this article.
overcoming faculty resistance

Most faculty development projects, including our own in PIRIT, rest on certain optimistic assumptions: that teaching is an important—even noble—vocation; that the quality of teaching and learning on most campuses can and should be improved; that institutions can and should do more than they have done in the past to support excellence in teaching; and that careful and sustained attention to effective teaching and learning can become a force for the renewal of entire colleges and universities. But these assumptions frequently collide head on with what can only be described as rampant pessimism among college faculty. Part of this pessimism is directed at the idea of teaching improvement. The reasons offered for why “teaching could not be improved at our school” run the gamut from “the administration does not support good teaching” and “faculty are not interested in teaching” to “students we get here are not prepared for college level work” and “the reward structure emphasizes research rather than teaching.” Many individuals cite earlier unsuccessful efforts to improve teaching, and their memories fuel their cynicism. None of the sixteen institutions or individuals involved in our PIRIT activities were immune to such pessimistic views.

The concept of institutional renewal fares no better. Higher education is enveloped by the widespread loss of confidence in American institutions that has been made apparent by critical public opinion
polls, political campaigns against the very government the candidates hope to lead, and the rise of consumer groups that battle businesses, government agencies, and professional associations. As one young faculty member declared, nothing could be done to change things at his institution (and, by implication, at any other) because "about one third of the faculty were actively retired" and the whole place had a ring of "Malice in Wonderland" about it. Another bluntly confessed, "I don't have any faith in institutional change. You may be able to change individuals but not institutions." And more than one member of the project's advisory committee counseled me to set aside the whole issue of institutional renewal in favor of the more realistic goal of working to renew individuals. Even members of the campus teams, though captivated by the ideals of the project, had their doubts; sometimes they felt like voices crying in the wilderness, too small and too powerless to accomplish anything of significance.

Such resistance is widespread. For example, while in Brazil to discuss plans for a nationwide teaching improvement program with a group of faculty members and administrators from different Brazilian universities, I heard such familiar plaints as, "Universities emphasize research, not teaching." "Faculty don't talk about their teaching—it's a private act," and "Faculty don't work together because they are isolated from their colleagues in other departments."

Obviously, the doubt, pessimism, and cynicism expressed by so many people in so many different places need to be taken seriously. But liberal reformers frequently underestimate or ignore resistance and assume that their ideas will be embraced by others. As a result, they have unrealistic aspirations, expecting changes to be more massive and to appear more quickly than is reasonable and thereby setting themselves and their supporters up for inevitable failure. Our national landscape is strewn with social programs that were discarded when their realities did not measure up to their promises; such disappointing results can only lead to disillusionment and pessimism about the prospects of future reform.

Resistance is a concept that has proven useful in such different fields as the study of electricity and psychoanalysis. It is important, therefore, for would-be reformers to recognize resistance and to understand why it exists, in order to identify steps that can be taken to gain the support of those affected by a proposed change.

bases of resistance

Resistance to reaching reform is a widespread phenomenon, and its roots extend deeply into academic culture; it is not simply the
perversity of isolated individuals. Several underlying factors contribute to this resistance. First of all, graduate training rarely includes preparation for teaching roles. In fact, it has been said that professors get jobs by demonstrating that they have been taught, not that they can teach. Personnel policies in colleges and universities are often more concerned with applicants' degrees, the schools they attended, and the professors with whom they have studied than with their teaching competencies. Faced with this attitude, teaching candidates would naturally attach greater importance to beefing up their credentials than to polishing their teaching skills.

Secondly, once hired and consigned to specific departments, faculty members' intellectual interests are expected to be limited to their own disciplines, or worse, to specializations within them. Forays outside of these confines are generally met with charges of dilettantism. In such an environment, faculty members often feel cut off from intellectual and sometimes social contact with colleagues in other departments, and they frequently experience a constriction of emotion because of this narrowing of interests.

The reward structure at many institutions is a third source of resistance to teaching reform. Unfortunately, the surest route to advancement for faculty is seldom through effective teaching; research and publication are major faculty responsibilities at many institutions. Service to the institution ("helps hold this place together"), personality traits ("never makes waves"), institutional politics ("who you know"), and seniority independent of any merit whatsoever ("how many years has he or she been at this step on the salary ladder?") are also factors that often count more than effective teaching in promotion, tenure, and salary decisions. Besides, little rigorous and systematic evaluation of faculty performance is generally available. Student ratings are now used by many faculty in analyzing their own teaching, but often on a voluntary, periodic, and somewhat haphazard basis. Thus, neither the individual teachers nor the colleges know to what extent their teaching is effective.

"Academic folklore" also militates against efforts to improve teaching. For instance, conventional wisdom holds that a teacher is born and not made, implying that little can be done to increase one's teaching competence (although almost all faculty members can point to important lessons they have learned through their teaching experiences). And the claim that teaching is an art, not a science has become interwoven with the concept of academic freedom. Faculty have come to believe that a professor's classroom is his castle, and many find it somehow unprofessional for one faculty member to criticize, offer suggestions, or even observe another in the classroom. As one person declared, "Teaching has replaced sex as a taboo topic."
Another product of this academic folklore is the assumption that the person who knows the most about a subject is the best qualified teacher of it. Thus, universities seek to ensure effective instruction by hiring the best authority in each field. Unfortunately, however, the idea that a university should hire good people and then get out of their way justifies a "do nothing" attitude after the faculty are hired. Whether or not this kind of thinking was useful in years past, it is clearly inadequate for a future when few new faculty will be hired, mobility will be reduced, and faculty will look to their institutions for assistance with their professional development.

There was, and is, a logic to these customs; it rests on the assumptions that knowledge of the subject is the basic ingredient in effective teaching and that it is more important than the teacher, the student, the instructional procedures used, and the college environment. Traditional faculty development procedures—taking sabbatical leaves, attending professional conferences, acquiring research support, or assistance for completing advanced degrees—are designed to update, upgrade, or expand the range of a professor's knowledge. These facets of faculty development have become so important that, until very recently, little attention has been given to developing other aspects of faculty life or of the educational process.

A more recent factor contributing to faculty resistance is the academic recession that has plagued higher education throughout the 1970s. In contrast to the period of uninterrupted growth in faculty salaries, prestige, and the number of available faculty positions that characterized the decades following World War II, recent years have seen a basic demographic shift toward a plateau in student enrollments and a movement of funding priorities away from higher education that has caused a freeze, and in some cases a decline, in the number of faculty positions. This has resulted in the widespread awareness among faculty that it is increasingly difficult for a scholar to get a job, change jobs, or even get tenure at his own institution. Faculty mobility has declined, and many are now facing uncertain futures with little hope of improving their lot, as their predecessors did, by moving to better jobs elsewhere.

Furthermore, new and more diverse student populations challenge the values and styles of traditional teaching. Minority students, adult students, students with learning deficiencies, and students with vocational goals rather than more intrinsic interests in learning are more common today. Faculty view these changes with trepidation and uncertainty. "How do you teach students who don't know how to think?" they ask.

Trends toward greater accountability, unionization, public
control, and bureaucratization all have encroached on faculty autonomy, and many individuals feel they are losing control over their institutions and their lives. Some faculty have become contentious, and their attention has been diverted from students and teaching as they sharpen their survival skills, looking out for "number one" and fighting to preserve departmental budgets and positions in these leaner times. Such problems naturally take on different complexions at different institutions and in different parts of institutions, but each contributes to the sense of harassment that has turned faculty interest away from exploring improved or innovative teaching.

Faculty resistance, then, to the idea of teaching improvement is understandable. A number of fairly predictable faculty responses can be expected when faculty development or teaching improvement is first discussed. "Who says I need to develop professionally? Who says I need to improve my teaching?" are typical reactions. Some individuals fear that they may reveal their own weaknesses or that if colleagues see them in teaching situations they will use unfavorable performances against them. Many feel that attending seminars or workshops on different aspects of teaching would be a waste of time. Some are suspicious of the motives of faculty development organizers or leaders: "What are they really trying to tell me by inviting me to participate in a teaching improvement activity?" Still others think proponents of teaching improvement might pressure them to use some particular methods or techniques and thereby limit their own autonomy.

Resistance to efforts to improve teaching has roots deep in the academic world. As all of us who are a part of that world know, such resistance is deeply embedded in our traditions, in our institutions, and in ourselves. Anyone embarking on the road to teaching improvement should anticipate resistance not only from his colleagues and his institution, but from his fellow reformers and himself as well.

what approach?

In view of this pervasive and deep-seated faculty resistance to teaching improvement, what approach should a faculty-dominated campus team take in developing a program for improving teaching throughout an institution? This question caused the project teams considerable worry; they soon discovered that approaches familiar to them simply would not work in this situation.

Individualistic. Faculty members acting independently and usually privately may review their courses, talk with a few students, or analyze particularly high or low points in certain classes, but such an approach to teaching improvement does not constitute an institutional
program. Furthermore, as one dean pointed out, this individualistic approach contributes to the "mystery cult" that has enshrouded college level teaching—the notion that one must acquire the essentials of the craft on one's own in some inexplicable way rather than learn from others in a public forum. This approach to improvement can be compared to typical modernization efforts in a developing country: peasants tend to seek improvement in their living conditions by working harder in traditional ways rather than by learning modern alternatives and adopting new techniques that can both improve their conditions and make their work easier.

Political. The political approach is the one most commonly used in making changes at a college or university. A group of faculty members, administrators, and/or students identify a problem; they meet, usually with a university committee that is responsible for that problem area; and they formulate a proposal. If it garners enough political support, the proposal is eventually approved and someone with formal responsibility, usually an administrator, sees that it is carried out. Although the results are often uncertain and the steps along the way are frustrating, time-consuming, and even distasteful to some, this process has proven very effective in some situations. However, the political approach is not appropriate for creating a teaching improvement program. No constituency has enough political clout to push such a program through. In addition, there is seldom a ground swell of interest in teaching improvement among faculty; any such action by an administrator without their support or leadership would be seen as unacceptable unilateral action or as an attempt to impose administrative will upon the faculty. Reactions to such attempts might well generate a backlash against the very idea of a teaching improvement program even before it has received a fair hearing.

Educational Research. Another approach, less familiar to faculty and students but fairly common among reformers in higher education, involves educational research. In educational research, a scholar identifies several problems, gathers information from knowledgeable individuals about those problems, analyzes the available data, reports the results (usually with recommendations for action) to groups within the institution, and expects improvements to be made in the problem situations. There are two serious drawbacks to this approach. First, the results may give an accurate picture of the resistance but a false picture of the prospects for improvement. For instance, when K. Patricia Cross surveyed the faculty at the University of Nebraska, she found "a pessimistic, if not hostile, environment for instructional reform" (1977, p. 12). She thought the faculty exhibited "smug self-satisfaction" about the quality of their own teaching, saw no
need for improvement, resisted the evaluation of teaching, and disagreed about how to go about it. This was no doubt an accurate picture of the majority of the faculty, but sizable numbers did indicate interest in improvement and support specific proposals for change. These are precisely the people who need to be, but often are not, identified and engaged in fashioning improvements in teaching; even outstanding researchers like Cross often neglect valuable pockets of interest and reinforce the pessimistic view that little can be done to improve things.

The second major limitation of the research approach is that scholars tend to adopt an overly rational view of individual and institutional change. They tend to think that if they conduct sound research, analyze the data carefully, and report their findings cogently and interestingly then steps will be taken to resolve the documented problems. They may be forgiven such naive and simplistic assumptions, since this kind of liberal, scientific humanism pervades much of modern scholarship. But it is obvious to any student of social change that research, by itself, is not sufficient to change conditions. Alexander Astin (1976), a leading scholar, analyzed a massive effort he directed to gather student research data and report it back to many colleges and universities for the purpose of making improvements. He concluded that institutions are far more resistant than he initially assumed: "Institutional conservatism derives from the interplay of at least three factors: the structure and function of institutions, the traditional role and personal dispositions of administrators and faculty, and external social demands. Of these, faculty are by far the most important" (p. 125). He identified many psychological devices used by faculty to scuttle proposed changes—rationalizing negative research findings, postponing action until after further study, obfuscating the issues—but, unfortunately, he gave few suggestions about how to overcome such methods and gain support for research-based proposals. Such mechanisms helped faculty to preserve the status quo.

Organic Change. The PIRIT project employed an approach to teaching improvement based on the concept of organic change. An organic change approach incorporates many features. First, it involves a positive outlook, thinking about how things might be made better rather than finding reasons why they cannot. By persistently accenting the positive and emphasizing the possibility that some improvement may be made—even in the face of all the difficulties—some change can indeed be accomplished.

Second, organic change is action-oriented. It involves thinking, talking, and debating, of course, but these must culminate in a plan of action and lead to specific steps to carry it out. Faculty are trained to
analyze, criticize, and discuss, and, fortunately, they usually delight in these endeavors. But such tendencies can facilitate change only if the need to integrate ideas into concrete change proposals is constantly kept in mind. The need to act, we found, usually led to compromises and the creation of a working consensus that was impossible while matters remained on a verbal level.

Third, organic change also involves rooting a program in the lives of individuals and the realities of the institution. Faculty often become enmeshed in abstract discussions of educational issues not clearly related to their lives and their classes. Reforms affecting teachers and teaching can succeed only if individual faculty members examine their own activities in specific courses and instructional situations and experiment with alternatives that they see as promising. Continual efforts to make discussions concrete and personal can foster specific changes in the instructional attitudes and behaviors of different individuals.

Fourth, organic change means starting with a nucleus of individuals who are motivated enough to give their own time and energy to providing leadership for a promising, if not popular, enterprise. Actively involving large numbers is not necessary, at least at the outset, if one opts for a process of organic change. Indeed, large numbers may be counterproductive at first, since emerging programs are not capable of responding to large numbers of requests and needs.

Fifth, organic change is evolutionary, not revolutionary. The term institutional renewal implies massive and instantaneous changes in the character of a college or university. However, such changes, at least in the history of American higher education, have been rare and, more often than not, somewhat fleeting: the surest route to enduring change is through a series of short steps that follow each other and that extend several years into the future in a process of organic change.

Sixth, organic change uses a low profile strategy to build support without increasing resistance, that is, it concentrates on doing a few things and doing them well. If a few activities of a developing program can be carefully chosen and planned so that participants learn useful things and enjoy themselves, they will become advocates of that program. It may also help to get off on the right foot by choosing successful, if not spectacular, initial activities. In addition, a low profile strategy that promises little but delivers much helps to avoid antagonizing potential critics.

This approach acknowledges resistance yet staunchly contends that change and improvement are possible. It involves working with those least resistant, encouraging their needs and interests to surface, and enticing them to help plan and engage in new and profitable
experiences. By sharing with their colleagues both their experiences and their feelings about better ways of living and teaching, they can help overcome any hesitations they may have. But there are, of course, pitfalls in the organic change approach. It is slow, and there are many ways the process may be tripped up. For example, key individuals may refuse their support, or other events may distract attention, time, and energy from this process. It is, however, a steady, humanistic and educational approach that can, over the long run, firmly implant a formal program of teaching improvement within an institution despite initial resistance.

The process of organic change had a special advantage for the kinds of goals we sought. Not only was it a way to establish a program for teaching improvement, but the process itself became a renewing influence throughout the institution. The stress on designing programs around the character and needs of the institution brought many individuals from various parts of the institution together around the one concern that most have in common—excellence in teaching. Faculty members were encouraged to meet colleagues from other parts of the institution, to discuss topics that were seldom discussed, and to support each other in exploring ways to improve their institution. In this way, institutional renewal joined with teaching improvement as a goal of the organic change approach. Thus we hoped to foster renewed interest in both the professors and their institutions for the central reason for their existence—providing the best instruction for their students.

When I talk with others about professional development, they frequently ask, "What should we do to improve teaching at our school? Can you help us save time by not having to reinvent the wheel?" My response invariably is yes, there are activities, materials, and strategies they can learn from others. But the most important thing we have learned is that the organic approach, in which individuals find their own route to teaching improvement and institutional renewal, is vital. It necessarily involves reinventing some wheels, but these are hand-tooled wheels that nobody else can invent for them. People will, of course, make some mistakes when they try something unfamiliar, but that is a necessary and challenging part of the renewal process.

implementing the organic approach

Based on our experience, several steps appear to be particularly important in launching organic institutional renewal and teaching improvement programs.

Finding Directions. Any group charged with developing an institution-wide plan to improve teaching invariably needs to get infor-
mation from sources beyond itself. Such information can provide broader perspectives than the group members have as individuals, and it can suggest the directions their planning must take as well. Since the well-being of the faculty and the nature of their teaching is intimately tied to the character of their institutions, our teams were urged to analyze their institutions as a first step in finding clues about the directions their teaching improvement programs should take. The team from Fisk University, for instance, had entered the project when Fisk was in the midst of a serious retrenchment. Its faculty had been reduced from about 120 to 80; those that remained suffered a 20 percent pay cut while inflation raged at a 10 percent rate. The Board of Overseers mandated several drastic changes: it collapsed its several departments into three divisions, created a new curriculum that included more interdisciplinary work, and declared that no raises would be given until a new evaluation system was established to ensure fairness and impartiality. This latter task fell to the campus project team. In addition, since they wanted to provide assistance for faculty as they were learning new roles, the team decided to incorporate a development component into the evaluation scheme. Other colleges and universities faced different circumstances, of course, but each institutional analysis suggested certain directions the faculty development program could take to enlist faculty support and cut through their resistance.

But the teams were still a long way from learning about the needs and interests of individual faculty, whose active involvement was essential for any successful program. These needs were assessed by means of faculty interview, faculty questionnaire, and student questionnaire studies. Each of these yielded different insights and suggested different means for gaining faculty support.

Faculty Interviews. The faculty interviews served several purposes. First, they enabled the team members to find out what others thought about teaching and learning issues and about the institutional barriers and support which they had encountered in the past. Second, they engaged individuals on each campus in substantive dialogues about teaching and its improvement (which involved studying and conducting faculty development simultaneously). And third, they allowed team members to establish personal contact with other faculty members who could be enlisted to participate in future teaching improvement activities. The form devised for these interviews consisted of such questions as: Why did you decide to become a college professor? What was the most important thing you had to learn when you first started teaching? What would you like to accomplish in the next five to ten years? Do you feel that you and your teaching practices are supported
and rewarded by the institution? What do you think is the most important change that could be made to improve the quality of education of this school? Each faculty member on the team was asked to interview five persons so that a range of individuals could be reached without undue burden on any one interviewer.

Unfortunately, most faculty members had never conducted interviews such as these. Some mistakenly thought interviewing was the province of experts in arcane provinces of social science, or worse, psychiatric practice—certainly not a task for respectable academics of other persuasions. Thus a set of general guidelines and practical tips for conducting interviews and recording responses was prepared. Armed with these instructions, small groups of faculty members on the project campuses began to talk with their colleagues about teaching, learning, and institutional change. From these conversations they not only gleaned information useful for their planning, but also discovered that interviews were a powerful tool for understanding their colleagues and their institution and that interviewing could actually be enjoyable.

Those who were interviewed benefited as well. As we were to learn from our questionnaire (which will be discussed next), this was the first time that anyone had talked to many of the faculty in detail about their own teaching. It was a noteworthy occasion. The content was important, but perhaps even more important was the fact that faculty members had been approached by a colleague in a direct and personal fashion to discuss their views and experiences and to obtain suggestions for improvement. Few people could resist the opportunity to talk about themselves and to contribute their ideas to a developing program for the improvement of teaching.

Though the interviews were useful in many ways, some persons were concerned that only a small proportion of the entire faculty was sampled, particularly in the large schools. In order to survey a larger number of faculty, a questionnaire was devised, distributed, and completed by 1,680 persons from 14 institutions. Among the respondents, 42 percent reported that never during their entire career had anyone ". . . talked with [them] in detail about [their] teaching and helped [them] to clarify [their] course objectives, devise effective student evaluation, or develop a more effective approach for certain kinds of students." Only 25 percent said this had happened more than twice. Another 37 percent said that since coming to this institution they had not ". . . attended a conference or workshop concerned specifically with effective teaching and learning, either on or off campus." An additional 34 percent said they had attended one or two. Only 29 percent had attended several such sessions. Further questioning revealed that 40 percent agreed either somewhat or strongly with the statement,
“Knowledge in my field is expanding so fast that I have fallen behind.” And 30 percent acknowledged that, “teaching is not as much fun as it once was.”

Each of these responses can be viewed as evidence of resistance. From an organic change perspective, however, they can also be viewed as pleas for assistance. For example, if three out of four faculty members have not talked in detail about their teaching, that may be read as confirmation of resistance. However, if these persons have not shared their ideas, problems, uncertainties, or accomplishments with a professional colleague, it is certain that there is a great deal of experience and feeling dammed up behind all those years of silence. Given the right rationale and context, many “resistant” faculty members would be willing to unburden themselves, as was proven by our experience with the interviews. It is no accident that subsequent activities that gave faculty members an opportunity to share their feelings and ideas with colleagues attracted many participants and met with primarily positive response.

Obviously, not everyone values the same things, and certainly these written responses were not equivalent to a commitment to participate in any specific activity. Further, there was much variation from campus to campus: some had serious morale problems, while at other department chairpersons provided little encouragement for experimentation with new courses or new teaching methods. But the specific responses obtained at different institutions were useful in pointing to specific directions for improvement, particularly in comparison with the total results.

Student Survey. This information about the faculty is valuable, but it represents only one perspective on these matters. If teaching is viewed as merely a faculty activity, the faculty perspective would be sufficient; but if learning is deemed an important outcome of teaching, then student views also need to be considered. The student questionnaire survey conducted precisely for this purpose was completed by 3,442 students in 16 institutions; about half of these were freshmen and 40 percent were seniors. From the responses of this large but not necessarily random sample we learned that the factors the students regarded as most important to their overall personal and intellectual development at college were: course work in field of major interest (75 percent); living away from home (55 percent); reading on one’s own (55 percent); and “bull sessions” with fellow students (62 percent). It is interesting that only one of these factors has anything to do with the formal instruction at the college. Surprisingly, only 21 percent regarded introductory surveys of various disciplines as either important or very important. Considering that such surveys constitute the primary mechanism to ensure that students acquire a broad general education,
this rating, the lowest of thirteen possible alternatives, suggests several directions for teaching improvement, particularly in curriculums affecting students during their freshman and sophomore years. In response to further questioning, only 51 percent said that the majority of the faculty at their institutions were effective and stimulating teachers; 47 percent reported over half were genuinely interested in the academic progress of students; and 29 percent said more than half were genuinely interested in the development of students beyond the classroom. These data indicate problems either with the faculty and their teaching or with the ways they communicate their interest and their effectiveness to students.

Other items on the student questionnaire revealed responses comparable to those obtained from the faculty, and the comparison affords rich insights. For example, when asked to indicate the importance they placed on helping students achieve various kinds of competencies, 78 percent of the faculty said they attached much or great importance to learning to critically analyze ideas or issues; however, only 27 percent of the students said that the majority of their class time was spent on such activities. Similar disparities between faculty goals and student experiences may be found in regard to such categories as thinking in creative or original ways and examining value implications of factual material. Evidence suggests that additional attention needs to be given to the teaching of these higher level intellectual abilities if faculty are to realize their own instructional aspirations. Further, over three quarters of both students and faculty favored a teaching and learning style marked by intellectual challenge. But 84 percent of the students rated another item in the top two categories of importance: “I function best when I am clear about exactly what is expected of me, material is presented in a well-organized way, and I know precisely what I need to study for an examination.” Only 56 percent of the faculty gave comparable weight to the importance of clarity in their own teaching. Similarly, 75 percent of the students said, “I respond best to a teacher who makes the course interesting by using stories, examples, anecdotes, or humor,” but only 27 percent of the faculty admitted to trying to stimulate student interest with such techniques (although the wording of the faculty item may have influenced the response; it included reference to a “ham actor,” a phrase likely to inhibit all but the most thoroughgoing hams).

**results of the organic approach**

The point of all this is not that program planners should rush out and do everything that students say they want, but that evidence points toward several alternative ways to plan and to gain support for
an evolving teaching improvement program. There are needs, and there are activities one can think of, without straining the imagination, that would be responsive to the educational interests of both faculty and students. The survey results, coupled with the institutional analyses and faculty interviews, pointed to ways to serve a variety of faculty interests even in the face of resistance to the improvement of teaching. Campus teams that had used these methods could not only tailor their first events around the interests they had uncovered, but they could personally invite one or more colleagues to continue the conversations that they had begun in the interviews. The team from the University of Southern Mississippi, for instance, invited about fifty colleagues to a two-day retreat at their Gulf Park campus for a workshop on teaching and learning styles, and virtually everyone agreed to participate. The exceedingly positive evaluation of the weekend both surprised and elated the group. Similarly, the large turnout for the fall forum at St. Mary’s College, which for the first time was planned as a workshop on teaching, was regarded as very successful by all who attended.

A whole program could evolve from the unfinished business following such a successful first activity and from the interests that it generated. Several institution-wide programs were the natural result of this organic approach. For instance, a Human Resources Center evolved at Loyola University, and a Center for Instructional Development came into being at Old Dominion University. Indeed, the grass roots support for the various activities sponsored by these new structures justified the allocation of staff and budget even in financially difficult times. And, as another example, more than forty faculty at the University of Evansville, about a quarter of the total, agreed to teach in a new values seminar for freshmen—most volunteering to attend Sunday evening sessions for discussion of value issues among themselves; following the favorable evaluation of the course, it was natural to incorporate it as part of the general education program. These and other programs were the fruits of the organic approach to overcoming faculty resistance and are well on their way to becoming institutionalized.

A final insight about resistance was revealed by the final evaluation. A total of 442 faculty who did not participate in the campus faculty development programs were queried and asked for their reasons. Fully 28 percent said simply, “I was not asked.” This reason was given more often than any other except “other commitments had priority.” We found this a curious response, since more than four out of five acknowledged that they had received formal announcements, such as memos and notices of activities, which invariably invited faculty to participate. This suggests that formal announcements and invitations alone are not sufficient to overcome resistance, but it also indicates
that resistance, at least for many, is not such an emotionally loaded phenomenon as we had initially thought; it may be overcome to some extent by the specific and personal invitation of a colleague to join in some activity. Resistance is real, but an organic change approach that suggests directions through careful analyses of institutions as well as of faculty and student views can lead to activities and to whole programs concerned with teaching improvement. Once established, such programs can evolve in many directions and reach into all parts of an institution with their renewing influence.

references

Overcoming Faculty Resistance

RESPONSE MEASURE ONE

Instructions

The purpose of this instrument is to measure the meaning that this article has for you.

Here's how to use these scales:

If your impression of this article is very closely related to the adjective at one end of the scale, place your "X" as follows:

Fair X:____:____:____:____ Unfair

or

Fair :____:____:____:____ X Unfair

If your impression of this article is quite closely related to one or the other ends of the scale, place your "X" as follows:

Timely :____:____:____:____ Untimely

or

Timely :____:____:____:____ X:____ Untimely

If your impression of this article seems only slightly related to one adjective rather than the other (but is not really neutral), place your "X" as follows:

Nice :____:____:____:____ Awful

or

Nice :____:____:____:____ X:____ Awful

The direction toward which you check, of course, depends upon which of the two ends of the scale seem most characteristic of your impressions of the article. If you consider that your impressions of this article are neutral on the scale because the scale is completely unrelated to your impression, place your "X" in the middle space:

Safe :____:____:____:____ Dangerous

Important: 1) Place your check-marks in the middle of the spaces as illustrated above. Do not place them on the boundaries which are indicated by a ":".
2) Be sure that you check every scale. Do not omit any.
3) Never put more than one check-mark on a single scale.

Make each scale a separate and independent judgment. Don't look back at your previous response. It is your first impressions, the immediate "feelings" that we want to assess.

PLEASE TURN THIS PAGE OVER AND RESPOND TO THE SCALES
"Overcoming Faculty Resistance"

1. Successful ____________ Unsuccessful
2. Meaningful ____________ Meaningless
3. Important ____________ Unimportant
4. Useful ____________ Useless
5. Relevant ____________ Irrelevant
6. Concise ____________ Diffuse
7. Hard ____________ Soft
8. Strong ____________ Weak
9. Constrained ____________ Free
10. Convergent ____________ Divergent
11. Active ____________ Passive
12. Emotional ____________ Unemotional
13. Multiple ____________ Single
14. Complex ____________ Simple
15. Rational ____________ Intuitive
16. Cautious ____________ Rash
17. Interesting ____________ Uninteresting
18. Helpful ____________ Unhelpful
19. Objective ____________ Subjective
20. Scientific ____________ Unscientific
21. Personal ____________ Impersonal
22. Abstract ____________ Concrete
23. Precise ____________ Imprecise
24. Clear ____________ Vague
25. Biased ____________ Unbiased
26. Thinking ____________ Feeling

In the space below, please add any adjectives that you would use to describe this article.
"Overcoming Faculty Resistance"

RESPONSE MEASURE TWO

Instructions

Please respond to the following questions about this article. Try to answer in as much detail as possible. If you need more space, continue your responses on a separate sheet of paper.

1. This article reflects one manner of examining an educational issue. Is this general way of thinking about and investigating a topic personally appealing to you? Why or why not?

2. Assuming that you had the necessary background and training, would you feel comfortable approaching an issue in this manner?

3. In your opinion, does this article produce the type of knowledge that contributes to our understanding of education? Please explain.

PLEASE TURN THIS PAPER OVER AND CONTINUE
4. What did you like most about this article?

5. What did you like least about this article?

6. In as much detail as possible, describe your "image" of the person who wrote this article.
One Teacher’s Quest for Liberation

One of the occupational hazards of college teaching is the effort to become a better teacher is as likely to leave you feeling wretched as rewarded. Consider the experience of Henry F. Ottinger, whose "parting words" to a freshman English class appeared on the July 22, 1971, Op Ed page of the New York Times:

As you know, I began the semester in a way that departed from the manner in which I had taught composition classes in the past. Much of my attitude at that time was influenced by Faber’s book, The Student as Nigger. On the first day of class, I read to you the following:

"School is where you let the dying society put its trip on you. Our schools may seem useful...but they’re poisonous as well... Our schools teach you by pushing you around...by making timid, apathetic slaves of you—authority addicts."

That sounded like a breath of fresh air all back in February—and I suggested that we try to break the mold... You seemed to agree...

As you know, things went from initial ecstasy to final catastrophe. And recently I fell back—so, you forced me back—into assigning general topics. As a result of that action, and a lot of other factors, this semester has been the worst I have ever taught. In fact, I even debated with myself whether or not to go on teaching next year.

Generally, this class has been the most silent, reticent, paranoid bunch of people I have ever encountered.

You had an opportunity to exchange ideas... and you were too embarrassed to do so.

You had an opportunity to find out something about yourselves... And as far as I can see, you found out very little.

Most of all, you had the opportunity to be free—free from the usual absurdities of a composition class... free to be responsible to yourselves—and you succeeded in proving to me that freedom is slavery...

In short, why did the class fail? It failed because thinking causes pain. It’s so much easier to come up with instant aesthetics, instant solutions, instant thoughts...

One of the most nauseating remarks I have heard this semester is, “Gosh, college is no fun!”

If you don’t believe that knowledge for its own sake is a valid and valuable goal, then you’re in the wrong place, and you’d do much better in a vocational school, studying how to be a plumber or a beautician.

Granted, there are problems within the university itself—serious problems—that, despite what you may think, show some sign of possible solution. One step they could take but probably won’t is to limit enrollment and keep the 45 percent of you out who don’t belong here because it’s no fun...

Last, I will bid a good-by (until the final and
say that at any time some sly hint, or else, or (god forbid) a half-truth slipped out of my uncon- scious...and (pardon the expression) "turned one of you on," then we have not failed you and I.... I love you for what you might be. I’m deeply dis- turbed by what you are.

Ottinger’s "case" is not unique among college teachers who teach introductory or required courses. The idealism and the disillusionment, the caring and the hurt, the sense of failure and the need to blame, the human concern—and the seemingly hopeless human obstacles—are all familiar to those of us who teach undergraduates.

Ottinger’s ordeal is reflected in my colleague in the French department, who loves the language he teaches and tries to "make it interesting," but who must face semester after semester the roomfuls of students sweating out their language requirement. It is there in my own memories as a teaching assistant in English, when a poem or story I really liked and wanted desperately to share with my students met only stony silence or embarrassed fidgeting. Whatever the causes of this kind of classroom failure and wherever the blame lies, it is a painful, damaging thing for a teacher to have to go through. And many of us do have to go through it.

The feeling is one of being trapped. Pushing us from behind are familiar pressures: the need to finish a dissertation, or maintain stature within a discipline, or win promotion in a department or to succeed at teaching itself. In front of us are our students: students who are there because they want to learn, because they are fulfilling a requirement or because somebody said we were "good" or "an easy B." Identifying and coming to terms with their often incompatible sets of goals can be overwhelming.

But there are other pressures, too, coming from all sides: rivalries and power struggles within our department, anxieties about whether we really "belong" in our own or any college—or the crazy quilt of higher education itself: the turmoil, the inertia. The classroom is often where we find ourselves most vulnerable, most exposed and at the same time most confined. Even as we try to represent our disciplines, we are vulnerable to the charge of not being "relevant" or presenting ideas that don't "turn on" our students. This, on top of the crises and pressures we face, is insult added to injury. It’s part of the condition of being trapped. If we do indeed enjoy academic freedom on our campuses, it doesn’t seem to be helping us in the classroom, where we need it most. We feel anything but "free."

"Academic freedom," writes Sidney Hook, is "the right of professionally qualified persons to inquire, discover, publish, and teach the truth as they see it in the field of their competence." Period. That’s how most colleges interpret it (though it’s generally extended to allow tenure faculty to say "unpopular things" outside their "competence" from time to time). But the freedom we as teachers crave goes deeper and usually remains silent within us. We seek freedom from a sense of powerlessness, from being manipulated by pressures inside and outside the classroom. And academic freedom is meaningless so long as we feel confined by personal and professional restraints—in our colleges and in our heads—that categorize, objectify, isolate and depress us.

The very process of getting certified to teach on the college level has taken its toll among those who stand with their PhDs, greatly diminished in spirit from when they began graduate study. Someone I know actually boasts that getting the degree "did permanent damage to my personality." Another colleague was harassed and humiliated as an instructor because his thesis wasn’t finished. A third was lucky to find an "easy doctoral program" and so "got the damned thing out of the way in two years." One wonders what happens to teachers in the making as they pass through the ordeal by thesis. Are they the same human beings as when they began the certification process? What ever happened on the way to the forum?

Forget the ivory tower. College teachers, like other Americans, live in a world often ugly and menacing. We have felt the ravages of Vietnam: we face an uncertain job market; glutted with hungry PhDs; we too wake up one morning to find our local supermarket selling "pure" water in half-gallon jugs. And yet the "dignity of our profession," the role we are supposed to play in carrying forward the accumulated wisdom of Western man, denies us the opportunity to deal in any organic sense with the question of human survival—including our own.

The academic community demands of our students and ourselves not that we find strategies for survival but that we specialize and "excel" in the various intellectual endeavors called disciplines. The attempt to get in touch with our own lives gets blocked by demands for instrumental performance: completing requirements, preparing for graduate school, finishing the PhD, nailing down that promotion. We hear the cautious scholastic within us whisper: "Take it easy. Find some little problem you can work on in a nice, neat way. Fill your own niche. Leave the world alone."

We’re encouraged, of course, to inquire, to speculate, to hypothesize to our heart’s content—but not to organize, to politicize or to act on behalf of the greater human concerns. However deeply they may affect us. And we face similar inhibitions when it comes to relations with others: the art of curing for somebody, of reaching out to a student or colleague.
In trouble. We are allowed to do these things, even praised for our concern; but somehow that concern is not what our profession is about. Promotions are not usually won on the basis of "superior performance as a human being."

I suspect, finally, that much of what we are as teachers is determined by the quality of life we lead as adults. If we feel besieged by personal anxieties about career or family, by unexpressed longings for more vitality and spontaneity in our lives, we inevitably infect our personal predicament, our joylessness, on our students. Unspoken disappointments resound in our messages to them, and they then retreat into passivity. One anxiety nurtures another, until we begin to anticipate being repudiated or conved by our students. The restraints we learn to live with become rationales for demanding uniformity, obedience, adherence even to rules and standards that reduce learning options.

The major reason given by those who have been unable to make teaching a creative, fulfilling process is that "the system just doesn't encourage that kind of teaching."

The system, in this case, resembles an institutional octopus whose victims feel strangled in at least six ways:

- By a reward system which encourages you to develop yourself in an instrumental and specialized role, and which acknowledges only those facets of your creativity in which you are "expert" and publishable.
- By a social caste system, maintained by the "influential" members of your department, which either embraces or excludes you (depending often on your sex, race, politics or life style); which plays a large role in your chances for promotion and tenure and can serve to inhibit your contact with "noninfluential" people—like students.
- By a departmental seniority system that permits established faculty to monopolize whole academic areas; by the compartmentalization of academic knowledge, which locks you into your department and inhibits inter-disciplinary cooperation.
- By the system of college and departmental requirements that insures that many of your students sit there under compulsion, and a grading system that makes you Rudder: Punisher of student learning performance and structures your course to fit the final exam.
- By the sense of alienation, the dearth of collaborative learning among students and faculty, the feeling of being entirely on your own to succeed or fail in academia.
- Finally, by the bureaucratization of the university, the lack of spontaneity, of intellectual diversity, of cultural richness; by the noncommunity of a university captive to its own corporate complexity.

The point is not that each of us has been disillusioned or paralyzed by all these "tentacles." We develop little strategies for getting around certain re-strains that might otherwise cripple us. And the system obliges. We cheat the system by sneaking a little poetry into a rigid freshman Comp syllabus, by permitting students to grade themselves or by giving credit to a student spending spring semester in a commune, whether he writes his term paper or not. Academic loopholes allow us to teach what we "really want to teach" and get away with it. In the most "dehumanized" university setting we still find a few real friends among fellow teachers and favorite students.

The system is full of such exceptions: token radicals, token women and blacks, the teacher who did get promoted without his PhD, various heretics and oddballs. The university is proud of them. It is these exceptions who provide continual reassurance that academic freedom does exist.

But as teachers we often receive a different version: Go into your own classroom, shut the door and do whatever you want (except giving everybody an A)—and that's academic freedom. Speak your mind.

Get attacked in the local newspaper—preferably not while the state legislature is in session—and that, too, is academic freedom. So the ultimate irony is that the only freedom granted us is the freedom to cheat the system—not change it.

It seems we must look beyond academic freedom if we are to resolve these contradictions in our lives. We must be liberated before we can make academic freedom work for us.

A teacher's liberation begins with the right to care and to act upon his or her human concerns as part of his or her pedagogy: not merely as an extracurricular activity. It means rejecting the sacrifice of feeling to "professional objectivity," or the isolation of the mind within a "field of incompetence." Liberation sanctions the political act of uniting with others who share our passions and ideas. My real freedom as a teacher awaits upon my liberation.

The liberation of anybody—blacks, women, students, teachers—usually requires three phases. The first is consciousness-raising concerning one's social environment. The second involves expanding one's vision of personal and professional options. The third is developing the ability and selling the occasion to act on behalf of one's ideals. In practice, they may occur simultaneously and reinforce each other. But each is worth examining in itself.

Paulo Freire, who directed the adult literacy campaign in Brazil before he was exiled, writes: "Every educational practice implies a concept of man and the world.... All educational practice implies a theoretical stance on the educator's part. This stance implies—sometimes more, sometimes less explicitly—an interpretation of man and the world."
Everywhere we do in the classroom, every action the university undertakes in the name of education, bears witness to the way we view people and society, both as they are and as they might be.

When we overhear a frustrated colleague complain, with Ottinger, "Half these kids have no business being in college at all." in effect he is implying that higher education should continue to serve only those who "deserve it," only those who appreciate "learning for its own sake." When the university adopts a policy of actively recruiting working people, housewives and disadvantaged students, there is usually some recognition, beyond the pursuit of federal grants, of a new role for higher education in affecting social change. When an experimental program or a proposal to eliminate requirements is attacked because it endangers educational "standards," we compromise "the integrity of the degree." A great deal is implied about our educational priorities, our focus of values.

I hear the "humble" pedagogue confess: "If I can reach but three or four in a class of forty, I'm satisfied." and I wonder what room there is in his educational philosophy for the other thirty-seven. I know a dean who would like to abolish general education requirements and allow students to choose their own curricula but who feels they're "not mature enough to handle that freedom in a responsible manner." The implied concept, I suppose, is that students gain maturity by obeying rules and letting other people tell them what to learn. I have myself been advised to "play the game, get your PhD, be a good boy until you get tenure—and then go and do whatever the hell you want to," with my "adviser" ignoring the implications of that pathway to security.

But if we fail to take the time or find the courage to search out and scrutinize our educational practices and their underlying philosophies, we make ourselves and our students victims of negligence. Unless we acknowledge the implied concepts, the spoken and unspoken strategies, that operate in our classrooms, departments and colleges (and most of us do refuse), we risk indictment on grounds of intellectual dishonesty—at the very least. I wonder why we never see signs like these on department office doors.

HERE ARE THE THINGS THE FACULTY IN THIS DEPARTMENT STAND FOR
HERE IS OUR EDUCATIONAL PHILOSOPHY
HERE ARE OUR PRIORITIES, OUR EXPECTATIONS FOR OURSELVES AS TEACHERS AND FOR OUR STUDENTS
AND HERE ARE THE MEMBERS OF THIS DEPARTMENT WHO AGREE WITH THIS STATEMENT, AS WELL AS THOSE WHO DISAGREE AND HOLD OTHER PHILOSOPHIES, OTHER PRIORITIES, OTHER EXPECTATIONS.

As teachers we face tough personal questions of commitment that have profound meaning in a human, ethical context: whether to work with our students, in every class, to reach mutual understanding about the learning goals and methods to be used, whether to raise at department meetings the really crucial issues about the learning and working environment we share; whether to work openly in support of a colleague who we feel is being treated badly by the institution—or whether, instead, to withdraw from these challenges and seek a comfortable identity as "good teacher," "fair grader" or "nice guy" and leave the rest up to "those who want to deal with all that political crap." Decisions on such questions say what kind of people we are.

However convenient it is to see others as the source of our predicament—apathetic students, conservative faculty, manipulating administrators, the philistines "out there" in society—our real sense of powerlessness comes from lack of vision. We cannot liberate ourselves because, frequently, we cannot see anything different. We know one way to teach a course, one way to advance ourselves professionally, one way to deal with situations that frustrate and confine us. Far from spurring us to try new approaches, our myopic condition consumes our energies in either trying to make unworkable methods...
work or in punishing (or consoling) ourselves for our poor performance.

Do these scenes seem familiar?

She sits in her office with a pile of term papers in front of her. The one in her hand is probably for the department, but the dean has sent it back for “reconsideration,” whatever that means. John had a talk with him two weeks ago. It was very cordial and gentlemanly. John mentioned his experimental sociology seminar, the dean had volunteered that “good teaching” was now being weighed significantly in tenure decisions but lamented the lack of adequate measures for teacher evaluation, and they left the matter at that. He then asked John how things were going on that research project they had talked about last year. John smiled somewhat embarrassed, and said he had been working on it (he really hadn’t) but that it was slow going, what with the demands of his teaching schedule, and of course the baby in the family.

The dean had nodded sympathetically but then said: “You know, John, how and it is for some of these people with tenure who’ve done no really productive work in years. Someone once thought they were good teachers, but they just dried up.” John wondered whether he had been told this because the dean was on his side or as a warning. He left the dean’s office, ushered out with a firm handshake and an amusing anecdote. John was relieved that the dean hadn’t said “no,” yet he had felt slightly anesthetized by the whole encounter. And now that he thinks about it, John doesn’t have the slightest idea where he stands....

Four colleagues in psychology meet regularly for lunch. They have shared a good many frustrations in their department during the past several years. A new chairman (brought in to “upgrade” the department) has made his presence felt in a heavy-handed manner, by stacking department committees, controlling meetings, etc. The four colleagues feel only contempt for this man and for the “lackeys” in the department who support him. Each day at noon they share the latest news from the battlefield, gloating over each failure, every petty or outrageous action committed by their adversaries. The department schism has brought the four of them closer together, but each secretly has a nagging feeling that all this is so much wasted energy. And that their best creative impulses have been paralyzed by an abysmal working environment over which they have no control....

There is pain here, the pain of frustration, insecurity, paralysis. There is lack of essential human communication: the words she ought to share with her student, he with his dean, they with their ailing colleagues, somehow cannot be articulated. So each berates and consones himself by turns.

There are moral issues involved that touch fundamental human chords within these people, but their situations compel them to treat these issues like tactical maneuvers: how to handle the student’s paper, how to “psych out” the dean’s true intentions, how to get around the chairman’s power. When we allow ourselves to deal tactically with matters that vibrate genuinely within our moral core, we do some damage to ourselves.

Last, each of the three scenarios exposes the essential powerlessness of the people involved. There is nothing any of them can do about it! In the end, she will accept the student’s paper, he his dean’s decision, they their chairman’s willfulness, because the alternatives seem exhausting, risky, futile.

Picture yourself in their place. There is nowhere to look for an answer, is there? No higher law of academic procedure, no all-seeing person to turn to. Nobody’s going to bail you out because, after all, it was you who got yourself into this mess in the first place. Some teachers don’t have a problem with plagiarism. Some teachers get their promotions. Some people get along with their colleagues and department chairman. The chances are you tell yourself that you are to blame. You’re no kid. You know the rules of the academic game. Are you asking for someone to stand there and hold your hand?

Pain. You can brush it away, bury it inside, tell yourself the world’s corrupt. Or you can let yourself feel it, feel the pain, the disparity between what you are and what you want to be, as a teacher and a human being. Until the point comes when you find yourself saying: “There must be a better way of relating to my students, so that none feel it necessary to cheat to get through my course... There must be a better way of pursuing my professional growth; there must be a better way of working things out with the members of my department... There must be a better way, because if there is not, it doesn’t make sense for me to remain in the university.”

It may be true that few people are either tough or lucky enough to resolve such dilemmas. Those who were drawn to the university in the first place may have real trouble finding jobs and ways of life that will prove more congenial and rewarding. And the knowledge that the work outside is no more hospitable reinforces our fears of confronting our situations. But I was lucky.

My crisis point came four years ago when, as an instructor who really loved teaching Freshman Comp, I found myself in a “Catch 22” situation. I was told that in order to remain in the English department, I would have to start working on a PhD.
But once I got the degree, I would be "overqualified" for Freshman Comp.

This climaxed a period of intense frustration, during which I and other young instructors struggled against departmental priorities over which we had little influence. Much of that struggle was destructive. We sat around in our offices feeling angry, threatened, humiliated, powerless. We didn’t face our dilemma squarely or develop strategies to protect our values and our jobs, but instead heaped sarcasm and scorn on senior professors who we felt were forcing their values on us.

Getting myself out of that paralysis was doubly difficult: I had to break out of the professional stranglehold and out of my own pessimism and cynicism as well. Almost by chance, I joined a group of faculty and students who were trying to develop an experimental college. Here were people who were not content to do their own thing in isolation but were ready to put their ideals into form and create an alternative environment for both faculty and students. And together we dreamed, conspired, hassled, sweated, fretted and fought our way into existence as an experimental program in basic education: in effect, an educational counterculture within the university.

This counterculture, while our program lasted, had for me all the attributes of freedom and incentive that my former situation had denied me: escape from the seniority system (I taught a seminar in Shakespeare, the subject of my master’s thesis); freedom from being "owned" by any one department; tremendous opportunity for personal development through confronting genuine educational and political issues; and the rewards of working with students who were themselves free to determine their educational lives. The result was a liberation both personal and professional.

Students and faculty were available to one another when we needed help, encouragement, support, and sometimes just a chance to relax and laugh at ourselves. I couldn’t have made it alone, and I don’t think most people could. That mutual support has grown into very warm friendships that have survived the demise of our experimental program and my own departure from the campus. But the experience has changed my life. Liberation, it turns out, is something you can take with you.

At the heart of what all the university community is the great difficulty students and faculty have in collaborating among themselves. From the fragmentation of student movements to the often vicious infighting of faculty in departments, a dismal picture takes shape: everyone is working for his or her own salvation, and there doesn’t seem to be enough salvation to go around.

Somewhere in our professional training they forgot to teach us the collaborative skills, the ones that allow us not only to compete or even coexist with our colleagues, but to be creative with them. And we, in turn, urge students to broaden themselves cognitively — while we isolate them affectively — in pursuit of intellectual development.

But people just plain need each other, in education as in life. That need includes but goes beyond the availability of rational dialog and constructive criticism. Academic freedom has got to mean the freedom to involve, to affect, to influence each other in the crucial situations we face — not just the freedom to be left alone, however important that may be at times.

It is our isolation that must be overcome. Though for me the end of isolation and alienation was coincident with the creation of an experimental program, other teachers have begun liberating themselves by finding colleagues in their own departments or in other disciplines, with whom they have joined in creative, supportive association. Such relationships do not by themselves guarantee our liberation, but they are indispensable to it.

Once this "support level" exists in our personal and professional lives, we can move to confront our situations without constantly tripping over our anxieties. We can demand that academic freedom provide some cover for our searchings within the university, not just for those opinions which provoke attacks from without. Once we no longer have to swallow our frustration, anger or fear, we can cease blaming our students or making scapegoats of ourselves. We begin asking questions about everything we do, and receive sympathy instead of sarcasm from our colleagues. We treat classroom "failures" not as confirmation of our inadequacy or our students' incompetence; they become the focus for self-examination and professional growth. And our educational "successes" prompt us to demand that all our teaching experiences be fulfilling.

What remains is to combine the true educational philosophy we know with the people on our campuses we feel closest to, and work from there to improve our working-learning environment. We can focus on implementing a new major, or a reappraisal of the university itself. We can include students, other faculty, administrators and people from outside the campus in our efforts.

But it all begins with our ability to say where we stand educationally, and to work with others who share our vision. That’s the hard part. Far easier, perhaps, to accept our respected identity as college professor, retreat into our disciplines and let the university take care of itself. There is plenty to keep us busy — classes to prepare, articles to write, committees to sit on, students to see. Far easier, perhaps; but then, liberation never is the easy choice.
"One Teacher's Quest For Liberation"

RESPONSE MEASURE ONE

Instructions

The purpose of this instrument is to measure the meaning that this article has for you.

Here's how to use these scales:

If your impression of this article is very closely related to the adjective at one end of the scale, place your "X" as follows:

Fair ___________ Unfair

or

Fair ___________ X Unfair

If your impression of this article is quite closely related to one or the other ends of the scale, place your "X" as follows:

Timely ___________ Untimely

or

Timely ___________ X Untimely

If your impression of this article seems only slightly related to one adjective rather than the other (but is not really neutral), place your "X" as follows:

Nice ___________ Awful

or

Nice ___________ X Awful

The direction toward which you check, of course, depends upon which of the two ends of the scale seem most characteristic of your impressions of the article. If you consider that your impressions of this article are neutral on the scale because the scale is completely unrelated to your impression, place your "X" in the middle space:

Safe ___________ Dangerous

Important: 1) Place your check-marks in the middle of the spaces as illustrated above. Do not place them on the boundaries which are indicated by a "X".
2) Be sure that you check every scale. Do not omit any.
3) Never put more than one check-mark on a single scale.

Make each scale a separate and independent judgment. Don't look back at your previous response. It is your first impressions, the immediate "feelings" that we want to assess.

PLEASE TURN THIS PAGE OVER AND RESPOND TO THE SCALES
"One Teacher's Quest For Liberation."

1. Successful __________ Unsuccessful
2. Meaningful __________ Meaningless
3. Important __________ Unimportant
4. Useful __________ Useless
5. Relevant __________ Irrelevant
6. Concise __________ Diffuse
7. Hard __________ Soft
8. Strong __________ Weak
9. Constrained __________ Free
10. Convergent __________ Divergent
11. Active __________ Passive
12. Emotional __________ Unemotional
13. Multiple __________ Single
14. Complex __________ Simple
15. Rational __________ Intuitive
16. Cautious __________ Rash
17. Interesting __________ Uninteresting
18. Helpful __________ Unhelpful
19. Objective __________ Subjective
20. Scientific __________ Unscientific
21. Personal __________ Impersonal
22. Abstract __________ Concrete
23. Precise __________ Imprecise
24. Clear __________ Vague
25. Biased __________ Unbiased
26. Thinking __________ Feeling

In the space below, please add any adjectives that you would use to describe this article.
"One Teacher's Quest For Liberation"

RESPONSE MEASURE TWO

Instructions

Please respond to the following questions about this article. Try to answer in as much detail as possible. If you need more space, continue your responses on a separate sheet of paper.

1. This article reflects one manner of examining an educational issue. Is this general way of thinking about and investigating a topic personally appealing to you? Why or Why Not?

2. Assuming that you had the necessary background and training, would you feel comfortable approaching an issue in this manner?

3. In your opinion, does this article produce the type of knowledge that contributes to our understanding of education? Please explain.

PLEASE TURN THIS PAPER OVER AND CONTINUE
4. What did you like most about this article?

5. What did you like least about this article?

6. In as much detail as possible, describe your "image" of the person who wrote this article.
While the many colleges and universities that have recently launched faculty development programs have done so almost exclusively in the area of teaching (Gaff, 1975), certainly these programs have as their more comprehensive goal the aiding of academic people in achieving satisfying and successful careers along all dimensions of their work. As critical as the problem of faculty development is, little empirical data exist. Yet it is important to determine what personal and environmental factors are related to a professor's satisfying and successful career. What is needed is a large-scale analysis that will uncover the variables relating to a professors's self-actualization. This study removes a portion of the existing knowledge deficiency.
CONCEPTUAL FRAMEWORK

Maslow’s (1971) theoretical notion of self-actualization was employed to guide the construction of selected indices. Among Maslow’s several factors postulated to be related to individual growth and development, and hence to career satisfaction and success, four were selected—self-democratization, support, tolerance, and trust. As for the environmental factors, which could affect faculty growth and development and which would be open to institutional determination, two indices—the democratization of the department and the opportunity for personal control of the work environment—were selected. McGregor (1960) and Likert (1961) provided the theoretical bases for the construction of the environmental indices. Both of their works were utilized by Maslow in the development of his ideas. The personal (Maslovian) and environmental indices were examined for their relationship to both satisfaction and success outcome measures.

DATA

The analysis utilized the data from the American Council on Education—Carnegie Commission (ACE-CC) 1969 survey of 100,315 faculty from 303 two-year, four-year, and research universities (Bayer, 1970). The 60% response rate was reduced to a one-third sample of approximately 20,000, a number demonstrated by Trow (1972) to be representative of the total population. So as to maximize comparability, the principal analyses were further limited to white, male faculty with full-time appointments at the rank of assistant professor or higher with teaching appointments in liberal arts departments. This process produced an $N$ of 7,534 and represents the maximum sample (sometimes reduced because of unanswered items) for the principal analysis of the study.

METHOD

From the 287 data bits per respondent, four items were selected as independent success and satisfaction measures:

<table>
<thead>
<tr>
<th>Question 37: Success</th>
<th>Comparing yourself with other academic men of your age and qualification, how successful do you consider yourself in your career?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level and Rank order point scoring</td>
<td></td>
</tr>
</tbody>
</table>
Question 37: (Continued)

<table>
<thead>
<tr>
<th>Level and Rank order point scoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>very successful</td>
</tr>
<tr>
<td>fairly successful</td>
</tr>
<tr>
<td>fairly unsuccessful</td>
</tr>
<tr>
<td>very unsuccessful</td>
</tr>
</tbody>
</table>

Question 38: In general, how do you feel about this institution?

- It is a very good place for me 1
- It is a fairly good place for me 2
- It is not the place for me 3

Question 39: Do you think you could be equally or more satisfied with life in any other college or university?

- definitely yes 3
- probably yes 2
- probably no 1
- definitely no 4

Question 40: If you were to begin your career again, would you still want to be a college professor?

- definitely yes 1
- probably yes 2
- probably no 3
- definitely no 4

Question 37 deals with success while 38 and 39 deal with satisfaction; question 40 could be classified as either success or satisfaction. (The combining of some responses in the scoring was done because of the low number of responses in one or the other or both categories.)

The Maslovian variable of Self-Democraticness was constructed from
10 items that dealt with giving individuals the right to make and/or participate in decisions affecting their lives. Faculty were scored high on Self-Democrativeness when they agreed with statements like "Most undergraduates are mature enough to be given more responsibility for their own education" and "A Student's grades should not be revealed to anyone off campus without his consent." Each index was initially constructed using face validity groupings. Intercorrelation matrices were run for each group. Factors having any correlation coefficient below the .20 level in an index group were not used in that index and were eliminated from the study unless they met the required criterion in another index group. This procedure was followed in constructing each index. Table 1, below, illustrates how six of the ten questions finally used in this index were selected. Cares (1975) provides extended data for each index.

The Tolerance index was constructed from seven items that dealt with respect for the rights of others. Persons received a high score on Tolerance when they agreed with statements that assured black control over their own schools where de facto segregation exists and when they thought that dissident groups contributed important criticisms of American culture. The Support index came from eight items that favored giving control in decision making to those who normally do not have it (e.g., undergraduates regarding disciplinary actions). The Trust index came from four questions that dealt with the credibility of the

<table>
<thead>
<tr>
<th>Variable</th>
<th>19</th>
<th>36</th>
<th>38</th>
<th>107</th>
<th>110</th>
<th>189</th>
<th>246</th>
<th>281</th>
</tr>
</thead>
<tbody>
<tr>
<td>9A*</td>
<td>19</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>9T</td>
<td>36</td>
<td>.3504</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>9T</td>
<td>38</td>
<td>.2103</td>
<td>.4185</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>27Q</td>
<td>107</td>
<td>.2899</td>
<td>.3919</td>
<td>.1901</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>27T</td>
<td>110</td>
<td>.3523</td>
<td>.4274</td>
<td>.3509</td>
<td>.5061</td>
<td>—</td>
<td>—</td>
<td>—</td>
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<tr>
<td>189</td>
<td>189</td>
<td>.3050</td>
<td>.2562</td>
<td>.2220</td>
<td>.1929</td>
<td>.3097</td>
<td>—</td>
<td>—</td>
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<tr>
<td>58</td>
<td>246</td>
<td>.3023</td>
<td>.4117</td>
<td>.2420</td>
<td>.4619</td>
<td>.4542</td>
<td>.947</td>
<td>—</td>
</tr>
<tr>
<td>74</td>
<td>281</td>
<td>.2023</td>
<td>.2850</td>
<td>.0952</td>
<td>.3722</td>
<td>.2621</td>
<td>.3245</td>
<td>.3461</td>
</tr>
</tbody>
</table>

N = 869  
DF = 867  
R @ .95 = .0665  
R @ .99 = .0873

* The variable identifying numbers in the margin (9A, etc.) refer to the original Carnegie Commission questionnaire. The vertical column numbers (19, 36, etc.) below the word variable at the top refer to the author's coding system. Variables 36 and 189 did not meet the .20 criterion level. The relationships not meeting the criterion level are italicized.
higher education system. Faculty were scored high in Trust when they disagreed with the statement that “many professors in graduate departments exploit their students to advance their own research” and that “many of the highest paid university professors get where they are by being ‘operators’ rather than by their scholarly or scientific contributions.”

The environmental index of Department Democratic came from three items dealing with just that matter, viz., participation and voting by all. The Control of Environment index was constructed from six items that had to do with ability to influence policies and practices affecting their work—from controlling the courses they taught to influencing university policy decisions.

Preliminary chi-squares indicated variable associations. Intercorrelation matrices and contingency coefficients were then computed to identify the degree of the relationship between the variables and the outcome measures (satisfaction and success). Typical significance levels were utilized when interpreting the data.

RESULTS

With respect to the Maslovian variables, Tolerance, Self-Democratically, and Support did not appreciably relate to the outcome measures of satisfaction and success. Of the personable variables, only Trust produced contingency coefficients in a consistent and statistically significant way. (See Table 2.) The more trusting individuals viewed their careers as more satisfying and as more successful. However, even here the contingency coefficients do not demonstrate a strong relationship.

The small but inverse relationships between Good Place, Tolerance, and Self-Democracy, and the Success and Satisfaction variables raise the following questions: Do faculty who themselves are highly democratic, tolerant, and supportive have expectations of their environments which are unrealizable? Do faculty who are not as high on these characteristics possess more realizable (i.e., achievement) expectations?

Faculty who possess unrealizable expectations would find little opportunity for satisfaction or happiness. High democratic faculty, for instance, cannot be satisfied in what they perceive to be a non-democratic environment. Very highly democratic faculty may wish for more convergence of their own values with those of the environment but in actuality are seeking what their environment is either unwilling or unable to provide. Faculty who are less democratic may more closely approximate a matching situation between their expectations and their environment. Less democratic faculty, therefore, at least have the possibility for satisfaction.
### TABLE 2. Contingency Coefficients for the Attitudinal and Environmental Indices by the Four Success and Satisfaction Variables

<table>
<thead>
<tr>
<th>Success and Satisfaction Variables</th>
<th>Attitudinal Indices</th>
<th>Environ. Indices</th>
<th>Control of Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Self-Demo</td>
<td>Tolerance</td>
<td>Support</td>
</tr>
<tr>
<td>Success</td>
<td>+.05</td>
<td>-.05</td>
<td>-.06</td>
</tr>
<tr>
<td>Good place</td>
<td>-.11**</td>
<td>-.10**</td>
<td>-.08**</td>
</tr>
<tr>
<td>Satisfied here</td>
<td>-.07*</td>
<td>-.07**</td>
<td>-.07**</td>
</tr>
<tr>
<td>Professor again</td>
<td>+.08**</td>
<td>+.05</td>
<td>+.05</td>
</tr>
</tbody>
</table>

* + = Relationships are direct; – = Relationships are inverse.

* = p < .01.

** = p < .0001.
Also, the fit or lack of fit between expectations and actual experience probably has a direct bearing on feelings of control over one's environment. It is a complex and important interaction process. If one is tolerant, but working in an environment perceived to be intolerant, one is not likely to consider his environment "a good place for me," nor to be highly "satisfied." This disparate state is even more likely to the degree that tolerance is important to the respondent.

When only the "unsuccessful" and "unsatisfied here" answers were viewed, a trend appeared, viz., the lower the Tolerance scores were, the greater percentage of "unsuccessful" and "unsatisfied here" answers. The trend suggests the possibility that Tolerance is related differently to successful and satisfied perceptions than it is to unsuccessful and dissatisfied perceptions. That is, perhaps success and satisfaction are related to Tolerance in the way found by Herzberg, Mausner, and Snyderman (1959) in their study of engineers and accountants. Results of their study supported the two-factor theory of satisfaction and dissatisfaction developed in an earlier study by Herzberg et al. (1957). Essentially, the two-factor theory postulates two continua, one from satisfied to neutral and another from dissatisfied to neutral. Two-factor theory challenges the notion of one continuum with satisfaction running through neutral to dissatisfaction. The contradictory results of the present study for the satisfied and successful answers contrasted with the dissatisfied and unsuccessful answers on Tolerance may be an example of the two-factor theory.

Also, the finding that highly democratic faculty felt they could be equally or more satisfied elsewhere and less democratic faculty felt they could not be equally or more satisfied at another college or university may be the effect of the relationship between democratic attitudes and flexibility, or the reverse relationship of more authoritarian attitudes with insecurity and rigidity, outcomes well documented by Adorno et al. (1950). The faculty who did not want to give responsibility to undergraduates and black students, who wanted to suspend students for disruptions and use of marijuana, who wanted to regulate student behavior off campus, who favored giving students' grades out without their consent, who were religiously conservative, who did not want students to evaluate them, and who felt that no other place could equal or surpass their present situation are the less democratic faculty in this study. The previously mentioned match or mismatch between expectations and realized experience in a particular environment is a second possible explanation for this finding.

As seen in Table 2, the most positive relationships occurred with perceived Democraticness of the department and the faculty member's Control of Environment. Control of Environment showed the highest
relationship: the higher the environmental control, i.e., the more faculty felt they had control of the content of the courses they taught, that they had influence in both departmental and institutional policies, and that their administration supported academic freedom, the more satisfied and successful faculty judged themselves to be.

The importance of Control of Environment can be seen even more dramatically when a comparison is made where only those cases for the three highest levels of Self-Democratic and the two highest levels of Tolerance and Support were selected. This comparison (Table 3) shows that low Control of Environment faculty had a much larger percentage of "not Good Place" answers than expected when faculty were high on Self-Democratic, Tolerance, and Support, while the high Control of Environment faculty had more "Good Place" answers than expected. The 6.41 contingency coefficient shows the high strength of the relationship.

As for the generalizability of the results, the contingency coefficients in Table 4 show that in many instances it is important to control for individual and situational characteristics, especially on the environmental indices. With the exception of academic discipline and age for Dept-Democraticness, the environmental indices have CCs of .15 or higher. Older faculty express greater control of their work situations and are more likely to do so if they are at small, elite, nonacademic institutions. On the other hand, faculty at large, public institutions perceived their departments to be the most democratic. The attitudinal indices require less control, except for age and field (academic discipline). Younger faculty are more Self-Demo, tolerant, and supportive than are their older peers. (Trust has low CCs with all characteristics.) Faculty who teach in the social sciences consistently score highest on the attitudinal indices with the humanities and natural sciences following in that order. See Cares (1975) for an expanded analysis.

**DISCUSSION**

A number of considerations suggest caution in interpreting the results of this study. First, the data were taken from a tape which had been designed to answer questions other than the ones this study investigated. The questions originally used were not specifically designed to study the concept of self-actualization and its relationship to success and satisfaction and therefore have limited applicability. Hence, the indices were approximations of the personal and environmental factors, not direct measures.

Second, this was an exploratory, rather than an experimental, de-
### TABLE 3. Comparison on Results for Contingency Tables on Control of Environment by Good Place and Control of Environment by Good Place Selecting for High Self-Demo, Tolerance, and Support

<table>
<thead>
<tr>
<th>Control of Environment</th>
<th>Good Place—All Cases</th>
<th>Good Place Selecting for High Self-Demo, Tolerance, and Support</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td><strong>Expected %</strong></td>
<td>48.9</td>
<td>43.1</td>
</tr>
<tr>
<td><strong>Levels</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1)</td>
<td>12.6</td>
<td>51.2</td>
</tr>
<tr>
<td>(2)</td>
<td>25.1</td>
<td>54.6</td>
</tr>
<tr>
<td>(3)</td>
<td>33.7</td>
<td>53.7</td>
</tr>
<tr>
<td>(4)</td>
<td>43.5</td>
<td>50.0</td>
</tr>
<tr>
<td>(5)</td>
<td>54.4</td>
<td>41.0</td>
</tr>
<tr>
<td>(6)</td>
<td>62.6</td>
<td>35.0</td>
</tr>
<tr>
<td>(7)</td>
<td>77.9</td>
<td>21.7</td>
</tr>
</tbody>
</table>

**N = 7182**

**df = 12**

**X² = 1101**

**p < .0001**

**CC = .37**

**N = 1134**

**df = 12**

**X² = 221**

**p < .0001**

**CC = .41**

* Column (1) is the percent who answered "my institution is a very good place for me"; (2) is the percent who answered "my institution is a fairly good place for me"; and (3) is the percent who answered "my institution is not the place for me."

The levels came from the construction of the index. Respondents who scored only one item in the set composing the index in the high direction were placed at level 1, those who scored two questions in the high direction at level 2, and so forth.

For example, for all cases, 48.9% say their college or university is a very good place for them. However, when broken down by the Control of Environment the respondent expresses, this rises to 77.9% for those who have the highest level of environmental control and falls to 12.6% for those who say they have the lowest level of control. And when selecting only those faculty who score high on the importance of Self-Democracy, Tolerance, and Support (the right half of the table where the N drops to 1.134), the same overall pattern is retained but the CC increases to .41. Less than one-half of 17 (0.4 for all cases and 0.0 for selected groups) who have the highest Control of Environment think where they now are is not the place for them.

No notions of causality are intended. The study does not attempt to determine, for instance, if faculty see themselves as successful and satisfied because they feel they have control of the environment, or whether they feel that they have control because they see themselves as successful and satisfied. Similarly, the study does not attempt to sort out causes for the relationship between high Democraticness, Tolerance, Support, and Trust scores and high Dept-Democraticness and
<table>
<thead>
<tr>
<th>Faculty and Institutional Characteristics</th>
<th>Environmental Indices</th>
<th>Attitudinal Indices</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control of Environment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dept-Demo</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.33</td>
<td>-.27*</td>
</tr>
<tr>
<td>Academic Discipline</td>
<td>.08</td>
<td>.21</td>
</tr>
<tr>
<td>Institutional Status</td>
<td>.16</td>
<td>.15</td>
</tr>
<tr>
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<td>.06(.11)</td>
</tr>
<tr>
<td>Institutional Size</td>
<td>.24</td>
<td>.08(.37)</td>
</tr>
<tr>
<td>Institutional Religious</td>
<td>.16</td>
<td>.11</td>
</tr>
<tr>
<td>Affiliation</td>
<td>.18</td>
<td>.10</td>
</tr>
</tbody>
</table>

*When p-values of the contingency coefficient are not less than .01, their value is shown in parentheses.

*The negative (-) sign indicates an inverse relationship.
Control of Environment scores. The Inquiry determines relationships and comments upon their possible importance.

Third, there are other possible interpretations of the findings than those made here. For example, it is possible that faculty are successful for reasons other than those implied by the self-actualization process. At least three alternative explanations come to mind: (1) The psychological attributes related to success are permanent and basic individual characteristics. If a person possesses these attributes, he or she will be successful regardless of their source. If, on the other hand, the individual does not possess these attributes, he or she cannot become successful. (2) Success is situational, i.e., if the needs of the individual are well met by the significant others with whom interaction takes place, success will occur. If her or his needs are not met, he or she will not be successful. Said another way, the environment is the prime determiner and is amenable to alteration so that an unsatisfied individual can become successful. (3) Success is achieved by competition. The more able, stronger, and more ruthless scramble to the top, while the less able, weaker, and less competitive are pushed aside. Those who reach the top recognize they are successful and pay tribute to such variables as trust and control of environment.

The data in this study do not allow for separating one interpretation from another. Data on which faculty might fit a specific interpretation were not included on the original questionnaire. This exploratory inquiry cannot solve the dilemma.

The cautions discussed above call for modest interpretations of the data. In spite of their limitations, however, the findings appear to have important implications, which a unified interpretative view helps to clarify. Because the findings are based on a national random sample, they take on added importance. In addition, the Success and Satisfaction variables and the environmental indices, which are the component parts of the major findings of this study, do not share the definitional liabilities of the attitudinal indices.

One of the most consistent and significant findings of this study is that faculty who perceive their departments as democratic and who also have a high control of their environment score higher than the expected percentage for all four success and satisfaction variables. When the highly democratic faculty who also have high control of their environment are looked at, it is found that they have consistently higher percentages of Very Successful, Very Good Place, Very Satisfied Here, and positive Professor Again answers than were recorded by the total sample. Consistently higher percentages for all four attitudinal indices were also recorded when Dept-Democratic and Control of Environment scores were high.
Control of the work environment appears to be the key variable in this study. In ways that could not have been anticipated, this variable has taken on central importance in understanding the relationships being studied. Its companion variable, Dept-Democraticness, may also be a measure of "control." Adler (1973, p. 67) states: "He (the individual) relates himself always according to his own interpretation of himself and of his present problem." The success perceptions in this study seem to touch on "his own interpretation of himself," while the "present problem" for faculty, and probably for all humans, centers around attempts to "control."

Maslow (1971, p. 14) pointed out the importance of freedom from control. He wrote: "... I can certainly say that descriptively healthy human beings do not like to be controlled. They prefer to feel free and to be free." Perhaps achieving or keeping control is synonymous with success for faculty in their work environment. This explanation seems particularly plausible as one reviews the factors which Maslow elaborated as descriptive of the self-actualization characteristics. In particular, he listed a liking for solitude, independence of the physical and social environment, inner detachment, and autonomy. None of these characteristics lend themselves easily to the process of being controlled. Add to this list the notions of play, creativity, spontaneity, and self-choice, and one wonders how a person who is becoming self-actualized could feel successful, satisfied, or happy if he perceives his environment as limiting his own control.

Maslow (1971, p. 208) was familiar with the management theories of both Likert and McGregor and referred his readers to their work. Maslow (1971, p. 282) felt that his nontranscending, "merely-healthy" self-actualizers met the expectations of McGregor's Theory Y, but the transcending self-actualizers "have not only fulfilled but also transcended or surpassed Theory Y." Maslow states: "They (the transscenders) live at a level which I shall here call Theory Z for convenience and because it is on the same continuum as Theories X and Y and with them forms a hierarchy." It is central to Maslow's Theory Z that the needs of the individual are more important than those of the organization.

Both Theory X and Theory Y are management systems designed to insure the "success of the enterprise." As McGregor (1960, p. 75) points out, "... the most important point with respect to management by integration and self-control is that it is a strategy—a way of managing people." While the results of this study support McGregor's Theory Y, they seem to go beyond it and perhaps to challenge its orientation, at least as it relates to faculty and academic institutions. The central idea, which the present study supports, is that faculty do
not want to be managed or controlled. In this study it was the degree
of personal control of environment which related most significantly to
faculty perceptions of success.

An academic institution differs in important ways from product-
oriented organizations. The full growth and development of human re-
sources should be the major purpose of an educational institution as
well as an integral part of its very processes.

On the practical side, those administering colleges and universities
benefit from these findings. Since the importance of perceived con-
trast of the environment and the democratic nature of the department
fall within the administrative domain and are capable of alteration, it
seems possible that increased satisfaction and success can be generated
by the employment of democratic management principles. Successful
faculty development programs need to pay attention to leadership and
to the environment as much as they do to providing support for learn-
ing new teaching techniques.

Cause and effect were not determined in this inquiry, however. Fu-
ture research needs to separate out what can be done with envi-
ronmental considerations to increase success and to determine if crit-
ical personal characteristics are open to change.

FOOTNOTES

1 This perception, which came late in the analysis process, is beyond the scope of this
study. It appears to be a researchable question and should be observed where the at-
titudes of individual faculty and the environmental milieu are both known in order to
see if, in fact, these are intolerant, autocratic, unsupportive places with respect to the
fit with faculty expectations. Recent personal experiences have affirmed this interpreta-
tion.

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Faculty Self-Actualization

RESPONSE MEASURE ONE

Instructions

The purpose of this instrument is to measure the meaning that this article has for you.

Here's how to use these scales:

If your impression of this article is very closely related to the adjective at one end of the scale, place your "X" as follows:

Fair X:____________________ Unfair

or

Fair __:____________________ X Unfair

If your impression of this article is quite closely related to one or the other ends of the scale, place your "X" as follows:

Timely __:____________________ Untimely

or

Timely __:____________________ X:__________ Untimely

If your impression of this article seems only slightly related to one adjective rather than the other (but is not really neutral), place your "X" as follows:

Nice __:____________________ Awful

or

Nice __:____________________ X:__________ Awful

The direction toward which you check, of course, depends upon which of the two ends of the scale seem most characteristic of your impressions of the article. If you consider that your impressions of this article are neutral on the scale because the scale is completely unrelated to your impression, place your "X" in the middle space:

Safe __:____________________ Dangerous

Important: 1) Place your check-marks in the middle of the spaces as illustrated above. Do not place them on the boundaries which are indicated by a "_".

2) Be sure that you check every scale. Do not omit any.

3) Never put more than one check-mark on a single scale.

Make each scale a separate and independent judgment. Don't look back at your previous response. It is your first impressions, the immediate "feelings" that we want to assess.

PLEASE TURN THIS PAGE OVER AND RESPOND TO THE SCALES
Faculty Self-Actualization

1. Successful __________ Unsuccessful
2. Meaningful __________ Meaningless
3. Important __________ Unimportant
4. Useful __________ Useless
5. Relevant __________ Irrelevant
6. Concise __________ Diffuse
7. Hard __________ Soft
8. Strong __________ Weak
9. Constrained __________ Free
10. Convergent __________ Divergent
11. Active __________ Passive
12. Emotional __________ Unemotional
13. Multiple __________ Single
14. Complex __________ Simple
15. Rational __________ Intuitive
16. Cautious __________ Rash
17. Interesting __________ Uninteresting
18. Helpful __________ Unhelpful
19. Objective __________ Subjective
20. Scientific __________ Unscientific
21. Personal __________ Impersonal
22. Abstract __________ Concrete
23. Precise __________ Imprecise
24. Clear __________ Vague
25. Biased __________ Unbiased
26. Thinking __________ Feeling

In the space below, please add any adjectives that you would use to describe this article.
"Faculty Self-Actualization"

RESPONSE MEASURE TWO

Instructions

Please respond to the following questions about this article. Try to answer in as much detail as possible. If you need more space, continue your responses on a separate sheet of paper.

1. This article reflects one manner of examining an educational issue. Is this general way of thinking about and investigating a topic personally appealing to you? Why or Why Not?

2. Assuming that you had the necessary background and training, would you feel comfortable approaching an issue in this manner?

3. In your opinion, does this article produce the type of knowledge that contributes to our understanding of education? Please explain.
4. What did you like most about this article?

5. What did you like least about this article?

6. In as much detail as possible, describe your "image" of the person who wrote this article.
APPENDIX B

KENNEDY MODEL SELECTION PROCEDURE
Kennedy Model Selection Procedure

There are several procedures for selecting the log-linear model which best accounts for the observed data. Knoke and Burke (1980), for example, advocate selecting the model which produces a maximum-likelihood chi-square statistic between the .01 and .35 level of probability. Kennedy (1981) has proposed a somewhat more systematic method of selecting the model which best fits the data. In this two-stage procedure, the investigator not only examines the maximum-likelihood chi-square statistic associated with each model, but also examines the loss of explanatory power resulting from systematically eliminating explanatory model parameters.

Table A presents the format of the Kennedy method. The results of this tabular procedure were used to select the model which best accounted for the observed data when the effect of psychological type (A) and sex (B) on preference for the epistemologically most valid article (C) was assessed. Five models were included in the analysis. Each subsequent model contained one more effect than its predecessor. That is, model 2 had one more parameter than model 1, model 3 had one more parameter than model 2, etc. The Independence model (1) fits the overall marginal frequencies of both explanatory variables (psychological type and sex) and the response variable (article preference). This model generates expected frequencies which occurs when there are no relationships among the variables. The Null model (2) contains the above three effects plus the parameter which represents the significant relationship between the two explanatory variables. This model contains all of the variable effects except those which account for preferential difference among the two explanatory variables. The Psychological Type model (3)
includes all of the previous effects plus the parameter which represents significant differences in article preference among levels of the psychological type variable. The substantive consequence of selecting this model is that psychological types significantly differ in their preference for the epistemologically most valued article. The Psychological Type, Sex model (4) includes all the effects included in models 1, 2, and 3 plus the parameter representing significant differences in article preference among levels of the sex variable. This model posits significant response differences between levels of both the psychological type and sex variables. The Saturated model (5) is the last model to be examined. This model includes all previously mentioned parameters plus the one associated with the significant interaction of psychological type and sex on article preference. Because this model contains all possible variable combinations, it produces expected frequencies which are identical to the observed frequencies. That is, the Saturated model in this, and every other log-linear analysis, totally accounts for the observed data.

The Kennedy model selection procedure consists of two major steps. The first step consists of examining the $\phi$-values associated with the chi-square statistic produced by each model. This step serves as an initial screening procedure to eliminate models which clearly do not fit the data. Beginning with the Saturated model, the investigator examines the $\phi$-value associated with this and preceding models until the significance level of a model is small enough to indicate an unacceptable fit. In moderate sized samples, the model rejection criteria is typically a $\phi$-value of .05 or less. In small samples, a good rule of
thumb is to reject models having $\rho$-values which sharply decline from those of the preceding ones. In this sense, the initial model retention procedure is similar to the scree test used in factor analysis. Table A indicates that both the Null and the Independence model have $\rho$-values much smaller than models 3, 4, and 5. Models 1 and 2 are thus eliminated from consideration.

The second model selection step consists of examining the $\rho$-values associated with differences between chi-square statistics contained in step one. The intent of this step is to select the model which best accounts for the observed data, but has the fewest parameters. The goal is to eliminate as many parameters as possible while still retaining a model which generates frequencies that closely approximate those observed in the raw data. Table A presents chi-square values associated with differences between models 5 and 4, 2 and 3, and 1 and 2. These "difference" statistics are called component chi-squares and represent the degree to which explanatory power is lost when the one parameter not shared by the two models is eliminated. For example, 6.74 is the component chi-square which represents the difference between the chi-square values of models 4 and 5. The value is distributed on the difference between the degrees of freedom associated with the two models, i.e., 9. Table A indicates that eliminating the interaction parameter does not produce a significant loss of explanatory power, $X^2_{(9)}=6.74, \rho<.67$. A similar result was obtained when examining the difference between models 3 and 4. That is, eliminating the main effect of sex does not significantly reduce model fit. Moving up to the next step, however, indicates that eliminating the effect of psychological type on article preference significantly reduces the model's explanatory
power, $X^2_{(9)} = 16.01$, $\varrho < .07$. When the first significant component chi-square is reached, all models below this value are eliminated. Models 4 and 5 are thus eliminated from consideration. Hopefully, the results of both steps converge on a model which best fits the data while containing the fewest parameters. Since Models 1 and 2 were eliminated by the first step and models 4 and 5 by the second, the Psychological Type model (3) was selected as the model which best accounted for the observed data. This model posited significant difference between psychological type on both the sex and article preference variables. Although log-linear analyses involving more variables will produce more complex models, the model selection process is essentially the same as that depicted in Table A.

In addition to the model selection procedure outlined above, there is a method of parameter selection typically used as a follow-up technique once a candidate model has been identified. This procedure provides two valuable sources of statistical evidence regarding which effects (e.g., psychological type) should be retained in the final model selected. The coefficient of partial association is the $\varrho$-value associated with the component chi-square resulting from the elimination of a K-order effect from a model containing all possible K-order effects. For example, in the three-variable case, the partial association of the psychological type effect ($A\bar{C}$) is the difference between the maximum-likelihood chi-square associated with the full two-variable model ($A,B,C$_{AB,AC,BC}) and a reduced model containing all two-variable effects except the effect of psychological type on article preference ($A,B,C$_{AB,BC}). The resulting partial coefficient associated with $A\bar{C}$ indicates the degree to which eliminating the effect will result in a
statistically significant loss of explanatory power. The coefficient of marginal association is the \( p \)-value associated with component chi-square resulting from the elimination of a \( K+1 \)-order effect from a model containing it and all \( K \)-order effects. For example, the marginal association of the \( AC \) effect is obtained from comparing the full, first-order model \( (A,B,C) \) to one which contains those parameters plus the \( AC \) effect \( (A,B,C,AC) \).

The standard rule of thumb is to retain those effects which produce a statistically significant partial and marginal coefficient and to eliminate those effects which do not produce statistically significant partial and marginal coefficients. Effects which produce either a significant marginal or partial coefficient do not lead to a definitive retention decision (for a more complete discussion of these coefficients, see M. B. Brown, Screening effects in multi-dimensional contingency tables, *Applied Statistics*, 1976, 25 (1), 37-46).

It must be noted, however, that although these types of procedures are a valuable resource when determining the model of best fit, the evidence they provide, \( p \)-values, are greatly influenced by sample size. That is, the level of statistical significance achieved is directly related not only to the magnitude of variable effects (e.g., parameters estimates), but also to the size of the sample. This dependency has been and continues to be a vexing problem, especially for the experimental-quantitative research paradigm. Indeed, the limited sample size of this study illustrates the dilemma of not having enough data to fully utilize the most appropriate statistical analysis. The consequence of this dilemma is that certain theoretically relevant
effects were included which produced partial and marginal coefficients exceeding the magnitude of the conventional statistical decision criteria, i.e., p-values greater than .05 and .01. These coefficients are presented in Tables B and C. The reader is invited to compare his or her model selection decisions with those made by this investigator.

Table B indicates the partial and marginal coefficients associated with the two substantive factors examined in the six three-variable log-linear analyses; Table C presents the coefficients associated with the seven effects examined in the two four-variable log-linear analyses.
<table>
<thead>
<tr>
<th>Model No.</th>
<th>Model Title</th>
<th>Parameters</th>
<th>( \chi^2 )</th>
<th>df</th>
<th>( \rho )</th>
<th>( \chi^2 )</th>
<th>df</th>
<th>( \rho )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Independence</td>
<td>A,B,C</td>
<td>31.73</td>
<td>24</td>
<td>.14</td>
<td></td>
<td></td>
<td></td>
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<td>3</td>
<td>Psychological Type</td>
<td>A,B,C,AB,</td>
<td>8.90</td>
<td>12</td>
<td>.71</td>
<td>2-3</td>
<td>16.01</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A( \bar{C} )</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Psychological Type, Sex</td>
<td>A,B,C,AB,</td>
<td>6.74</td>
<td>9</td>
<td>.66</td>
<td>3-4</td>
<td>2.16</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A( \bar{C} ), B( \bar{C} )</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Saturated</td>
<td>A,B,C,AB,</td>
<td>0</td>
<td>0</td>
<td>.99</td>
<td>4-5</td>
<td>6.74</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A( \bar{C} ), B( \bar{C} ), AB( \bar{C} )</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Response variables are frequently denoted by a "bar".*
TABLE 25

Coefficients of Partial and Marginal Association Derived from the Log-Linear Analyses of the Effect of Psychological Type (A) and a Control Variable (B) on Epistemological and Methodological Preference (C)

**Epistemological Preference**

<table>
<thead>
<tr>
<th>Effect</th>
<th>Sex (Table 4)</th>
<th>Graduate Status (Table 5)</th>
<th>Level (Table 6)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Partial</td>
<td>Marginal</td>
<td>Partial</td>
</tr>
<tr>
<td>AC</td>
<td>.09 * .07</td>
<td>.06 * .07</td>
<td>.09 * .08</td>
</tr>
<tr>
<td>BC</td>
<td>.54 .40</td>
<td>.33 .37</td>
<td>.66 .61</td>
</tr>
<tr>
<td>ABC</td>
<td>.66 ---</td>
<td>.50 ---</td>
<td>.28 ---</td>
</tr>
</tbody>
</table>

*Denotes substantive effects included in selected model.

**Methodological Preference**

<table>
<thead>
<tr>
<th>Effect</th>
<th>Sex (Table 9)</th>
<th>Graduate Status (Table 10)</th>
<th>Level (Table 11)</th>
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<tbody>
<tr>
<td></td>
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<td>Marginal</td>
<td>Partial</td>
</tr>
<tr>
<td>AC</td>
<td>.14 * .10</td>
<td>.08 * .10</td>
<td>.09 * .09</td>
</tr>
<tr>
<td>BC</td>
<td>.46 .31</td>
<td>.10 * .14</td>
<td>.25 .26</td>
</tr>
<tr>
<td>ABC</td>
<td>.70 ---</td>
<td>.58 ---</td>
<td>.87 ---</td>
</tr>
</tbody>
</table>

*Denotes substantive effects included in selected model.*
TABLE 26

Coefficients of Partial and Marginal Association Derived from the Log-Linear Analyses of the Simultaneous Effect of Psychological Type (A), Level (B), Sex (C) on Epistemological and Methodological Preference (D)

<table>
<thead>
<tr>
<th>Effect</th>
<th>Epistemological Preference (Table 7)</th>
<th>Methodological Preference (Table 10)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>Marginal</td>
</tr>
<tr>
<td>AD</td>
<td>.12</td>
<td>* .11</td>
</tr>
<tr>
<td>BD</td>
<td>.37</td>
<td>.45</td>
</tr>
<tr>
<td>CD</td>
<td>.47</td>
<td>.40</td>
</tr>
<tr>
<td>ABD</td>
<td>.72</td>
<td>.63</td>
</tr>
<tr>
<td>ACD</td>
<td>.84</td>
<td>.77</td>
</tr>
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<td>BCD</td>
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<tr>
<td>ABCD</td>
<td>.39</td>
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</tr>
</tbody>
</table>

* Denotes substantive effects included in selected model.
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