Subjective Behavior Analysis[1]

Steven R. Brown, Ph.D.
Kent State University

Abstract: *Q methodology was developed in the 1930s and has become increasingly utilized as a means for examining subjective behavior in a rigorous and naturalistic way. One of the advantages of Q methodology is its utility in examining single cases, which, when conjoined with the mathematics of factor analysis, reveals parallels with quantum theory. An illustration is presented from a study of national identity in which spontaneous and indeterminate expressions of national sentiment are selected from interviews and gathered into a Q sample, which is then administered as a Q sort to a small group of participants. Factor analysis of the data reveals identities expressed as national pride, shame, and apprehension. A second study on authoritarianism illustrates the presence of quantum effects revealed in the subjective communicability of a representative personality to which the same Q sort is administered under multiple conditions of instruction, which demonstrates diverse response functions emerging as equivalent to the interference effects of quantum experiments.*

Introduction

It has now been more than 20 years since Montrose Wolf (1978) tried to show behavior analysts how to achieve greater social relevance by introducing the idea of *social validity*, which consisted of bringing social values into the scientific fold by assessing reinforcers in ways that society could understand and to which it could relate. The slippery concept of empathy, for example, was no longer to be disdained or replaced by a system of artificial reinforcers, but shown to be coterminous with maintaining eye contact, leaning forward, minimizing physical distance from the client, emitting "empathic" verbalizations, and other objective behaviors. One worked example consisted of students assigning grades of A through F to features of parent-teacher interactions such as voice tone, fairness, blaming, expressing concern, shouting, showing enthusiasm, and other socially-relevant dimensions, which were then averaged across students for each teacher, thereby vouchsafing that

[1] The title of this paper gives rise to two possible meanings — (1) that an analysis of behavior is to proceed subjectively, or (2) that an analysis is to be made of subjective behavior. Although the former cannot be precluded, the latter is the intent.

Author's address: Brown, Department of Political Science, Kent State University, Box 5190, Kent, OH 44242-0001, sbrown@kent.edu.

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assessments were based on actual behaviors and appraised in terms with which the appraisers were familiar. Among the problems with subjective measurement which Wolf acknowledged was that they could be misleading: "Subjective data may not have any relationship to actual events" (Wolf 1978, 212). Individuals are notoriously inaccurate about their behaviors and reinforcing consequences, and so among the suggestions made were to develop better measurement systems and to teach people more accurate ways of observing their behavior, all the while continuing to avoid any hint of "internal causal variables" (p. 213).

Protopostulatory to Wolf's position is that subjective data can distort "actual events" (hence his stress on *validity*), and Skinner (1953) would agree: "... we may make a report which is in direct conflict with objective observations; we may report as unpleasant a type of event which can be shown to be reinforcing" (p. 82). Wolf and Skinner are interested in factual matters of this kind (i.e., in determining whether something is or is not, *in fact*, reinforcing), and this no doubt contributes to their relative disinterest in subjectivity as a naturally occurring phenomenon. However, a more general science of behavior cannot arbitrarily restrict itself to the assessment of true assertions: Lies, deceptions, and untestable statements may also be lawful, and in any event are the life-blood of a culture.

Among the behavioral postulates of Q methodology (Stephenson 1953) is that a person's subjectivity as such constitutes an actual event which exists in its own right and is measurable in its own terms with as much accuracy as measurements of a therapist's body inclination or eye contact. A *subjective behavior analysis* in this sense finds few benefits from a concept like validity: A person's opinion about something is simply that person's opinion, and inquiring whether it is valid vis-à-vis "actual events" is a separate matter which overlooks the brutely factual and eventful character of the opinion itself. Moreover, a subjective behavior analysis also finds little need for categorical averaging of the kind referred to uncritically by Wolf, relying instead on *functional* groupings in keeping with principles of specificity advanced by Kantor (1945) and Skinner (1953).[2] Finally, Q methodology stands shoulder to shoulder with most other forms of behavior analysis in consigning "internal causal variables" to the dustbin, but it is careful to retain the concept of subjectivity in recognition of the fact that "my opinion is *my* opinion," that "my thoughts are *mine*" (not someone else's), which is scientifically acceptable as long as provision is made for suitable operations. As Stephenson

[2] Well before Kantor and Skinner, Bernard (1865/1927) remarked that "we must never make average descriptions of experiments, because the true relations of phenomena disappear in the average" (p. 135); and as Zizek (1913) later observed, "If masses of items ... are taken together in a series the average so computed has little scientific value, since it does not express the activity of a unified complex of natural or social causes..." (p. 65).

(1953) said, "... the term behavior has to be such as to encompass all operations, from any frame of reference, whether 'inner' or 'outer'" (p. 112).

Wolf can scarcely be blamed for his reticence about subjectivity,[3] which has an interbehavioral history that includes a variety of stimulus functions which behavior analysis endeavors to avoid, the most prominent being connotations related to consciousness. Jager (1998), for instance, equates the two, as does Hobson (1999): "... it is subjective conscious experience that we seek to explain" (p. 3). Ord (1998) associates subjectivity with emotion, while for Rosaldo (1994) it connotes the opposite of detachment; others implicitly refer to it as a substantive entity or internal process that can be initiated, fostered, or terminated at will, like the flow of water through a faucet (Sarbit 1996). In their inventory of senses of subjectivity, Sabini and Silver (1982) identified only one—the subjectivity of vantage points arising from different or shared points of view—that was free of mental entanglements. For his part, Stephenson was insistent that consciousness and related mentalisms were to be discarded, but that subjectivity was to be retained for scientific regard (Stephenson 1968).

Apart from conceptual matters, there is also a methodological side to subjective behavior analysis. Whereas many behaviorists "solved" the public/private problem by restricting science to the former only, Skinner (1953) was more circumspect in recognizing that the dividing line is not permanent and that "the boundary shifts with every discovery of a technique for making private events public" (p. 282). So far as is known, Skinner was unaware of Q technique and its methodology,[4] which was developed almost 20 years previously and which has solved many of the problems which he and Wolf enumerated. Q methodology places the study of subjectivity on a scientific footing for the first time. An evolutionary development of the Spearman School of factor theory in the 1920s and '30s, it has the principle of operantcy at its roots and explicitly adopts major features of Kantor's interbehaviorism (Brown in press; Hayes and Fredericks 1999, 92; Stephenson 1984). In addition, as became more evident in Stephenson's later writings, there is a surprising parallel between the concepts and mathematics of Q and quantum mechanics (Stephenson 1982), including the most recent developments in superstring theory — all of which will gain clarity in the context of concrete examples.

[3] Wolf's reticence was shared by J.R. Kantor, who, in a brief correspondence, once remarked that "it is very difficult for me to deal with subjectivity, although no doubt you only mean by that term individual or personality" (personal communication, March 11, 1983).

[4] Stephenson, on the other hand, was fully cognizant of Skinner's main contributions, and was instrumental in arranging for Skinner to receive an honorary doctorate at the University of Missouri in 1968. It was at this time that Stephenson wrote his paper on "Factors as Operant Subjectivity" (1969/1977) which inspired the journal *Operant Subjectivity* as the main outlet for Q-methodological scholarship.

"I Am an American": A Study of National Identity

A necessary distinction is made between facts (information) and opinion (communication) (Stephenson 1969), the latter being subjective and requiring self-reference, the former objective and without self-reference: Hence, "I am an American" is a matter of fact (or not) and provable or falsifiable by anyone in terms of birth records, passports, court documents, and such. In contrast, the assertion that "America is the best country in the world" is not subject to proof, and is therefore referential to the person who expresses it; i.e., it has value or meaning within the person's frame of reference. In this regard, subjectivity can be seen as ubiquitous and as covering everything from the quiet musings of an undergraduate pondering the possible interpretations of a poem to physicists contemplating the implications of the most recent readings from a particle accelerator, from the political discussions between friends over coffee to the flatulent puffery of the pundits, from the playful communicability of children to the reflections of old age.

Illustrative of subjective communicability are the following comments freely rendered during the course of a brief interview in response to the focalizing prompt, "What thoughts and feelings arise when you hear 'I am an American'?":

> I think of yellow ribbons and red, white, and blue.... I think of all the freedoms we have, democracy, voting—all the things we're taught in school.... I don't have really deep feelings.... I obey laws and vote, but I don't feel patriotic.... I don't think I would participate in a war.... We're privileged in a material sense.... We're a lot better off, and I like that.... I wouldn't trade places with anyone else.... I wish others could be as well off as we are.... I don't feel haughty or arrogant.... There are lots of things I'm not proud of.... I'm not emotional about it, but I prefer this to alternatives.... The depth of my feeling surprises me.... I'm not proud of the homeless, the status of minorities, the poor.... The legal system doesn't always work....

And so forth in boundless proliferation. The interview from which the above fragments were extracted was one of several taken in 1991, in the wake of Operation Desert Storm (the Gulf War between the U.S. and Iraq), which accounts for the references to war and patriotism. Skinner and Wolf would presumably point to the assertion that "I don't have really deep feelings" as the kind of proposition of unknown connection to the true facts of the matter that would justify its disregard pending advances in assessment technology, but a subjective behavior analysis can at least proceed with measurements while others ponder veracity.

As is well known, a collection of subjective communicability such as the above is referred to as a *concourse* (Stephenson1980) from which a Q sample is eventually selected for purposes of experimentation. Individual elements

of the Q sample (N = 40 in this instance) are then distributed from agree to disagree. Once provided, the responses (n = 28 Q sorts in this illustration) are then correlated and factor analyzed, with factors indicating the different ways in which the participants sorted the statements. Factor scores are then estimated for the statements so as to facilitate interpretation.

In this particular experiment, more than two dozen individuals responded, and this resulted in three factors. As might be expected, one of them (Factor A) represented an idealization of America, as is readily apparent in those statements which received higher scores in this factor than in the other two (the three scores to the left of each statement are for factors A to C, respectively):

A	*B*	*C*	*Statement*
4	-2	-2	(a) I'm dedicated to what the country stands for.
3	0	-2	(*b*) I can reach my potential; the only limits are ones I give myself.
2	-1	-2	(*c*) Individuals can decide their own destinies.
2	-2	-3	(*d*) We have made this the richest country in the world.

At issue in factor A is national pride, and participants comprising this factor have identified with key symbols of the political system. On the other hand, factor B appears deeply troubled about the course of the nation, as shown in the following positively scored statements (scores for A to C):

A	*B*	*C*	*Statement*
0	4	1	(*e*) I'm ashamed that we are not doing enough to try and solve social problems.
-4	4	-4	(*f*) There are lots of things I'm not proud of.
-2	1	-4	(*g*) Our public values are disappointing.
4	3	-1	(*h*) I feel lucky, comfortable, and very safe.
3	3	0	(*i*) I wouldn't trade places with anyone else.

It is to be noted that both factors A and B feel fortunate, secure, and unwilling to change places with anyone else (statements *h* and *i*), and so B's discontent is apparently not for itself; rather, for others, most likely the homeless, the poor, the elderly, the unhealthy: It is the plight of these groups, and B's identification with them, that gives rise to B's shame. Finally, rather than pride or shame, factor C expresses apprehension—for the self, for the future, and for the young:

A	*B*	*C*	*Statement*
-2	0	4	(*j*) Crime is getting out of control.
0	2	4	(*k*) I'm concerned for the future.
-1	-3	2	(*l*) Younger people don't seem to have the same motivation and work ethic.
-3	-4	2	(*m*) It's a wasteland for our youth.

Factors A, B, and C are rooted in feelings of pride (based on accomplishments of the *past*), shame (about the *present*), and apprehension (about the *future*)—not feelings construed as internal catalysts which have given rise to the factors, but as "types of adjustment to stimulus objects [e.g., the concept of *America*] in specific types of fields" (Kantor 1966, 403). In this regard, Kantor is in agreement with Skinner (1969), that "feelings are at best accompaniments of the behavior, not causes" (p. 257). (That is, we did not invite persons comprising factor B to display *shame*, but to give their views about *America*; shame merely tagged along for the ride.) Kantor would also have been allied with Bentley's (1908) assertion that "we know nothing of 'ideas' and 'feelings' except through the medium of actions" (p. 177); and even more emphatically, that "we must deal with felt things, not with feelings" (p. 172). This position is also foundational to a subjective behavior analysis.

The Behavior-Analytic Principles of Q Methodology

In this regard, it is worth considering what factors such as the above could mean for a more general behavior analysis, one that would feel as scientifically comfortable examining national identity as it would assessing the eye contact and body movements of psychotherapists.

- First, statements (*a*) through (*m*) above, as well as the other 27 in this particular Q sample—and including the statements in all Q samples ever conceived—are both naturally-occurring and thoroughly subjective in the sense established previously, which is not to say that evidence cannot be amassed in support of some of them, e.g., that "(*j*) crime is getting out of control;" still others are probably incapable of proof, e.g., that "(*g*) our public values are disappointing:" How could anything be done with such an assertion other than asking for a show of hands? In another sense, however, these statements have an objective quality about them. According to Stephenson (1967), national identity is rooted in what "a nation is prepared to talk to itself and others about" (p. 93), and talk is primarily empirical and can be collected and examined, as one might collect and examine butterflies or stamps. It is in this purely empirical sense that subjectivity can be considered to be as objective as the existence of flowers, rivers, and mayflies, and as natural as crossing the street or eating a bagel.

- The selection of Q samples from the concourse involves a few tricks of the trade, but the process is facilitated by principles of experimentation, associated with Fisher (1935) and Brunswik (1947), which do not obtrude on the Q sorter any more than a pigeon's pecking is affected by whether the lever in a Skinner Box is made of wood or plastic. The limited evidence indicates that with proper care, one Q sample from a concourse is about as good as any other for experimental purposes (Thomas and Baas 1992-93), just as one sample of voters is as good as another to the survey researcher, or as one piece of carbon is as good as any other to the laboratory chemist.
- Q sorting injects the same artificiality into a situation that is common to all experiments, but in lesser degree inasmuch as it quickly becomes apparent to the Q sorter that the statements are in the *lingua franca* and that "right answers" are nowhere at issue. (The so-called qualitative methods are often thought to be required to reveal meanings not amenable to quantitative treatment, but Q methodology probes to deeper levels of invariance than typically connoted by either of these conventions.) The +4/-4 rating scale of Q technique is a formalization of the pleasure/unpleasure principle, which, as Spearman (1937, 449) concluded, has probably received more verification than any other throughout the history of psychology, from ancient to modern times; and the quasi-normal Q-sort distribution, which models the Law of Error, has negligible impact on the factor results while establishing conditions that force an operant response (Brown 1985). The Q-sorting process has all of the characteristics of a *psychological event* (Kantor 1959, 16*ff*), including the stimulus functions of the statements (*sf*), the response functions of the Q sorter (*rf*), the participant's personal history vis-à-vis the subject matter (*hi*), the setting in which the Q sort is obtained (*st*), and the medium of contact (*md*) between stimulus and response, all dimensions interacting with all others to produce a unique but far from random event.
- Devlin (1998) asserts that there is a new consensus in mathematics—that "mathematics is the science of patterns" (p. 3). Similarly in Q methodology, it is the role of factor analysis to reveal the diversity of patterns among the various Q sorts. Devlin also goes on to ask what it is that mathematics gives us when it is applied: The answer, "Mathematics makes the invisible visible"

> (p. 10), and this too finds resonance in Q methodology. Subjectivity is without substance in the sense that it cannot be seen or touched, yet in a certain sense it may be said to have structure and form; however, that form is only rendered apparent through mathematical representation. It is the Q sorting which prepares the subjectivity to reveal its structure; i.e., the factors that emerge are due to the Q-sorting operations of the participants, hence their status as functional categories of "operant subjectivity" (Stephenson 1977).

Over and above the preceding principles, there are practical advantages to an applied subjective behavior analysis, just as there are advantages in education, industry, and other arenas in which contingencies can be controlled. The manipulation of reinforcements is rarely of interest in Q methodology, however, since in most instances there is little if any a priori knowledge about what to reinforce and because authorization is usually lacking to engage in control. In applied settings, attention is often focused on asking, "What can be done?", i.e., in mobilizing prudence in anticipation of concerted action (Gargan and Brown 1993). In one recent case, for example, questions arose about why some middle school children were falling behind in their homework (Brown and Parsons, 1998). Before arranging contingencies or jumping to some other phase of implementation, the teachers first gathered the problem children together, encouraged them to talk about homework and why they found it so difficult to accomplish, and then presented them with a Q sample drawn from their own concourse. Of the four student factors which emerged, the first was experiencing psychosomatic reactions, the second was easily distracted from task (perhaps suffering from attention deficit), the third had memory problems (consequently forgot to bring assignments home), and the fourth blamed teachers and other external sources of persecution. The students were then encouraged to volunteer strategies for dealing with their specific homework difficulties. In another school setting, teachers were invited to volunteer possible courses of action that might be pursued to deal with discipline problems, and the factor analysis pointed to three overall strategies: Enforce rules without exception, isolate the problem kids, and focus on staff cohesion (Maxwell and Brown 1999). Space precludes an inventory of other recent applications, which touch on every imaginable aspect of public policy (e.g., Addams and Proops 2000; Brown, Durning, and Selden 1999; Durning 1999; Pelletier et al. 1999; Van Eeten 2001).

The Remarkable Parallel: Quantum Theory and Subjective Behavior Analysis

The term *quantum* has achieved a certain popularity such that it has been drawn upon as an analogy in literature, art, mysticism, and the social sciences,

but in physics it is primarily about measurement, and it is in terms of measurement that it is in remarkable parallel with Q methodology. Stephenson was fully cognizant of this. Trained originally as a physicist (Ph.D. 1926) during the time in which the Copenhagen Interpretation was gaining the upper hand, and only later as a psychologist (1929), he was aware from the outset about the mathematical similarities between quantum mechanics and factor analysis,[5] and it is due to its reliance on measurement that Q is able to escape being just another striking analogy. The similarities extend into superstring theory and developments subsequent to Stephenson's death (for example, see Davies and Brown 1993; Greene 1999; Gribbin 1998a; 1998b).

Apart from the mathematics involved, some of the more striking similarities are as follows, and are more fully treated in Stephenson's later writings (Stephenson 1982, 1983, 1986a, 1986b, 1987, 1988a, 1988b, 1989):

- Thoughts, like birds, sometimes flit and sometimes perch, as William James (1890, 243) said: The latter he called *substantive*, the former *transitive*. Q methodology deals mainly with transitive thought, an example of which is given in the interview fragment above (*in re* the Gulf War). Behavior of this kind is indeterminate inasmuch as we can never predict in advance what the person will say next: Even the speaker rarely knows. In the silence prior to an utterance, virtually anything could be said, but as in the collapse of the wave packet in quantum theory, at the moment of utterance all potentiality vanishes and one thought assumes a probability of 1.00. Transitive thought also has gaps, as when the person says that "I think of all the freedoms we have, democracy, voting—all the things we're taught in school ... [pause] ... I don't have really deep feelings." When one thought is being expressed, others are precluded, in the same way that light can display its wave features or particle features, but not both at the same time.
- Similarly, the statements in a Q sample, like Rorschach plates, initially have a relatively low level of meaning (comparable to the ground state of energy) and are subsequently saturated with excessive meaning and significance in the course of Q sorting. It is in this sense that statements of a concourse are considered to be

[5] Among the earliest references to the connection between quantum mechanics and factor analysis is a discussion before the Royal Society of London involving Charles Spearman, Cyril Burt, Godfrey Thomson, William Stephenson, and others (Myers et al., 1938). I once invited to a graduate seminar a theoretical physicist and a factor analyst, and in the course of the discussion, during which each tried to explain to the other how he went about doing his work (as physicist or psychometrician), the two of them eventually began to discover that they were using essentially the same matrix mechanics to solve their respective problems, the only difference being that the physicist inserted unity into the main diagonal whereas the psychologist inserted multiple R^2. For accessible introductions, see Gribbin (1998b, pp. 224-228), Hammer (1971), and Peat (1990, pp. 35-40); more advanced treatments are in Lyons (1986) and Malinowski and Howery (1980).

"equipotential and equipossible a priori" (Stephenson 1980, 9). Although a statement might mean many things in the abstract, it is eventually endowed with a specific meaning (collapse of the wave packet) and receives a score.

- In the same way that measurement is inextricably involved in what is observed in quantum theory, so it is in Q methodology that the person whose perspective is under observation is also the person providing the Q-sort measure of that perspective; i.e., the "observer" is not the scientist, but the participant, who is observing his or her own point of view while providing a measure of it.
- When a Q sort is performed multiple times by the same person under different conditions, the factors which emerge indicate natural segregations in the person's "mind," and it is at this point that Q methodology and quantum theory coincide:

  > Quantum theory in physics begins with a Hilbert-space vector and provides a probability distribution; in Q the same holds. The Q-sorter projects probability distributions upon an otherwise undifferentiated concourse. It is achieved because of lawful conditions ... imposed upon situations by the conditions of instruction for Q-sorts, comparable to the projections of vectors upon the *eigenvektorens* [sic.] of operators in quantum theory. (Stephenson 1982, 238)

- As with superstring theory, the indivisible unit of Q methodology is the person's point of view, represented not as a single point object (like a score on a variable), but as an elongated dimension (ranging from +4 to -4, for instance) that forms a pattern. In the same way that quantum theory refers to the energy state of an entire system rather than to individual particles, so the Q sort represents a state of mind rather than a variable in a state, as is the case in R methodology, where quantum theory can never serve as other than an analogy.

The latter two points in particular may be thrown into sharper relief in the context of examples provided by Rhoads (2001a; 2001b). More than 40 participants were initially administered a 30-item scale of authoritarianism, which is usually averaged to provide a single point-object score indicating each individual's level of authoritarianism. One of Born's (1927) major contributions to quantum theory was to overcome the limits which had been imposed by averaging in the classical theory, which "introduces the microscopic co-ordinates which determine the individual process, only to eliminate them because of ignorance by averaging over their values" (p. 356). Rather than average, therefore — and in keeping with Kantor's (1945) specificity principle — Rhoads permitted each of the items to find its own

revealed "quantum strangeness" not evident under classical conditions. Rhoads based his analysis only on participants with high authoritarianism scores, and aside from the predictable "authoritarian" factor, with which all participants were associated, he encountered another factor which gave high scores to the following statements:

> There is nothing wrong with premarital sex.... People should pay less attention to the Bible and other traditional forms of religious guidance and instead develop their own personal standards of what is moral and immoral.... A lot of our rules regarding modesty and sexual behavior are just customs that are not necessarily any better or any holier than those which other people follow.... "Free speech" means that people should even be allowed to make speeches and write books urging the overthrow of the government.

Although all of Rhoads's participants earned high authoritarianism scores, the factor analysis indicated a counter-authoritarian response function also, and so Rhoads proceeded to pursue this lead by engaging a small number of the participants in more detailed interviews. One of these participants was administered a Q sort (taken from his own depth interviews) under a variety of conditions of instruction in which he was asked to reflect on himself as he believed that each of a number of significant individuals and groups viewed him, e.g., his mother, father, male and female peers, fellow members of the football team, his priest, et al.

In elaborating upon string theory, Greene (1999) states that "one way that we learn about the structure of an object is by hurling other things at it and observing the precise way in which they are deflected" (p. 152), and in the case under consideration, the various conditions of instruction hurled at him were deflected in three ways (factors A, B, and C), each representing a different side to his character. His factor A reveals what psychoanalysis would refer to as a substantial internalization of the parents (i.e., the fact that the individual's description of himself is on the same factor with his description of how his mother and father view him), which is the kind of conformity that theory would lead us to expect of an authoritarian personality. That this person believes that his favorite teacher and an admired president (Kennedy) would view him in essentially the same way would be indicative of projection. Factor B represents the peer group (comprised of the participant's male and female college friends), and it is likely this dimension of his social existence that gave rise to the sexually-liberated and non-traditional views in evidence previously. Factor C represents organic collectivities (the football team, the Catholic Church) that transcend the self and to which the self voluntarily relinquishes its sovereignty for the sake of group goals and achievements. As in quantum theory, this person's factors are in a relationship of *complementarity*, not by assertion or analogy, but as a consequence of *measurement*: He sometimes conducts himself like factor A, sometimes like B, sometimes like C.

The quantum-mechanical equivalent of interference effects is revealed in those factor scores that display diverse response functions (scores to the left for factors A, B, and C, respectively):

A	*B*	*C*	*Statement*
3	0	-1	(*a*) You've got to have tradition in the family: it helps establish who you are.
0	2	-3	(*b*) I don't think premarital sex is a crime or anything. No one's actually getting hurt.
1	-2	3	(*c*) I think that we should try to keep some of the old rules—they help keep us in line.

In particle physics, interference refers to "the way in which ... waves interact with one another to produce an overall pattern ... of high intensity and low intensity" (Gribbin 1998b, 185), as in the clash of waves of boats moving in opposite directions, and comparable effects are to be found in subjectivity. We note, for instance, that statement (*a*) above receives the highest score (+3) with regard to factor A (parental), but that the momentum of this sentiment does not carry over into factors B (peers) or C (church, football team). Similarly, statement (*b*) emerges to prominence in the interpersonal field dominated by the peer group, and (*c*) is given preference in the church/team context. Factors A, B, and C are the response functions (rf) of Kantor's (1959) psychological event, whereas family, peers, and organic collectivities (such as the football team) are loci of stimulus functions (sf). Interference is therefore manifest in terms of the person's adjustments to shifting fields of interaction. The "hidden variable" view would hold out for the discovery of some other as-yet unknown variable that would resolve the apparent discontinuities among the three factors and render them resolvable to a single explanation (Stephenson 1987, 532, 542). Pending that discovery, however, factors A, B, and C are considered irreducible states, probabilistic in nature, that stand in a relationship of complementarity.

Concluding Remarks

Space precludes presentation of myriad other experiments which would provide details concerning Q methodology's parallels with quantum theory. Suffice it to say that they point in a more realist direction rather than one that would implicate consciousness and mystical mind-matter connections, which are favored widely among human scientists and even among some physicists (e.g., Stapp, 1993). As Stephenson (1989) said in this regard, in a paper published just a few months following his death, "We take a stand with Bohr that the world is real, and quantum phenomena are its substances" (p. 186); and before that, that "there is a reality 'out there,' in physics as in psychology, and it 'jumps'" (Stephenson 1987, 535). In Rhoads's (2001b) single case of an

authoritarian, for instance, the person may comport himself mainly in terms of factor A, but then jump to a different behavioral state when interacting with peers (factor B).

In this postmodern era, in which reality itself is often called into question, Stephenson was an unwavering realist; i.e., he believed in the existence of both material reality (the domain of physics) and the reality of subjectivity (the domain of a subjective science). Science's failure, in his view, consisted in its first having bifurcated the world into material and spiritual and then having restricted itself to the former, leaving the latter to the musings of poets and artists. This was "the shame of science" (Stephenson, 1978), and it is a shame in which humanists have colluded and for which they bear a degree of responsibility for having accepted this limited vision of science.

For their part, human scientists have sought in a reductionistic manner for "hidden variables," increasingly in terms of brain physiology. That the brain is composed of atoms and subatomic particles need not be doubted, but one also needn't descend into neurophysiology to find quantum effects, which, as the above examples show, exist in the subjective communicability of everyday life. Moreover, they display lawfulness—as in the obvious fact (in the previous illustration) that factor A contains the person's self (hence is *me*) whereas factors B and C represent others' views of him (hence are *mine*, but not *me*) (James' Law); and that each of the factors is schematical (Peirce's Law of Mind). In addition, factor A implicates time—the person's Q sorts representing "me now" (t_0) and "me in 20 years" (t_{20})—which raises the possibility of change (Parloff's Law). It is therefore unnecessary for Kantor, Skinner, and Wolf to assume a polite reserve with respect to subjectivity as a psychological event, since with Q methodology such behaviors can be examined quite naturalistically and, as Stephenson (1953) said a half century ago, with as much rigor and objectivity "as any psychologist ever dealt with a rat" (p. 119).

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