DISCOVERING COMMUNICATION PARADIGMS WITH Q METHODOLOGY: FERMENT OR SOUR GRAPES?

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Abstract. Kuhn's concept of paradigm has led to widespread commentary and recapitulation in communication theory, but to no empirical treatment due to the absence of appropriate methodology. A Q-methodological solution is proposed using statements from Bronowski's *The Ascent of Man* and administered in a Q sort to members of the editorial board of the *Journal of Communication*, resulting in four factors: The absolutists who believe in a value-free science capable of achieving true knowledge, the scholastics who strive for an encyclopedic synthesis, the one-worlders who accept error as axiomatic, and the Aristotelians who advocate analytic classification and clarification; a second-order factor of fallibilism is shown to underlie the latter three. Discussion centers on the subjectivities which the factors represent as guides to the communication field.

FERMENT AND THE PARADIGM

No fewer than six scholars writing in the *Journal of Communication*'s massive state-of-communication-research edition, entitled "Ferment in the Field" (Gerb-

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ner, 1983), explicitly call upon Thomas Kuhn's (1974) seminal concept of paradigm to aid in making their cases. Nearly all of the remaining authors for the ferment edition assert the belief, in more or less definitive language, that the discipline of communication is structured in and by communication as well as by the attendant relations of power, a tolerable likeness to the ideas of Kuhn.

A diffusion of Kuhnian vocabulary has taken place in the seven years since I completed my dissertation with investigation of paradigm as a central concern (Barchak, 1977). At that time, Kuhn's ideas were already spilling over into the various areas of the social sciences and, according to one knowledgeable source, had already begun supplanting the older sociology of science represented by Merton's (1957) long valued approach. One would have been hard pressed, however, to say that this was the case for communication.

With the situation much changed today and Kuhn now obviously in vogue, it might be expected that the highly respected and well placed scholars who correspond with the *Journal of Communication* would by now have discovered and employed methods to search out the postulatory subjective paradigms that presumably guide communication research. Sadly, this is not the case, if one is to judge by the articles in that journal. Instead of investigation and experiment to lay bare the structure of the discipline, if structure there be, there has merely been a proclaiming or assertion of paradigms and paradigmatic shift with anecdotal support marshalled willy-nilly to support this, that, or other favorite whim or point of view--everything from rock 'n roll to Marxism.

By making the concept of paradigm central to his work, Kuhn sought to portray scientific development as a series of tradition bound periods of "normal science," each followed by a revolutionary break and the subsequent institutionalization of a new worldview and community system that would nearly monopolize a discipline's scientific research. Among his contentions was that some scientists of certain disciplines obtained an underlying cognitive and social theme or

scheme (paradigm) that tended to direct attention to particular problems and phenomena. Such a seemingly extra-scientific basis for the conduct of science--critics and supporters alike called it subjective--put Kuhn at odds with all those who saw the scientific enterprise as a linear collection of facts which at successive stages is fitted with a theory that ever more closely approximates "reality" or "truth."

Kuhn is joined by a significant number of serious twentieth century scholars and scientists who have made more or less careful formulations concerning a generative substructure for science. Charles S. Peirce (1956), for example, spoke of a type of "induction"--variously called a leading principle, an explanatory hypothesis, retroduction, or abduction--that would connect scientific inquiry with common thought, and Jacob Bronowski (1965) expressed a belief that humanistic science always entails a generative paradigm, a "hidden structure." More recently to the point are Gerald Holton's (1974) writings on presuppositions in the construction of theories, scientific and otherwise. I cannot help but add the name of William Stephenson to this ever-so-brief list of those who have pointed the way to the paradigmatic investigation of science. Stephenson (1961), following Peirce, called attention to the generative-paradigmatic nature of science as early as 1961, and offered a fully developed methodology-philosophy of great analytic-synthetic proportions to deal with any and all abductions, paradigms, or schemata. A methodology for the systematic investigation of schemata is something that neither Peirce nor any of the others had hitherto succeeded in creating.

Kuhn's paradigmatic concept has come in for its share of criticism, support, and explication from a variety of directions, but much of it has been recapitulative, with "clarification" being laid on clarification, so that what has been proposed about paradigms by various authors now defies easy understanding, being all analytically *a priori* without a hint of synthesis. Speculation must at some point be brought back to reality, for how far can one rightfully go in theorizing about the state of paradigms in the physic-

al and social sciences until one has attempted to determine their very existence? To this point, Kuhn's paradigm, like Peirce's law of mind, has had little more than commentary, anecdote, and a feeling of correctness to recommend it, but has lacked a suitable methodology. The "law of paradigm" is therefore more justifiably a "theory of paradigm," and this much would have been recognized by Peirce the scientist: "All this," he wrote, "constitutes a hypothesis capable of being tested by experiment." We can move to the beginning of that task, and commence to draw out the evidence affordable by the midwifery of Q methodology.

METHODOLOGY

To probe for the existence of a pradigm (or paradigms) in the field of communication, a methodology is needed that solves a number of problems. It should be able to represent the subjectivity of all scientists of all nations and put the individual scientist at the center of the knowing process. It should not be bound to any particular ideology or power structure. Its measurements should reveal genuine operants, representing the existing schemata, and under no circumstances be artifacts of the instruments by which they were measured. It should use its mathematics, not to count but to chart the structure and shape of thinking. It should be hypothesis-generating and lead to the creation of new ideas at the conclusion of research. And finally, it should stick closely to the logic of science, be interesting in its pragmatics, and allow us to deal with whole persons, not parts of persons. At the time of this study as well as at the present, the single possibility that will allow these crucial conditions to be met is attainable only by turning to the ground breaking methodology provided by Stephenson's Q.

Concourse and sample structure. Deriving the concourse to represent the possible paradigms was the crucial first step. After sifting through the ideas of a large number of philosophers and philosophical writers, a decision was reached to employ the text of

Jacob Bronowski's (1973) "Knowledge or Certainty?" segment from his *Ascent of Man* series, in which Bronowski draws together his vast understanding of art and science, creating not so much a pictorial of both as a panoramic synthesis infused with subjectivity. Ignoring statements of fact, all opinion statements in the brief text were culled, amounting to no more than 32, and assigned *pro tem* to the categories of Table 1.

Table 1
Fisherian Design for "Knowledge or Certainty?"

Main Effects	Levels		
A. Science	(a) scientists	(b) methods	(c) intellectual products
B. Valency	(d) certainty		(e) uncertainty

(Four statements were added to balance out the Fisherian design, some suggested by Stephenson's writings.)

"Scientists" (a) is a *pro tem* categorization that would seem to suggest that science is whatever scientists decide it to be, just as anthropology has been said to be whatever anthropologists say it is. One could either agree or disagree with this, demonstrating either "certainty" (d) or "uncertainty" (e). "Methods" (b) would suggest that science is particularly a set of procedures for investigation of the world about us, with the possibility of affirmation or rejection for each statement. "Intellectual products" (c) would identify the main element of science to be hypotheses, postulates, theories, laws, cognitions, intuitions, and so on--reflecting, again, either certainty or uncertainty. Characteristic statements were such as the following:

- Philosophers have a road to knowledge more perfect than that of observation. (bd)

- The scientist who claims that absolute knowledge is attainable opens the door to tragedy. (ae)

And so on for each of the 3×2 combinations, each of which was replicated $m = 6$ times. A copy of the entire Q sample is available upon request.

Set of social scientists. As to the particular scientists or scholars, it was decided to select the consulting and contributing editors of the International Communication Association's *Journal of Communication*. Although it cannot be said that this group accurately represented all of the possible approaches to communication, it was by far the most diverse aggregate of its kind. Not only did the group represent a considerable number of approaches, but the scholars themselves were from all of the world's inhabitable continents. Many of the *JC* editors had (and have) a worldwide reputation and might be expected to exercise both social and intellectual influence within the domain of communication. There were both men and women in this group as well as scholars from various political environments, ranging from the Western democracies to the Eastern socialist societies.

Q sorting. As it would have been quite impossible financially to interview and Q sort all of the scholars personally, sorting instructions were mailed along with a statement recording form, a deck of the 36 statements, and a more or less blank sheet for free responses. The instructions for the Q sort called for each *JC* editor to sort the statements from his or her own point of view. Sorting from one's own point of view is a surrogate hypothesis, a *condition of instruction*, which supplies the fulcrum for the precipitation of operant subjectivity. Eventually, 37 editors from all over the world returned complete or usable Q sorts, to which was added the Q sort of William Stephenson. Several of the editors elected to append comments, some of which are used below to assist in the interpretation of the factors. Of the comments volunteered, those referring to the "sophomoric" content of the Q statements were among the most amusing.

Analysis. After appropriate preparation, the 38 Q sorts were processed following the usual steps of Q

methodology, i.e., correlation and factor analysis (centroid). As in many studies that contain difficult data, hand rotation was employed to eventually derive four significant factors covering 30 of the 38 Q sorts, as shown in Table 2. A theoretical Q sort was then calculated for each of the factors based on the estimated factor scores.

FACTOR INTERPRETATION

The four operant factors can be summarized as follows: (A) Machian position, a view that science is value-free and capable of reaching absolute knowledge, (B) Scholastic position, directing their efforts to an encyclopedic synthesis of doctrines, yet skeptical that scientific knowledge will derive from this, (C) Bronowski's position, a one-world view of science in which error is axiomatic with regard to methodology, and (C) Aristotle's position, absolute knowledge can be obtained, and the way to this is through analytical classification and the clarification of unambiguous questions.

The original interpretations of the factors comprise more than 100 pages (see Barchak, 1977) and that itself was an abridgment of lived experience. But for all that, the interpretation is a marvel of pattern and consistency, providing paradigmatic information that was not even guessed at before. Each of the factors has an understandable theme, and each of those on the factor belong there, not by category but by personal assessment.

Factor A: Scientific Absolutists

Factor A contains the Q sorts of three Eastern Europeans and a Swede and is the only factor with a paradigmatic subjective structure supporting the notion that everything is knowable to science. One would hardly expect during the present age that important scientific figures in Eastern Europe would be other than steeped in Marxist literature, but we are in haste to suggest that modern Marxist theory is *not* what schematizes and orders factor A. Nor could it be

Table 2
Operant Factor Structure for *JC* Scholars[a]

JC Scholars	Country	Rotated Factors A	B	C	D
Pisarek	Poland	75			
Mestrovic	Yugoslavia	69			
Rosengren	Sweden	60			
Kubin	Poland	47			
Smith	USA		74		
Edelstein	USA		64		
Pool	USA		62		
McQuail	UK		62		
Berger	USA		58		
Cherry	UK		58		
Larsen	USA		56		
Kato	Japan		53		
Himmelweit	UK		48		
Noelle-Neumann	W Germany		48		
Tanaka	Japan		45		
Stephenson	UK/USA			65	
Beinstein	USA			64	
Goyer	USA			59	
Berlo	USA			58	
Singh	India			56	
Rühl	W Germany			55	
Lazarsfeld	USA/Austria			48	
Siciński	Poland			45	
Lyle	USA				75
Werner	Norway				65
Maletzke	W Germany				55
Nakajima	Japan				53
Brown	USA				47
Koning	S Africa				47
Uno	Japan				45

[a]Only significant loadings shown ($p < .01$), decimals omitted; 8 undefined Q sorts are not included.

if it is to include Rosengren, whose social-theoretical orientation is conspicuously subordinated--in articles that he generously supplied--to other interests. One of these is a value-free methodology.

Rather, this factor's position is quite in line with that logic of science which claims the *in principle* possibility of a value-free science that can reach absolute knowledge. Of all the factors, A is the most committed advocate of science, believing that the growth of scientific knowledge should be left to the purview of scientists and experts. With the proper adjustments being made for sophistication and technical interests (and overlooking political allegiances), it is possible to suggest that Sir Karl Popper would mix comfortably with this group. At the least, he shares many of the sentiments and much of the subjective structure of the factor. A comparison of factor A with the theses of the Vienna Circle of logical positivism would also be very much to the point.

These are the most highly ranked statements for factor A:

34. Science progresses step by step by eliminating error. (score +5)
27. An aim of the scientist is to give an exact picture of the material world. (+4)
30. The would-be scientist is not at a university to worship what is known but to question it. (+4)

It is interesting to draw the contrast here between factor A's view of statement 27 and the original quotation from Bronowski (1973), whose words were:

> One aim of the physical sciences has been to give an exact picture of the material world. One achievement of physics in the twentieth century has been to prove that that aim is unattainable.

Factor B: Democratic Encyclopedists

This factor is up against its own boldly, all-

encompassing view that everything everywhere must be taken into account. A statement by Noelle-Neumann is quite typical of this vision:

> ...the communication process in our present society cannot possibly be analyzed and cannot be understood at all, if we do not simultaneously study--in detail and in its broader context--the whole field of social processes and structures.

Even the somewhat cursory review of the professional writings for those on this factor could not restrain the observation that here was a group of people determined to sift through every bit of knowledge in hopes that nothing important might be overlooked. Many of them have at one time or other produced an anthology of approaches to the study of communication or other social science discipline, including Cherry, Kato, Smith, Edelstein, McQuail, and Pool.

Despite the titanic efforts to these editors, or perhaps because of them, the factor remains resolutely skeptical that a coherent scientific paradigm for the social sciences will ever emerge. That science can never be certain is the consensus of factor B, yet the focus is not on "error" or methodology but on modes of knowledge. Berger's statement is not atypical:

> Many people who insist upon numbers and "quantification" as a way of proving anything or everything will find it irritating and even anxiety-provoking, but dealing with art forms, even popular art forms, is not an easy matter. And opinion research is not always the most fruitful way to work with the popular arts.

Put another way, this is a democratic factor that is willing to let anyone have his or her own say--in or out of science--and willing to pay the high personal price for the resulting diversity.

Surely, one would have been hard-pressed to have drawn out these conclusions (or anything much like them) had there not been discovered the organized fac-

tor structure to guide inquiry. Knowing that it is these 12 who are on the factor--and not others--allows examination of the pertinent writings to be carried through from an organized standpoint. In the process is revealed an equally organized standpoint that we might tentatively call the ambivalent or skeptical factor. Something less than complete faith has this factor for social science and the knowledge it has produced. Indeed, this factor, torn between objective investigation and human values, seems contented in its "uncertainty," if one is to judge by the surfeit of approaches they attempt to comprehend or by the statements that are recorded in their writings. But it should be pointed out that this "uncertainty" is of a different kind than that of which Bronowski spoke; it is a skepticism that science can ever be certain--not in the matter of "error" or methodology as Bronowski has suggested--but as *knowledge*. It is a position of relativism that is taken up by the factor as a whole and exemplified here by a statement from McQuail:

> The range of available paradigms or models is inevitably wide, and choice will be related to an overall philosophic or scientific position.

Such is the interpretation of factor B.

Factor C: One-Worlders

It may seem incongruous to group together a West German, a Pole, an Indian, three Americans, and two latecomers to the American continent--one Austrian (Lazarsfeld), the other English (Stephenson). But when we recall that the task here is not categorical but theoretical, the Q sort for factor C can be employed as a guide to their scientific writings, uncovering much of interest.

In the course of looking over these writings we are once more struck by an order that had previously been hidden in a "hopeless mass of idiosyncratic comment, egregious misconceptions, and tangled ideation." What emerges is support for the unification of science and

human values, the acceptance of error as axiomatic, a reliance on methodology for the conduct of science, and a firm faith in science and a wary eye for philosophy.

Optimism toward science is conveyed nicely by Goyer, who says that despite the dangers of "Aristotelian mental myopia" on the part of researchers,

> ...operationalism provides a research point of view entirely consistent with what I perceive to be the needs and opportunities of behavioral science research in the study of communication process. My plea here is for more application of scientific method in the analysis of communication process, and less reliance on mysticism as a basis for predicting communication behavior.

Emphasizing that truth is neither "absolute nor final," Berlo too moves on from Aristotle (and most other philosophers) to assert that

> ...the process of communication dictates a particular point of view about science as a whole; namely that the scientist, like the artist, is in the business of constructing reality. The principles of communication analysis are the principles of scientific analysis.

All of this would be agreed to by others on the factor and by Kuhn and Bronowski, who hold a one-world view of science in which subjectivity and objectivity are conjoined and "error" is taken as axiomatic with regard to methodology. Greater faith is placed in science by factor C than by factor B, but it is a hushed support in comparison with that of factor A.

Factor D: Aristotelians

Factor D presents us with a tolerable reproduction of the classical position of Aristotle. Although the factor is apparently all for a scientific method of knowing, it gives science a philosophical twist by claiming that absolute knowledge is attainable. Its

way to this knowledge is through the Aristotelian methods of analytical classification of objects and concepts and through the clarification of unambiguous questions. Because of the philosophical twist, factor D shares more in common with factor A than do the other factors. But D is clearly closer to factors B and C than to A by way of its greater concern with the possibilities of methodological and human error.

The Fallibilism Factor of Communication Science

Our examination into the subjective structure of *JC* editors has brought to light that a *quest for certainty* is the basis for the science of factor A, although nothing perjorative need be assumed about the factor's desire to achieve knowledge. Nevertheless, if it were ever true that social scientists accepted the possibility of scientific certainty as the basis of their work, the evidence does not support such a contention for three of our four *Journal of Communication* factors.

Indeed, there is an important element of similarity among the operant factors B, C, and D which contradicts this assertion but has received scant mention until this point. Underlying the individual schemata of the several factors is a higher-order general schema whose persistence and magnitude is indicated by the noticeable correlation of the factors. As a consequence of correlation, factors B, C, and D can be given equal emphasis and factored to yield a broad, second-order theoretical Q sort, which like the first-order factors can then be interpreted.

"Uncertainty" statements from Bronowski were meant by that author in two distinct ways, one having to do specifically with Heisenberg's principle of uncertainty and the other more loosely with the fallible knowledge lying behind all human action. One particular paragraph in *The Ascent of Man* holds these both together:

> The Principle of Uncertainty or, in my phrase, the Principle of Tolerance fixed once and for all the realization that all knowledge is limited. It

> is an irony of history that at the very time when this was being worked out there should rise, under Hitler in Germany and other tyrants elsewhere, a counter-conception: a principle of monstrous certainty. When the future looks back on the 1930s it will think of them as a crucial confrontation of culture as I have been expounding it, the ascent of man, against the throwback to the despots' belief that they have absolute certainty.

Either or both of these two dimensions of uncertainty are given prominence in the schemata of the several individual factors. Bringing the individual factors together under the factor of factors, however, all but obscures the axiomatic principle of error while simultaneously illuminating the fallibility of human doctrines.

Fallibilism, then, is what most succinctly characterizes the broad schema underlying the whole of the three *JC* factors. It is a fallibilism that, in Dewey's (1960) phrase, "would place *method* and *means* upon the level of importance that has, in the past, been imputed exclusively to ends." We would add further that the broad factor of *JC* editors will not tolerate an equating of instruments with method, nor will it allow an equation between philosophy and science or the shouldering by individual scientists of complete responsibility for the production and employment of knowledge.

CONCLUSION

Taking our analysis as a whole, it is contended that the four individual factors and the single higher-order factor--all related to significant traditions in the history of human thought--constitute introductory but suitable support for the existence in communication of organized subjectivity, subjectivity that could be the actual guide of the field's research.

To my mind, this more than fulfills the aims of Thomas Kuhn as he searched unsuccessfully for a methodology to give definition to his concept of paradigm. It also gives considerable aid to those bio-

graphers and policy formulators rummaging about their own minds, attempting to discover in their particular fields of concern the condition of the crop of thinkers or notables.

Instead of anecdotal assessment, *a priori* overview, or personal whim, we offer, not a sour-grapes counterargument but a methodology that places human subjectivity at its core, that allows the individual to assess "self" from the point of view of self, and that arrives at factors and theoretical structures to which all can have access.

Some communication scholars in the study just considered have since passed from this world while others have moved on to new endeavors. Thus, it would be improper to claim that the discovered factors display the current organized subjectivity of communication. Nevertheless, the recent reflections on fermentation are insufficient and, unless some Q methodologist takes up the study of the communication field, I suspect that all on-going attempts at grasping its structure will amount to putting new wine into old bottles.

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NEWS, NOTES & COMMENT

The Koffka Connection

In his "The Communicability and Operantcy of Self" (*OS*, October 1979), William Stephenson remarks that "the nearest to our position about self is Kurt Koffka's," whom Stephenson had met during his physics days at Durham and later during Koffka's year at Oxford, and it is illuminating in this regard to read Koffka's remarks about their encounter in the latter's lifelong correspondence with Molly Harrower in her recently published *Kurt Koffka: An Unwitting Self-Portrait* (Gainesville: University Presses of Florida, 1983). Harrower (1906-) was an early champion of the then new Rorschach technique, and is currently professor emeritus in the Department of Clinical Psychology at the University of Florida, and her correspondence with Koffka (1886-1941) spans the years 1928-1941.

The sprinkled references to Stephenson all appear in the final chapter, "In Oxford: The Year Unfolds." The first occurs in the context of the 1939 meeting of the British Association of Sciences in Dundee where Koffka writes Harrower (from Oxford on September 7) that he "heard a rather uninteresting paper by Philip Vernon on prediction of psychological aptitude and a somewhat more interesting paper by Stephenson on physical activity, sports, etc., which was read by Rex