Quantum Theory Media Research: I. Reception Analysis

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ABSTRACT: Q methodology, with its foundation in quantum theory, is applied to reception analysis as it has taken form in Danish communication studies. The mathematical similarity between factor analysis and quantum mechanics is illustrated, followed by introduction of postulates required for the quantization of all psychological experience—of self-reference, concourse, and communicability (not consciousness). Measurement (Q technique) provides for the quantization of psychological events (as defined by Kantor), and is illustrated in a study of a single person watching the TV show Dynasty. The resulting Q factors are subject to the principle of complementarity introduced by Niels Bohr, whose epistemology is integral to language and subjectivity as well as physics. The general system which is advanced is self-contained and provides the kind of theoretical unity for which Danish reception analysis is searching. The range of phenomena to which it applies is to be provided in Part II.

Introduction

It may be that Nordicom Review wishes to serve Nordic Mass Communication Research in particular: however there is also mass communication in general, and in that connection an affinity between what is peculiarly Nordic and Niels Bohr's influence. The basic concern is indeed with cultures, subcultures and countercultures, as Ib Bondebjerg indicates in his contribution to "Reception Analysis in Danish Media Research" (1988). There is indeed conflict and struggle in these arena, for social power, cultural hegemony, and for interpretation of reality. But there is also "play" as in Huizinga's *Homo Ludens* (1950) and *The Play Theory of Mass Communication* (Stephenson, 1967); and now, from Bohr's own impulse, there is the develop-

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ment of a quantum theoretical approach to the mass media and to all subjectivity, in my "William James, Niels Bohr, and Complementarity" series of papers (Stephenson, 1986a, 1986b, 1987, 1988a, 1988b) and prior to that in Stephenson (1983, 1984).

The key concept in this approach is a totally new concept of *measurement* by way of Q technique (Stephenson, 1953). By this means everyone receives the same numerical score, of amount *zero* ($m = 0$) for every Q sort. This has to be compared with the thousands of different scales used in modern psychometrics, in mental tests by the hundreds, each with its own validation and reliability coefficients, its own norms—all now to be ignored, and replaced by one scale, the same for everyone, for every measurement made by a person, and by all persons. *Zero*, about all things truly psychological!

It was an unbelievable concept, and has been largely ignored, now for more than 50 years. No one has ever called attention to this astonishing concept, determined by a profound psychological theory—that of quantization of psychological effects. For when an individual performs several Q sorts about a psychological event, the "ghost field" of quantum effects is achieved for that person by direct measurement *in situ* by that person. That is, whatever went on in the "mind" of the individual is captured directly by the Q sorts, and *measured* instantly. And what "goes on" in the so-called "mind" is apparently governed by quantum theory. Such is the achievement of Q methodology (Stephenson, 1953).

It is to this, as it applies to mass media research in the context of Danish "reception analysis," that one directs attention to the work of Jensen, Schroder, Bang, and Bondebjerg of *Nordicom Review, no. 1* (1988). In particular, perhaps, to the focal situation described by Schroder about the respondent who admits that she enjoys the TV *Dynasty* fantasy world, and who spoke as follows:

> When I sit down in front of the TV it's as if I . . . during that hour one could say that I immerse myself in that world, in those fine dinners and fine drinks and fine clothes. And when it's over, well I'm just myself again (Schroder, 1988, p. 11).

"Reduction"

It has been known since the 1920's that factor-theory in psychometrics, and quantum mechanics in physics, have the same mathematical

foundations (Burt, 1938, 1940).[1] What Heisenberg (1925/1968) was working with in the 1920s, Cyril Burt was engaged upon in 1938 in parallel developments, independently.

We are now able to "reduce" a psychological event such as Schroder describes for the TV-viewer, into a quantum-factor formulation, as in Table 1.

Table 1
Schroder's TV-Viewer

Q Sorts	Operant Factors		
	A	B	C
1. Immersed	X		
2. Time		X	
3. Different	X		
4. Real Self			X
5. Dream		X	
6. Real World			X
7. Others	X		
8. Twenty Years Ago		X	

(X = significant factor loading)

Schroder's TV-viewer, as we shall suppose, has performed eight Q sorts, which, factor-analyzed, give the results as operant factors A, B, C. By *operant* we mean naturally-occurring, not arbitrary or categorical. The factors are subject to Niels Bohr's Principle of Complementarity: that is, AB, AC, BC are in complementarity relation-

[1]Until the spring of 1926 quantum mechanics was mathematical technique of a new kind, important because it produced answers without clearly stated underlying physical principles. Schrodinger was first to propose application of the principles in the context of quantum mechanics (July 9, 1926). But he suggested that waves were the only reality. It was Born on June 25, 1926, who took the decisive step: "It is necessary to drop completely the physical pictures of Schrodinger which aim at revitalization of the classical continuum theory, to retain only the formalism and to fill that with new physical content" (added 1927). Causality was brought into focus as the central issue: "from the point of view of quantum mechanics there is no quantity which in an individual case usually determines the effect of a collision. . . . I myself tend to give up determinism in the atomic world." By the summer of 1926 Born read a paper before the meeting of the British Association at Oxford, announcing his 'new' probabilistic for probability states.

The history is documented by Pais (1986, pp. 255-262), from which I take the above note. The parallel with Q technique is clear: there is no quantity hitherto put forward to explain a psychological event that determines operant factors (see also Note 2).

ships—as indeed are their reversals (there are anti-bodies, so to speak, in subjectivity!).

Table 1 is the exemplar for the quantization of all psychological experience based upon self-reference. We can indicate briefly how this is achieved, as below.

Postulate of Self-Reference

The system begins with the following postulate:

> *Oral statements are of two kinds, statements of fact, and statements of self-reference. The former are capable of proof or disproof, the latter not.*

To sit down in front of TV, and to view for an hour, are statements of fact, as objectively regarded: they are testable without self-reference—anyone, in principle, can prove or disprove the matters. But when the viewer says "I immerse myself in that world," and "when it's over I'm just myself again," the statements are intrinsically self-referent, and incapable of proof or disproof by traditional scientific rules. These are the substance of Q methodology.

The logic of statements of fact is found in Popper's *The Logic of Scientific Discovery* (1959). The logic for self-referent statements is in my *The Study of Behavior: Q-technique and its Methodology* (1953).

Postulate of Concourse

There follows the postulate of *concourse*, now identified with quantumstuff, the *ground* upon which Q methodology operates.

> *A collection of self-referential statements about an event constitutes a concourse, the quantumstuff upon which quantum phenomena depends (Stephenson, 1978).*

The statements for Schroder's TV-viewer could have been as follows:

"I sit down and immerse myself in the program";
"Those fine dinners and fine clothes are also mine";
"I lose all sense of time";
"It's a different world for me";
"When it's over, I'm back into myself again";
"My husband thinks I'm silly to waste my time on TV";
"I don't know what I'd do without it";

"I'm not myself when I view *Dynasty*";
"Of course I know what's going to happen next";
"Sometimes I feel annoyed at what happens";

... and so on, for many more.

These are part of an *oral public culture* as defined by Fiske and Bondebjerg (1988). Everyone in the TV-viewer's culture will know, more or less, what is meant by every statement; and everyone else in the culture can provide statements, different from the above, which will nevertheless belong to this same concourse. There is, in short, a very large number of self-referential statements about the event, known to everyone. This is of general applicability, for all complex psychological events.

A concourse in Q methodology corresponds to a "statistical population." The self-referential statements are not normative, and can assume different meanings in different Q sorts—they are "equipossible and equipotential" in dynamic terms.

Postulate of Communicability

The next postulate is simple:

The concern is with communicability, not consciousness.

This dispenses with "consciousness" as a scientific construct, and replaces it with communicability. The word "consciousness" is a recent addition to our language, entering in the 17th century: the word "conscience" came several centuries earlier (C. S. Lewis, in *Studies in Words*, 1967, tells the story). Earlier there was *conscio* in Latin, meaning "sharing knowledge", with a derivative *conscius*. It is proposed that "consciousness" is a *non-ens*, and that fundamentally *all* that is at issue is "sharing knowledge," which is in essence what is meant by "oral, public culture" in Danish mass media theory. The proposition has been developed in "Conscience and Conscious-ness" (Stephenson, 1980a) and in "Consciring: A General Theory for Subjective Communicability" (Stephenson, 1980b).

Quantization

The principles of measurement now enter the system, beginning with Q technique:

Q technique provides the procedure for quantization of any psychological event.

Psychological events are defined in general psychology by J.R. Kantor (1959), to which we fully subscribe in Q methodology.[2] Schroder's TV-viewer, sitting in front of a TV set and viewing *Dynasty* would be a psychological event in our system.

On August 10, 1926, Max Born provided a "new probabilistic" for physics, for probability of *states* (Pais, 1986, documents it, p. 278). In 1935, Q technique did the same for probability of *states-of-feeling*. The technique involves two distinct steps. *First*, there is the Q sort as such, then there is a set of Q sorts for different aspects of a psychological event.

First the Q sort: a sample of statements from the concourse of the event is assessed as a "forced-choice" distribution of integer scores, with respect to *state-of-feeling*, from *pleasure to unpleasure*, as in the following typical scale:

	Q Sort										
	Pleasure					Neutral					Unpleasure
Score:	+5	+6	+3	+2	1	O	-1	-2	-3	-4	-5
Frequency:	2	3	4	6	7	8	7	6	4	3	2

The "forced-choice" is a *theoretical* necessity, and has no normative implications. *The mean score for every Q sort, for anyone for any Q sample, for any psychological event is always zero* ($m = 0$ in the

[2]Kantor's formulation for a psychological event (PE) is: PE = C(r, sf, rf, hi, st, md) (Kantor, 1959, p. 17) in which R symbolizes the uniqueness of the event, and C that the event consists of the entire system of functions sf, rf, hi, st, md in interaction. The functions are for stimulus (sf), response (rf), history (hi), immediate setting (st), and medium of interbehavior (md).

Thus, for the TV-viewer, the clock (st) may have set her to view TV. She had viewed *Dynasty* often before (hi); there was an expected melodrama (sf), and she was seated cozily before the TV (md). Each function can be represented by one or more Q sorts, performed by the viewer herself: thus "What did you feel as you *immersed* yourself in the TV?" could represent setting (st). What she felt about time could be (st) as well. "What was most different" for her could be response (rf) . . . and so on. *No matter what the conditions of instruction the factors bear no direct relation to them*, corresponding to Born's statement that there is no quantity in the formulation which determines the effect of the TV-viewer's self-reflection on the psychological event so represented. We have never found a direct connection between conditions of instruction for Q sorts to represent Kantor's formulation and the operant factors that result.

example).

It was this, no doubt, that psychometrists found difficult to reconcile with their normative practices.

Second, the respondent (TV-viewer) performs several different Q sorts for various aspects of the psychological event, for example for the following conditions of instruction:

(1) What did you feel as you immersed yourself in the TV?
(2) What did you feel about time in the experience?
(3) What was most different for you?
(4) What represents you as your real self?
(5) What would the feelings be if it was a dream?
(6) What was most like the real world?
(7) What do you suppose most other people like you feel?
(8) Twenty years ago what would your feeling have been?

... and so on.

These eight Q sorts (1 to 8) enter into Table 1. The (8 x 8) matrix of correlations is factor-analyzed, resulting in *operant* factors A, B, C.

The table is achieved entirely within the framework of the *one* person, the TV-viewer in the above case. The statements used for Q sorting are intrinsically *hers*; the conditions of instruction for the Q sorts (1 to 8) are also *hers*, in *her* language. The only constructs involved are those of state-of-feeling for pleasure-unpleasure, and that of "oral public culture," other than Q technique as measurement of *self-referentiality*. That is, the fundamental concern is with *her* self-references, measured by *her* at the origin of self-reference.

Even so, this does not constitute a "closed" system, of a "single case," as can be proved.[3]

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[3]The exemplar for Schroeder's TV-viewer is for a "single case," and questions arise about how to generalize. Logic for the "single case" has been developed, first in relation to J.R. Kantor's interbehavioral systems of science (Kantor, 1959), and again concretely, in a recent article on "How to Buy a Loaf of Bread" (Stephenson, 1993). In the latter it is shown that all general psychology up to 1970 had been involved in explaining how a person goes about buying a loaf of bread, as developed in "The Structure of Intentions" by Margaret A. Boden (1973). All of this was by-passed in my own account of how I go about buying a loaf of bread, depending only upon my own self-referent statements about the event. My operant factors were quantiumized, as they would have been for Schroeder's TV-viewer. [Editor's note: William Stephenson had originally submitted the cited manuscript in 1988 to the *Journal of Melanie Klein and Object Relations*, but he

The Principle of Complementarity

Operant factors in Q are subject to Niels Bohr's Principle of Complementarity, and provide the essence of the subjectivity at issue.

When the individual performs the various Q sorts under different conditions of instruction about the same psychological event, the statements of the Q sample become the "ghost field" for quantization: they vary with their own "probabilistic," set upon the Q sort probabilistic of pleasure-unpleasure with *zero* average state-of-feeling for each and every Q sort ($m = 0$).

In the case of the TV-viewer, assuming three operant factors such as in the examplar above, for factors A, B, C, three different, incompatible or paradoxical aspects of the event are shown to exist. AB, AC, BC are complementary relationships. If A is the viewer's TV world of melodrama for *Dynasty*, the fantasy indicated by C is very different from this—she probably was unable or unwilling to divulge it to Schroder. The two, A, C, cannot exist together—any more than the wave and particle characteristics of light can exist together, yet both are possibilities. Similarly for AB and BC.

The quantum theory possibilities were first mentioned by Professor Burt at a meeting of the *Royal Society of London* (1938) at which Spearman, Godfrey Thompson, Burt, and others, including the present author, were discussants. None proceeded to develop the possibilities except myself. It required distinguishing between two forms of factor methodology, R and Q (Stephenson, 1936), the former for measurements on a normative basis, of *individual differences*; the other, Q, instead, concerned measurements of *states-of-feeling*, by Q technique and its "forced-choice" *state-of-feelings* for each and every Q sort.

Niels Bohr's Epistemology

The system makes possible a new epistemology, in which subjectivity is real, a fact, the essence of reality.

Niels Bohr's dream of a new epistemology, as developed in his famous paper "On the Notions of Causality and Complementarity"

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died before it was accepted for publication. It was published posthumously in 1993 in *Operant Subjectivity (Ed.)*]

(1950), is made substantial in the above system.

William James introduced the concept of complementarity in 1891, in *The Principles of Psychology*. Bohr, in 1927, gave it substance in nuclear physics, and recognized its essence in our everyday language use, proposing a new epistemology. His ultimate purpose, he said, was to see that all experience in science, philosophy, art or whatever, "which may be helpful to mankind"

> ... must be capable of being communicated by human means of expression, and it is on this basis that we shall approach the question of the unity of knowledge (quoted by Holton, 1973, p. 136).

The tool was to be his principle of complementarity, as integral not only to physics, but to the very use of language. This is also our own purpose in Q, as indicated, for example, in "William James, Niels Bohr, and Complementarity: III—Schrodinger's Cat" (Stephenson, 1987, pp. 537-539).

Implications

Reception analysis, in common with all human communicability, can be put upon this fundamental quantum/factor theoretical foundation.

On this basis a new science for subjectivity has been developed, in papers beginning in the 1970's, culminating in the series "William James, Niels Bohr, and Complementarity: I—V" (1986-88).

The system is self-contained, for each and every psychological event. It depends only upon the recipient and the concourse for the event. But the concourse represents quantumstuff for the culture in which the event occurs, the "oral public communication" of Fiske and Bondebjerg. The key to the phenomena is the recipient's *self-referentiality*, the only concept from traditional psychological science except for that of *pleasure-unpleasure* (not psychological hedonism). Q technique is the method whereby self-reference makes its mark.

There are, as Niels Bohr concluded, only two sciences, physics and psychology, both subject to quantum theory. The latter is the Danish mass media concept of "reception analysis," *per se*, the unified theory for which the Danish mass media theorists were looking.

It remains to examine the kind of phenomena the new epistemology and its subjective science elicits, in particular for the mass media. This will occupy Part II of this paper.

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