SOME THOUGHTS ON COMPLETING COMPUTER PROGRAMS FOR Q TECHNIQUE

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For about a year and a half as I have had time, I have been writing computer programs that researchers with personal computers could use in analyzing their Q studies. The aim was to provide a good companion for students of Q.

The result is six modules now called *Centroid Factor Analysis Programs for Q-technique*, or p.c.q. for short. The programs emerged, as is so often the case, in a time of need. My colleague, Wilma Crumley, and I were beginning a three-year study of Nebraska communities and their newspapers when we learned the central campus computing system would no longer accept data cards for routine jobs. We had been using CENSORT, the excellent program developed by Alex Nesterenko at Iowa, and we had been quite happy with it. In addition to our own work, we had found it a useful learning tool for our graduate students.

Yet the change in our campus computer was imminent, so I began looking for ways to improve the availability of computer-assisted Q analysis.

Solutions involving the campus computing system were complicated and expansive, and they would have been difficult to alter, once in place. CENSORT was no longer being actively supported.) And, with the

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advent of personal computing, it seemed possible to leave big computers altogether and put the analysis more firmly in the researcher's hands, the place, I suspect, which William Stephenson has always had in mind. So I turned my attention to programs for personal computers.

Some hope came at the first Q conference with the rudimentary programs written by Brian D'Agostino. These were sometimes tedious to use: For example, one was required to complete an analysis in a single sitting. The data were merely printed out and not recorded on disk for any future use. At that time nothing else had been written.

It was at just that moment, the late summer of 1985, that the prospects of the community-and-newspaper research project became firm, and with it came a commitment on my part to write the programs. (I called it p.d.q. at first, but writing and testing the code has been *anything* but pretty or quick!)

Until recently, data were duly entered and turned over to a central computer for "batch processing," meaning that much of Q technique had become mysterious activities not readily accessible to student or researcher. Indeed, according to the modern texts, centroid is obsolescent. Why, then, attempt to widen its use now through the present programs?

My reasons were not mathematical ones. The factor analysis texts treat centroid with passing historical interest and little more. As Thurstone, Harmon and others state more than once, centroid merely provides a computational compromise for the statistically optimal solution produced through the principal factor method. The principal factor method is preferred by these textbook authors, and researchers are urged to use this method. Others note that centroid factors are indeterminant, and that they approximate orthogonality at best. Besides, they add, the main reason for turning to centroid--that being a means to avoid the exceptional computational demands of the principal factor method--have disappeared: Computers have taken over the tedious calculations.

Yet, over the years, Stephenson must have interpreted the developments in factor theory and technique quite differently. He has chosen, it would seem to me, to continue to rely upon centroid for precisely the reasons others have rejected it.

While it is not within my purposes here to build a high defense of centroid, two matters stand out.

For one thing, the inherent indeterminancy of centroid matches the subjectivity that is always at issue in Q. During those days when Stephenson was at Iowa, he reminded us that the scientific study of subjectivity is young, and, therefore, that theory is of paramount interest. As applied to factor analysis, we took his meaning in saying this to be that centroid tended to force one to have one's theoretical baggage in order. (We used to parallel it with medicine, saying that in Q we were checking the number of arms and legs, not doing heart surgery.)

For another thing, the mathematics involved are not too difficult for non-mathematicians to understand. As Brown (1980) demonstrates in his *Political Subjectivity*, every step in centroid can reveal interesting information about the matters at issue. I, too, believe students will profit by peeking into factor analysis.

Al Talbott, my mentor at the University of Iowa, taught me much of what I know about multivariate analysis. He encouraged me to perform a hand analysis of a Q study--and then compared my results with the computer version just to bolster my confidence. Performing that hand solution demonstrated the prime place theory must occupy for anyone using Q, indeed for anyone using factor analysis. I have never regretted the experience he helped me through.

Continuing along this line Talbott helped me to see, I know now the computer can be relied upon too much. With Q, it would seem to me, the computer should be limited to doing the arithmetic and little else. Important (and to me gratifying) parts of Q analysis should be reserved for the researcher through opportunities to bring theory into play. The researcher should have opportunity to decide if the correlation matrix needs additional reflection, to choose whether or not to extract another factor, whether or not to attempt additional trial rotations.

In the days of central computers--before personal computers--the opportunities had become almost nonexistent. They had disappeared into the bowels of mainframe computers, and with the loss of them--often in the name of statistical precision--we who work

with Q also had been forced to risk losing sight of important theoretical matters. It is my hope that p.c.q. will help as we seek to sharpen our understandings of subjectivity.

Reference

Brown, S.R. (1980) *Political subjectivity*. New Haven, CT: Yale University Press.

NEWS, NOTES & COMMENT

Recent and Forthcoming Scholarship

William Stephenson (2111 Rock Quarry Rd, Columbia MO 65201), "Sir Geoffrey Vickers and the Art of Judgment," *American Psychologist*, 1987, *42*, 518-520. This paper proposes that the tacit dimension in policymaking, as discussed in Vickers' *The Art of Judgment*, is transformable into operant factor structure in Q methodology, as illustrated in terms of the 1980 Iranian crisis. Employing statements from Shaplen's *New Yorker* article, Stephenson represents the views of Henry Kissinger, Ramsey Clark, Khomeini, the U.S. press, the Common Market, and the USSR among others (including his own), and shows them to revolve around three bipolar positions--two reflecting *knowledge about* the situation, and the third representing *moral sentiment*. The study shows "how science can enter policy-making from the masses of subjectivity always in attendance," apart from the objective facts which mediate the situation.

Bruce F. McKeown (Social & Behavioral Science, Seattle Pacific U) and Dan B. Thomas (Social Sciences, Wartburg College), *Q Methodology* (Quantitative Applications in the Social Sciences Series), Sage Publications, fall 1987. This monograph, part of