DOCUMENT RESUME

ED 095 580 CS 201 544

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TITLE Q-Method 20 Years Later: Its Uses and Abuses in Communications Research.
PUB DATE Aug 74
NOTE 67p.; Paper presented at the Annual Meeting of the Association for Education in Journalism (57th, San Diego, August 18-21, 1974)

EDRS PRICE MF-$0.75 HC-$3.15 PLUS POSTAGE
DESCRIPTORS Communications; Journalism; *Literature Reviews; *Media Research; *Q Sort; Research Design; *Research Methodology

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Q-METHOD 20 YEARS LATER: ITS USES AND ABUSES IN COMMUNICATIONS RESEARCH

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ABSTRACT

Q-METHOD 20 YEARS LATER: ITS USES AND ABUSES IN COMMUNICATIONS RESEARCH

by
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Spring 1974

William Stephenson's Q methodology has been linked to the future of communications research by some, and condemned as "treacherous" by others. This study reviews the uses of Q in published mass communications research over the past 20 years since the appearance of Stephenson's bench-mark text, The Study of Behavior: Q Technique and its Methodology, and provides an assessment of Q's strengths and weaknesses for communications research on the basis of that review.

A number of methodological issues are discussed, with special attention being given to the use of parametric statistics, free vs. forced sorts, distribution shape, number and makeup of items, subject selection, the importance of building items that "do not matter" into sorts, and the relationship between distribution shape and item design.

The survey found thirty mass communication studies, published in English, in the scholarly journals related to mass communications during the years 1953-1972. The studies used four Q techniques: 1) the Traditional Sort; 2) the Modified Free Sort, using a questionnaire format; 3) a "MacLean" variation, testing objects rather than persons; and 4) Q Factor Analysis, reflecting Cattell's rather than Stephenson's viewpoint on Q. The studies used Q for performing five basic functions: 1) State of Affairs preferences; 2) Issues preferences; 3) Gatekeeping; 4) Congruence; and 5) Prediction.

The studies were critiqued individually for their performance in five methodological areas: basic considerations, item selection, subject selection, distribution design, and analytic treatment of data. The results suggest that 1) item design and 2) support for the choice of distribution shape are trouble spots in the use of Q for communications research to date.

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In 1953 William Stephenson's The Study of Behavior: Q Technique and Its Methodology was published, evoking comments ranging from "treacherous"[1] to "the most important single contribution of the year to assessment."[2] In his book Stephenson outlined the practice and rationale for the use of Q method in social sciences research; and although Q has been the center of controversies, it has been largely accepted into the arsenal of social sciences research tools and put to increasing use.

In mass communication research, as published in English-language journals, Q was slow in being adopted. The first article with a clear identification as a Q study using Stephenson's approach appeared some 10 years later.[3] But since that time Q's use has proliferated rapidly. By 1965 Q was being linked to the future of communications research;[4A] and in 1972 seven articles or research briefs using Q were published in mass communications journals.

This study reviews the uses of Q in published mass

communications research over the past 20 years since Stephenson's book appeared, and provides an assessment of Q's strengths and weaknesses for communications research on the basis of that review. Specifically, the study addresses itself to the following questions: 1) What are the important methodological controversy areas with respect to Q that a communications researcher should be aware of in making use of it? 2) What are the primary techniques and functions used with Q in mass communications studies? 3) How have the studies to date performed with respect to the methodological issues? 4) Are thereany recurring trouble spots where Q has been consistently misused, or important matters regularly overlooked, in the studies to date?

Method

The literature was searched extensively for articles and research briefs which used Q-technique, or a clear variation thereof, and were published in English-language journals related to mass communications during the years 1953-1972 inclusive. Secondly, the methodclogical literature was searched and the major issues and controversies noted and analyzed with respect to communications applications. Thirdly, a list of criteria for the assessment of Q-technique with communication studies was compiled on the basis of the pre-

ceding analysis and a general review of the literature. Fourthly, the Q-articles were subjected to two types of analysis: A) the primary approaches to use of Q with these studies were identified and categorized in terms of i) techniques and ii) functions; and B) the criteria for adequate use were applied to the articles individually, and the data overall examined to identify trouble spots.

The reliability of the criteria coding was checked through intercoder agreement. The author's codings were used for the analysis in this study. An alternate coder was provided with the articles, a set of instructions, (see Appendix), and given a brief practice session using non-communications Q studies. The author and the alternate coder were in agreement on 79.5% of the total decision possibilities, (208 differences out of 1015 decisions).

Literature Search: To find the published reports of communications research using Q, Bibliographic Index (Vols. 4-12) was first searched for the target years, 1953-1972 inclusive, under the topics of communication, communication research, mass media, and mass media research. Three basic bibliographies were searched: Psychological Abstracts; (Vols. 27-46, 1952-1972) A Computerized Bibliography of Mass Communications Research, 1944-1964, Danielson and Wilhoit, 1967; and Mass Communication: A Research Bibliography, Hansen and Parsons, 1968.[4B] In addition each issue of the following peri-

odicals was searched for the entire period: A-V Communication Review (Vols. 1-20, 1953-1972), Gazette (Vols. 1-18, 1955-1972), Journal of Broadcasting (Vols. 1-17:1, 1956-1972), Journal of Communication (Vols. 3-22, 1953-1972), Journalism Quarterly (Vols. 30-49, 1953-1972), and Public Opinion Quarterly (Vols. 17-36, 1953-1972). Thirty articles were found. These are identified in Appendix A. Twenty-three of the thirty were found in one source: Journalism Quarterly.

To find the appropriate methodological articles and texts Bibliographic Index and the above mentioned three bibliographies were again searched. In addition Brown's "Bibliography on Q Technique and Its Methodology"[5] was searched, along with the Annual Review of Psychology for the entire period under the topic "Q", and "Articles on Mass Communication in U. S. and Foreign Journals" under the topic of "research methods" in the numbers of Journalism Quarterly for the period. Other references were taken from the articles themselves. The methodological articles and texts used in this study are listed in Appendix B.

Limitations: Dissertations and other papers not published in the journals noted above were not included in the study.

The critiques were of the research as it was reported in the literature. The actual studies may have differed from the manner in which they were reported, i.e., data on item design or distribution shape choice may be lacking in an article although the author did in fact do good work in these areas. But this could not be assumed to be true without support and thus the studies were critiqued as reported.

Validity: A rough validation of the Criteria for Assessment of the Q studies was performed. The author checked his own assessment of the relative validity of each criteria item with those of two communications' professors familiar with Q method and its literature: Drs. Edward Trayes and Thomas Gordon, Temple University, Philadelphia, Pennsylvania. A Five point "validity" scale was used.

There was general, positive, agreement on 22 out of the 25 criteria items (average score 4.0 or better on the 5 point scale). For the three "non-unanimous" items, (items II:1, II:2, V:7--see pages 23 and 26), the split was 2 to 3 in favor of each item. Item V:7 scored the lowest overall average of 3.0.

Methodological Controversy Areas

In the typical Q study a group of items is collected with reference to some particular area of interest. The items may be statements, whole or parts of articles, photographs, advertisements, headlines or the like--any group of data that can be combined into a set for sorting by an individual. An individual then sorts the items into a forced distribution, usually some variation on the bell-shape,

according to a set of instructions such as: "Sort these from statements which most describe you to statements which least describe you." The resulting Q-array is then transformed into a set of standard scores, and correlated with sorts by other people who sorted under the same conditions with the same items, or with another sort by the same person on some different criterion. The resulting correlations are then factor analyzed and "typal" Q-arrays created for each factor. The statistical treatment may vary, but the basic Q-technique is the sort by an individual.

The issues of controversy with regard to the use of Q-method include: the use of parametric statistics, free vs. forced sorts, the shape of the Q distribution, the number of items, the criteria for item makeup, and subject selection.

Use of Parametric Statistics

The Q-sort process, as described above, is in essence a rank-order procedure. But ranking is normally thought of as producing ordinal data for which only nonparametric statistical tools are appropriate. How is it then that Q, a basically rank-order procedure, uses parametric tools of analysis such as Pearson's "r", factor analysis, and "F" analysis of variance, when parametric statistical tools are usually thought of as requiring interval or ratio data?

The question has three facets with regard to Q: 1) the neutral, or distensive, zero base; 2) the equality

of intervals; and 3) the adequacy of "approximate" data.

Neutral zero. Stephenson's rationale and prime claim for Q as a powerful methodology capable of using the parametric approaches of factor analysis (and even analysis of variance) is rooted in the fact that Q-sorting is basically a self-reference operation. "Every measurement involves the self explicitly, as a self concept or the like."[6A] "In Q-method . . . all measurements retain self-reference."[6B]

The persons performing Q-sorts usually sort items with reference to themselves, along a continuum from a positive (+), through a neutral (0), to a negative (-) pole (most favorable to least favorable, agree-disagree, etc.). The crucial element, from the statistical standpoint is the neutral sector because it is here that one reaches a base for transforming the sort from ordinal ranking into interval, and even ratio, data reflecting a more solid base in the real world and allowing for the use of parametric statistics. The neutral point is point zero for transforming the sort data into standard scores--"pure numbers whose mean is zero and standard deviation is 1.0."[7]

> This zero, because it is at a point of not mattering to the person, is necessarily at the same absolute level for all persons, for all Q-sorts, for all conditions of instruction for a given XYZ situation.[8]

Thus, "the scores given to the statements by different individuals are comparable--the zero on all scales is the same absolute value for everyone."[9] The transfer to pure numbers--standard scores--provides the data in intervals, and the basic self reference of neutrality for each person provides an absolute zero--the basic necessity for ratio data. This establishes a flexible but sufficient ground for using parametric statistics with Q data.[10]

This points up, however, a very important criterion in the selection of Q-sort items. There must be neutral items. "The Q-sample is chosen so that many statements do not matter (Stephenson's emphasis) to the subject..."[11] (This implies in turn that one must know something about the persons under study and about the items being sorted.)

If there is not a large number of neutral statements in the sort, then in using a "forced" quasi-normal distribution--or any forced distribution--one runs the risk of having items which do not reflect an absolute zero, for the person sorting, being allocated to that position.[12] This then calls into question the validity of a study. (For example, if all the items in a sort were "live" items for an individual--such as, he got upset at any mention of "mother", to which all the items referred--then no matter what kind of distribution he or she was forced or free to sort the items into, there would be in fact no

absolute zero for that person reflected in the study).

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Equal intervals. Even with the absolute zero point (or "distensive zero" as Stephenson calls it[13]) there is still question as to whether the sort decisions do in fact reflect real intervals for the individual sorters; and Cronbach and Gleser criticize Q for the lack of equal intervals.[14] The assumption of equal intervals is a large one. There is no question that the standard scores provide neat, clean intervals; the only question is to what extent these reflect the real magnitude of the sorter's intervals.

In a Q-study by this author, for example,[15] several respondents reported that they were much more favorable about items they placed at the highest end of their forced distribution sort than they were negative about items placed at the lowest end of the scale. The implication is that a Q-sort may provide a solid reality base in the distensive zero of "it doesn't matter", but that the subsequent intervals on either side of that zero mean may not be as precise as one would like. It is thus probably appropriate that in the analysis of Q data the extremes of item placement receive particular attention, while the "in-betweens" are relatively neglected.

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Approximation. The preceding discussion suggests that although Q utilizes parametric techniques in treatment of its data, it is not really producing the kind of exact data usually associated with those techniques. Several of the early reviews of Stephenson's Study of Behavior, particularly that by Cronbach and Gleser, attacked it on precisely this point.[16] Stephenson and his followers, such as S. Brown, granted the validity of those criticisms if one accepted certain mathematical models; but they did not accept those models for use with Q.

Stephenson does not approach the meaning and use of the parametric tests commonly used with Q with the same expectations of precision as do his critics. In fact one might describe his position as the acceptance of approximation, rather than absolute precision, as the adequate standard for the use of statistics. In Stephenson's view, Q is meant more for discovery than for verification[17]--it is primarily abductive rather than deductive.[18] It is a fluid tool--and the statistical techniques used with it are intended to be taken and used in a similarly fluid manner.[19]

Thus Butler and Fiske recognized that Q-sortings "yield no more than a set of ranks with an arbitrary number of ties,"[20] and that the appropriate statistic for correlation would be Kendall's tau; but then proceeded to move into the realm of parametric tools using the criterion

of approximation. Product moment correlations "satisfactorily approximate" a matrix of tau calculations, they argue, so they can be substituted. The same kind of approximation extends one into the use of Thurstone's multiple factor analysis. Stephenson readily seems to accept this kind of approach to statistical tools with Q.

> Quite rough and ready procedures are adequate . . . since one's real interest is in the psychology, and not in any search for strict parameters or the like of sophisticated statisticians.[21]

It should be clear then that the data supplied by Q use of Pearson's "r" and factor analysis, etc., does not, and should not be expected to, reflect the same precision that those parametric tools may elsewhere.

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Even with this proviso it should be further recognized that some parametric tools may be less appropriate than others. The use of analysis of variance with Q has long been criticized and/or warned against.[22] Whereas the grosser abductive/inductive tool of factor analysis, searching for commonalities, can allow for more statistical looseness; the more discriminate deductive analysis of variance, trying to isolate and identify shades of difference, cannot. Despite Stephenson's references to analysis of variance, Brown's search of the literature found

> not . . . a single paper by Stephenson in which

> analysis of variance is the primary analytic method, and only a handful . . . in which he mentions (it), and then in the form of a warning that it ought not be given analytic prominence.[23]

In view of the previous discussion that warning should be heeded.

If one finds it necessary to use analysis of variance with Q, two suggestions by Kerlinger should probably be followed. 1) Use a fairly large number of items in the Q sort and 2) raise the requirements for statistical significance--to the .01 level. In most cases of statistical significance with Q that Kerlinger encountered, he found F ratios to be so high as to leave little doubt as to statistical significance. With "borderline" F ratios one would probably do well to be cautious in interpreting the statistical significance of Q results.[24]

Forced vs. Free

The "forced" nature of Q-data, and in particular the fact that they are typically forced into a bell-shaped distribution, has been a source of controversy from the beginning of Q discussions. Gaito, picking up on Q's lack of statistical independence, reported that "severe defects appear present for variance analysis tests of significance when forced sorting is involved; moderate distortion, when

free sort is used."[25] And Jones, in a direct attack on what he saw as the inference implicit in the usual Q-sort that "the distribution of the degree of development of the universe of traits within individuals is a quasi-normal distribution",[26] found in testing three different groups that none chose the same free sort and that none chose anything close to a bell-shaped curve. Instead they tended to roughly approximate different variations on a U-shaped curve. It might even be argued that a free sort could provide more closely "interval data", (Jones reports that his "free" sorters felt confident about their intervals when queried on the point)[27], and thus strengthen Q statistically. All of this would seem to imply that free sorts should be substituted for the usual practice of using forced sorts with a quasi-normal distribution. However the question is not quite that simple.

The question of free vs. forced procedures in personality testing, and particularly the merits and potential dangers of forcing, have been discussed at length in the literature on social research in general.[28] It is a two-way street. The primary arguments <u>for</u> forcing are that it eliminates "response-sets" which can crop up with free procedures, provides data in convenient form for comparison and computation, and encourages the sorter to reveal levels of descrimination that he might not otherwise in a "free" setting. On the <u>con</u> side it is asserted that

the data thus obtained may be in some sense the "creation" of the tool itself; that the "unnaturalness of the forced procedure wrecks the spontaneity" of the sorters decisions, chances raising hostility and resistance to the procedure, and this increases distortion; and that the loss of "independence" is statistically damaging.

Even if one decides to use a free sort, one must decide "how free is free?" Jones "free" sorts, referred to above, actually required the sorters to put at least one card into each pile of a nine-point distribution of equal-appearing intervals. And MacLean, in using a modification of free sorts (wherein data secured through a questionnaire are transformed into Q-arrays) stresses the importance of instructions which "sort of urge them to distribute (the items) across (the scale points) and to work in a sort of normal distribution."[29]

What one has to keep in mind with Q is what one is trying to do. As discussed above, Q is generally an abductive tool for discovery rather than verification; thus the elimination of response sets and the evoking of more discriminations are desirable, while the exactness of statistical procedures is not as essential. Similarly one is usually interested in comparability of data, in communication studies. In a psychoanalytic situation where one subject is being tested over time the use of a free sort

might provide valuable information by the variation in the sort shapes, but most communication studies involve the study of groups of people and the search for "types" for which comparability of data is a primary concern. For this the forced sort is generally more convenient.

On the whole the forced procedure appears reliable. Advocates of free sorts have argued that free sorts would be more reliable and provide more data; but Block, and similarly Frank, found that forced Q-sorts were at least as stable (reliable on re-test) as free sorts.[30] And in addition Block found that the forced sorts produced more discriminations and no loss in psychological meaning of the data. Any "extra meaning" that a free sort might produce by analysis of differing sort shapes, could be found in a forced sort by "examination of the Q-item order, i.e., item content."[31]

Whether the free sort might produce a better interval is a moot point requiring further verification since Livson and Nichols found that the sorters own judgement about the "naturalness" of their sorts was highly unreliable and basically "irrelevant to reliability of judgement."[32] The "confidence" that Jones "free" sorters felt in their intervals is thus suspect. The Livson and Nichols study further affirmed that "the Q sort <u>does</u> seem to be able to say what the sorter wants to say despite the sorter's doubts that his true impressions are 'coming through'."[33]

Overall it appears that the use of a forced procedure with Q is fairly well supported in the literature and it is probably more appropriate for the bulk of communication studies than a "free" one.

Distribution Shape

The question of the shape also deserves some attention. The common practice is to use a normal or quasi-normal distribution with little explanation as to why. Yet Jones study clearly suggested that people would not freely choose a bell-shaped distribution.[34]

A key issue in the question of distribution shape is item makeup. The use of a bell-shaped distribution must be supported by the item selection process. Built in must be, as Stephenson suggests, many statements that do not matter to the subjects and as approximately as many for him to agree with as to disagree with.[35] Given this kind of configuration in the item makeup one then has a basis for expecting a bell-shaped distribution to emerge with many "neutrals" in the middle and roughly equal amounts on either end.

One practice, which appears in the literature occasionally, is that of basically dichotomizing the items for sorting. A strong dichotomy, especially in a controversial-issues area, would naturally suggest a U-shaped distribution, rather than a bell-shaped one, on an agree-disagree sort

for anyone who felt strongly about a particular situation or issue. (It would require empirical verification, but the question is raised as to whether the general "U" shapes "freely" chosen by the subjects in Jones' study might not have been roughly inherent in the combination of items selected for sorting.) The practices of strongly dichotomizing items for sorting is doubly dangerous because while it tends to damage the base of absolute zero of "not mattering" (which establishes the comparability of responses) it also calls into question the validity of using a bell-shaped distribution. Using a forced-normal distribution with a strong dichotomy in the items would appear to be validity suicide.

The building-in of neutral items is thus an important part of the support for using a bell-shaped Q distribution.

It should be noted before we leave this discussion of shape that Stephenson rarely uses what is usually thought of as a normal shape--such as (1, 2, 3, 4, 5, 4, 3, 2, 1) --but rather suggests, and uses himself, a flattened, platykurtic shape such as (3, 5, 6, 6, 6, 8, 6, 6, 6, 5, 3). The more flattened curve apparently allows for more inter-item discrimination. That, according to Livson and Nichols, increases the test-retest reliability of a sort.[36] Livson and Nichols suggestion that as the number of inter-item discriminations rises the test-retest reliability will increase or at least not fall, coupled with Stephenson's sug-

gestion that "a minimum of 10 classes is advisable, for a flattened, platykurtic distribution...,[37] indicates that a bare minimum of piles or classes in the typically odd-numbered sort would probably be 9, and 11 a more suitable minimum. A flattened (platykurtic) bell-shaped distribution should probably be used rather than a strictly "normal" one. In any event the choice of shape should be explained relative to a particular study, and supported by the structure of the items.

Item Selection

The question of how to build neutral items into a sort raises the question of criteria for item selection.

Anything which helps to expand the variability of meaning amongst items, which inputs more shades of meaning into them, while still keeping them tied to the central theoretical/thematic conception of the sort, should help to build in "neutrals". The obvious procedure for accomplishing this is the balanced-block, factorial design which is what Stephenson suggests. "The distensive zero is taken care of, usually, when a balanced structured design is employed" in generating sort items.[38]

In a situation where several variables are being built-into a sort, the balancing of these in a conscious block design should help to spread out the shades of meaning of the theoretical variables such that the extreme posi-

tions do not dominate and a good many more nominal positions are reflected. Where one does not have the kind of theoretical solidity to build a balanced block design one is still probably aware of the general components of the situation and can include in the items a sufficient number of different potential variables related to the central question to mitigate against the U-shaped bias of a strong dichotomy. Kerlinger gives the example of a study which divided the items up between six different "ideal" types of men: theoretical, economic, aesthetic, social, political, and religious.[39] The assumption, or hope, is that for a given personality, one type will evoke strong affinity, another strong disassociation and the broad remainder reactions somewhere in the middle. One can also help the "normalness" of the shape by preselecting persons who belong to the types, e.g., ministers, bankers, artists, etc.

The use of an essentially unstructured sort on the other hand may call into question the validity of using a bell-shaped distribution and limit a study. If an unstructured sort is the only kind that can be put together, one might consider using a "free sort" approach of some type, although this will complicate comparisons and computations.

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Another caution in item makeup is to control for the social desirability (or health/sickness) of items.

According to studies by Edwards and Horst,[40] Edwards,[41] and Kogan et al,[42] social desirability of the items definitely affects sorting. Edwards found that "one might predict fairly successfully, on the average, the Q sorts of subjects, provided only that we have available the social desirability scale values of the items used in obtaining the Q sorts."[43] Kogan et al found that social desirability and health/sickness were essentially the same variable and suggested a way to "partial out" the effects of these variables after the sortings.[44] The process is cumbersome however and they strongly suggested controlling for the factor beforehand in the item selection.

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Two final topics that should be mentioned with respect to item makeup are reliability and discriminatory potential. A good deal has been said about the stability, or sort-resort reliability, of various kinds of Q-techniques. Quite often it is the variance in the placement of items that is tested for reliability; and this can be done in a pre-test of the items with a few trial-sorters. However, if one goes back to post-test for reliability, item reliability may not be as important as overall factor reliability. Harris suggests that, clinically, "meaningful relations exist not in overt behavior (the item-content of the Q-sorts) but in underlying dynamics (the factors)"[45];

and notes that in situations such as psychological self-ideal-self sorts over time an individual might "choose quite different Q-sort items to express an enduring incongruence between self and ideal-self."[46] Thus in certain situations one may want to check for underlying factor reliability.

One place where this may occur is with regard to the discriminatory potential of items. Discriminatory potential is probably best understood in relation to the concept of "consensus." An item is a "consensus item" when all the sorters place that item into essentially the same position in their Q-arrays. (If, on the other hand, an item is placed into a wide range of sorting categories by the different subjects, it can be said to have discriminatory potential.) When an item is a consensus item one possible interpretation is that the sorting group shares something in common, and the consensus items can be analyzed to identify basic cross-group similarities (or factors).

If the number of consensus items is very high, however, as it was in some of the articles studied, an alternate interpretation is possible--that the items were not very discriminatory. They were not "sensitive" enough to the issue to identify the real differences between sorters. The basic validity of a study is in question in such a

situation: do the results really measure what they say they do? Replication with an alternate set of items for underlying factor reliability amongst the sorters would seem appropriate for settlement of this question in a high consensus situation.

How high is "high"? This survey used a simple "guesstimate" guideline that more than 50% consensus might suggest another look at the item makeup, and possible replication, depending on the study. A good alternative, of course, would be to pre-test the items for their discriminatory potential.[47]

Subject Selection

The choice of subjects can help to assure that a sort will reflect what it is designed to do. Since the Q procedure is usually designed to provide data on personal attitude groups, and since it is usually not practicable to use Q with populations much over 200 because of the nature of the technique, and since it is often useful to have some foreknowledge of the characteristics of the persons who will do the sorting, subject selection should be purposive, rather than random, in most instances.

In addition the limitations to the generalizability of the findings should be noted. With Q one does not usually have perfect random samples of some vast universe. With subjects, as with statistics, a rough approximation is

sufficient for Q's purposes. What is essential when one chooses X to be part of the study is, as Stephenson puts it, "a good theory and faith that there are plenty more cases where X came from."[48]

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On the basis of the preceding discussion, and a review of the general literature on Q-method, the following "Criteria for the Assessment of Q-Technique with Communication Studies" have been compiled and applied to the thirty mass communications articles using Q which are reported in Appendix A (pages 54-57).

Criteria for the Assessment of Q-Technique with Communication Studies

I. Basic Considerations

1. The selection of Q for use with the study is justified. There is some explanation of "why Q", offered with respect to the particular study.

2. Individual persons accomplish the sorts rather than things or groups of people. (MacLean to the contrary;

see discussion on pp. 28-30.)

3. The similarity of persons is expressed "by a correlation based on ipsative scales, i.e., scales on which people have distinguished between items and not necessarily scales which distinguish between people on any normative basis of individual differences."[49]

II. Item Selection

1. The items are chosen so that "many statements do not matter to the subject, and so that there are as many for him to agree with as . . . to disagree with."[50]

2. If a forced bell-shaped distribution is used the items for sorting are not strongly dichotomous in makeup.

3. A structured design, such as balanced-block factorial design, is used for the selection of sort items; and if not balanced-block there is an explanation of the item selection process.

4. If an unstructured sort is used its limitations are noted.

5. The social desirability (sickness/health) variable is controlled for.

6. There are a sufficient number of items "for stability and statistical reliability, but not so many as to overwhelm the respondents. Probably from 55 to 75 items are ideal;"[51] 60 are usual;[52] and one can probably go as

low as 40 if the items are culled from a larger selection.[53]

7. The items are pre-tested for:

a) minimum amount of intra-subject variability (reliability)

b) maximum amount of inter-subject variability (discriminatory potential).

III. Subject Selection

1. The subject selection procedure is described or a rationale is provided.

2. The extent or limitations on the generalizability of the findings from the subject group is noted.

IV. Distribution Design

1. The shape of the distribution is supported by item design, i.e., a balanced-block design building in "neutrals" with bell-shapes; a dichotomous item makeup with a U-shape; a basically unstructured item makeup with a free sort.

2. There is an explanation given of why a particular shape was used.

3. A platykurtic distribution is used, rather than a strictly "normal" one, to enhance interitem discriminations.

4. There are a bare minimum of 9 sorting piles, or categories (but hopefully 11 or more).

V. Analytic Treatment of Data

1. The statistical limitations of Q-data per se, are recognized, (i.e., that Q data is not strictly parametric; or that the parametric correlation coefficients and factor analysis and/or analysis of variance are providing only approximate data when used with Q; or that "independence" is lacking in the decision-making, etc.)

2. The statistical tools for analysis are clearly identified. (Pearson's "r" and factor analysis are usually used and Stephenson recommends hand-rotation of factors. If some other tools or techniques are used their appropriateness for use with the study should be discussed.)

3. Analysis of Variance is not normally used because of lack of independence in the data and difficulties in establishing the equality of intervals and homoscedesticity.

4. IF ANALYSIS OF VARIANCE IS USED:

a) the level of significance is .01 or higher

b) a larger number of items is included in the sort; (cf. Item Selection II:6 above--probably 75 or so is sufficient.)

5. The factors are analyzed in terms of the postulated "theory" built into the set of items.[54]

6. If reliability was not established in pre-testing, there is some post-test measure of it.

7. Depending on study, more than 50% "consensus" items suggests a relook the item makeup and possible replication with alternate ems for verification through "factor reliability."

Discussion of Result : Techniques and Functions

Techniques

Thirty articles using Q or a clear variation thereof were published in English in the mass communications related journals during 1953-1972. The majority of articles followed the basic Q-sort pattern with persons sorting items into some kind of distribution on some given criterion. (These are marked with an "S" in Table 1). However at least three significant variations on the basic process occurred.

Table 1 about here

First, six articles (McGuire 19, Atwood and MacLean 22, MacLean et al 25; MacLean and Hazard 30 Harless 6 & 7) used a Modified-Free-Sort (MFS). In this approach persons do not sort items into a forced distribution on a comparative basis, but rather respond to a questionnaire (usually by mail) rating questionnaire items on some numerical scale (0 to 9 for example). The questionnaire data are later translated into a Q matrix/array and factor analyzed by the re-

searchers. MacLean noted that in some cases this method yielded highly similar results to the typologies gathered using the traditional Q-sorts.[55] He stresses that when using this approach it is important to provide instructions which encourage comparative responses to the items and which start the subject "thinking in a normal distribution pattern", such as :

> You'll probably find a few of these which you will want to agree with very strongly and a few which you will disagree with very strongly. Probably most will be intermediate for you. Read through all the items before you begin to rate them and then try to think of them in relation to one another.[56]

This approach has basic roots in Q. However, there are potential differences. The MFS uses a "free sort" pattern and relies on getting a "normal" distribution by virtue of the instructions and by chance. Also the item responses are probably not as directly comparable to each other as are "sort" responses. However the approach has the basic advantages of being generally faster and easier to administer; the study data can be secured by mail, and there can be a larger number of respondents.

When there are a large number of respondents, however, the basic factor analysis in an MFS study is often performed on only a portion of them. In the MFS studies

by MacLean, for example, the total respondents ranged from 304 to 637 (#22, 25, 30). However the number actually analyzed to identify factors, was similar to that used in a typical Q-sort operation: 100 or so. The additional respondents were later correlated with the factors.[57]

A second variation suggested by MacLean for working with Q in communication studies seems inappropriate. This is his suggestion that "in place of persons, we might use newspapers, communities, counties, nations--in fact, any units for which we can obtain systematic, codable descriptive data."[58] This sounds enticing--an application of Q to such things as content analysis for example. The approach was picked up by Jae-Won Lee (?) for a content analysis of "Editorial Support and Campaign News." His study seems to demonstrate the fallacy of this kind of approach to Q. The basic problem is that when data from some source other than a person is used, the absolute zero value, that Stephenson insists makes the scoring of different individuals comparable, is lost. With people one can assume that "the zero on all scales is the same absolute value for everyone"[59]--the point of not mattering. But how can one assert that about the content of a newspaper for example? What gets into newsprint is by definition something that matters. And the Lee study in fact attempted to "reduce the neutral category by making the assumption that exposure is a positive value."[60] When

such data is translated into a Q-array (a set of scores), the supposition of a neutral pile is hard to maintain.

In Lee's article there is no guarantee, and good reason to doubt, that the intervals between the piles in the Q array would be equal. With no zero point for comparison and the lack of an equal interval the data are clearly reduced to the level of ordinal ranks.

The basic fallacy is to assume that "newspapers are complex individuals with their own particular personalities" as Lee does,[61] or to assume the same thing about communities or counties or the like. It is handy to anthropomorphize non-human items and aggregates of people for ease of communication but once we fall into treating things or groups as individual people we have fallen for our own rhetoric--and taken analogies for truths.

With a sort by people the items are extraneous to the sorters--at least in the immediate test situation--and they can respond through all the degrees of attitude from pro through neutral to con. However, data that comprise both the items list and the "sort scores", have no neutrality. All of the items do matter in terms of the something, or else they would not be part of it. And the simple absence of an item from a source cannot be taken as meaning that it doesn't matter. In the example of the newspapers, the omission of some item from a given paper might reflect a negative bias such that the paper

intentionally omits it. The fact that the question of which omitted items "count" and which are of "no matter" can be seriously raised, indicates that a solid, comparable zero point among the "sorters" has been lost. It should be clear that there are serious deficiencies with this approach to Q.

Studies by Donahew and Singh (14), and Grunig (15) represent a third variation on Q which appeared in the literature. These studies differed significantly from the usual Q process. Rather than comparative ratings of items in a sort, or on a questionnaire form, these two studies utilized a series of test administered to the subjects. In Grunig's for example subjects were asked why they did or did not perform a particular activity and then their responses were coded by the researcher into one of four "decision categories". An average score for each category was determined, and the scores for the total group were factor analyzed. A considerable amount of normative data (expenses, taxes, etc.) was also collected and utilized. Donahew and Singh's study was similar.

While the subjects were analyzed into "types", and the data reflected some attitudinal preferences on the part of the subjects, those appear to be the only concrete connections to Stephenson's Q-method in these studies. The subjects were essentially rated for comparison. They did

not rate other things in a comparative manner. No distribution, forced or free, of comparative discriminations was involved; and the comparability of the subjects' data was certainly not based on any distensive zero point of neutrality, or "it doesn't matter."

For these reasons these studies probably do not belong in this survey. Donahew specifically disassociated his study from Stephenson's use of Q to align with the "Q" espoused by Cattell.[62] However it was felt that all studies which identified themselves as "Q" in the literature should be included for comprehensiveness and comparability and to avoid confusion. For purposes of identification these two studies were labeled with Catell's term: Q Factor Analysis (QFA).

With respect to the analytic treatment of data, the primary method was some form of factor analysis. Stephenson recommends hand-rotation of factors to allow for a more subjective, abductive approach to the data. But most of the studies herein used some other approach. Two studies (12, 19) used linkage analysis. According to McQuitty, linkage analysis "sometimes yields results very similar to, or identical with, those of rotated factor-analytic solutions."[63] Its primary assets are speed and objectivity. In addition a large number of studies made use of a computer program, QUANAL, or some sub-part thereof, developed by Norman Van

Tubergen of the University of Kentucky with Vincent Farace and Malcolm MacLean.

Functions

Q method was used in the mass communications literature to perform essentially five basic functions reflecting five basic questions. The functions, questions, and articles are identified below.[64] Some articles used Q in more than one way.

1) State-of-Affairs "Who thinks what about XYZ (a state of affairs, practice, or thing) and why?"

1, 3, 4, 5, 9, 19, 22, 25, 30.

2) Issues "Who has what preferences or attitudes on the issue (an "up-in-the-air variable of controversy") of XYZ and why?"

6,/7, 8, 9, 12, 20.

3) Gatekeeping "On what basis do they decide to use XYZ or not?"

10, 13, 16, 17, 21, 29.

4) Congruence "Does XYZ really reflect what ABC believes or prefers?" "How does ABC compare with himself on another sort?"

2, 11, 23, 24, 26, 27, 28.

5) Prediction "Who is best at predicting XYZ's preferences?"

10, 18, 21, 27.

State-of-Affairs and Issues studies were very much alike and together reflect half of the studies (9 + 6 =15). These all involved establishing "typologies" of persons. Harless (6/7) used this approach to determine groups for experimental study.

The Gatekeeping studies typically involved a magazine or newspaper and how the editors, or hypothetical editors, would determine which articles, pictures, etc. to include. Clyde and Buckalew quote MacLean to the effect that:

> The sorting procedure closely resembles the gatekeeper decision process. This is because the editor compares all the items in a given pool, then assigns them priorities or values.[65]

Editorial decisions were not the only use for this format however; Ellingsworth (29) tested the usefulness of various sections of a newspaper for teachers' classroom use.

The Congruence studies were some of the most interesting surveyed. Two of the experimental studies (11 & 26) which used Q as the primary technique and analysis of variance involved this approach. This function was also used in conjunction with content analysis (2, 23, 23, 28); a duo which provides solid data for beefing up the "so what" which can greet so many content analysis efforts. Ferrulo's use of this approach (26) was closest to the classic psychological self-ideal-self use of Q.

The Prediction studies are fairly self-explanatory. The basic thread in most was whether the people who are supposed to be predicting other people's preferences (i.e., editors) are any good at it. MacLean (27) portrays a novel approach for improving an editor's prediction quotient.

Discussion of Results: Methodological Criteria

Almost all of the Q studies surveyed satisfied the basic considerations. However, three studies, all of which used variations from the basic sort procedure, violated one or more of the basic considerations. Lee's (2) adoption of MacLean's suggestion, using things rather than real persons for accomplishing sorts, has already been criticized, (cf. pp. 28 & 30 above). Donahew and Singh (14) and Grunig (15) were also previously discussed (p. 25 above) and their differences from basic Q noted. Both used normative as well as ipsative data. They inherently did not build neutral elements into the data.

Table 2 about here

Use of a balanced-block design of some type was accepted as working to build in "many statements that do not matter" etc. on the basis of Stephenson's affirmation that such a design would usually take care of establishing

the distensive zero of the sort. Basically unstructured sorts were taken as not working in this manner. It should be noted that none of the authors studied explicitly stated that they were in fact trying to build such a pattern into the items.

On the whole a sufficient number of items were used in most studies to raise no questions about the instrument's ability to evoke a sufficient number of discriminations--similarly with the number of piles used. Those studies which were weak in these areas can be noted in Tables 1 and 3.

Table 3 about here

Subject selection procedures were generally described in sufficient detail (21 out of 30 articles) but there were very few comments about the limitations on generalizability. In fact about half of the studies, 16, rated only minimally OK; and this only because they did not extend their findings beyond the group studied or used tentative language such as "the data suggest that some XYZ's feel thus and so." These were accepted as implying limitations. A few however were quite specific, notably MacLean #30 and #25, Rucker #20, and Cathcart #12. Those who were rated negatively (x) on this criterion appeared to generalize their findings without noting any limitations.

Table 4 about here

The statistical limitations of Q data were essentially ignored or unrecognized by the bulk of the studies (24 out of 30). This is unfortunate since the studies appear in scholarly journals where other studies use the same statistical tools with assumptions of parametric precision that are not warranted in the case of Q.

Statistical tools were generally identified, although in a few cases little was said except that intercorrelations and factor analysis were performed. This was not considered sufficient since it is theoretically possible to use non-parametric factor analysis with Q[66] and there are various rotational procedures etc. which might evoke different kinds of factors. In any event replications and data verification checks would not be possible with such skimpy information.

Table 5 about here

On the whole it appears that, in communications studies at least, the warnings to stay away from analysis of variance with Q are generally being heeded. Only two studies used analysis of variance and both on the whole were quite well done (although Brown #11 had a relatively small

item sample). They noted statistical limitations, particularly re: independence of sorts, and both used the higher .01 significance level. Both were experimental designs. Ferrullo's (#26) was in fact one of the best designed and articulated studies surveyed with a very good introductory section on Q method.

The major, consistent, trouble spots have to do with item and shape design and the question of validity.

Two-thirds of the studies surveyed clearly built in some sort of structure to their item design (cf. Table II). Thus, in communication studies at least, items are not generally just "slapped together" as Milholland criticized.[67] However when an unstructured design was used there was no discussion of limitations which this might potentially present for a study. This absence of comment we would suggest as being related to a major problem--that a relation between distribution shape and item design is not generally recognized--or at least not verbalized. None of the studies surveyed contained any reference to such a relationship and in 4 out of 15 of the studies for which a clear yes/no answer was discernible, there appeared to be a conflict between item design and the shape chosen for the distribution (cf. Table 6). In judging the articles the use of a non-dichotomous structured sort was considered as providing "item-design support" for a forced bell-shaped distribution. Rucker's study (#20) was rated marginally acceptable in

this area. Although he used a basic dichotomy in the item design with an issue which was strongly dichotomous, he also balanced in other themes of relevance to the topic which probably served to mitigate against the sharpness of the dichotomy. A glance at Tables 1-6 indicates that, on the whole, the design of his study was quite good.

Table 6 about here

It should be noted that none of the studies reported any conscious attempt to build "neutrals" into the sort nor any recognition of a relation between the structure of the item design and the shape of the distribution utilized.

Only one study, (Ferullo # 26), offered any explanation of why a particular distribution was adopted. Of those using some variation of a bell-shaped curve, only two researchers came close to using a platykurtic distribution one of whom was Stephenson himself. It appears that on the whole Wittenborn's criticism that the quasi-normal shape is used generally, and without much thought as to why, seems warranted.[68] As was noted earlier, disregard for the link between shape and item design runs the risk of damaging the validity of a study.

The social desirability of the items for sorting (Table 3) was not mentioned in any of the studies and it can only be assumed that on the whole it was probably

never adjusted for, either before or after the sortings. This, if Edwards et al. are correct--and this survey found nothing in the literature to suggest that they aren't--is a serious omission and potentially calls into the question the validity of the studies.

Reliability is apparently all too often ignored in Q studies (Tables 3 & 5). Only one of those studies (Flynn #8) did an item reliability pre-test and none reported any post-test reliability check. Similarly the question of the discriminatory potential of the items was generally left untested; and in some cases it was an important question.

With respect to the level of consensus (all sorters sorting an item into essentially the same position) the studies ranged from a low of zero consensus (Ellingsworth #29) to a high of 76% consensus in the studies by Clyde and Buckalew (#16) and Buckalew (#17) (Table 5). Both of these appear to have used the same set of items, and 49 out of the 64 items were found to be consensus items in each case. As noted earlier, one has to ask whether such a result proves that the subjects were basically alike--or simply that the items were not very discriminatory. (It is to the authors' credit that they called attention to this question themselves.)[69] Replications of the aforementioned two studies should probably be performed before their re-

sults are relied upon.

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It appears on the basis of the preceding discussion, that the issue of what would be generally termed validity is a major trouble spot with Q studies in communications. Most of the serious problem areas have to do with item construction and shape of the distribution used. Control for the social desirability (sickness/health) of items seems to be the most regularly overlooked factor in item design, and a serious and potentially damaging omission in the communication studies using Q published thus far. Secondly the apparent lack of awareness of the relation between item design and distribution shape, which suggests a lack of awareness of the importance of "neutrals" in Q-sorts, is the major problem in the technical use of the method.

Apparently the majority of communication studies using Q methodology to date have relied largely upon a kind of "face" validity--basically assuming that "the thing just means what it says it means" and that people would just "naturally" sort things into a "normal" distribution. A review of the literature however, suggests that such assumptions about the workings of Q-method really cannot, and should not, be made without support. It is time that Q studies in mass communications research started to consciously build some validity support into their designs and analysis.

Summary

This study set out to review the uses and abuses of Q method in published communications research since the appearance of Stephenson's bench-mark text, The Study of Behavior, twenty years ago.

A number of methodological issues were discussed. The use of parametric statistics, free vs. forced sort, distribution shape, number and makeup of items, and subject selection, the importance of building items that "do not matter" into sorts, and the relation between distribution shape and item design were given particular attention.

The survey found thirty mass communications studies, published in English, in the scholarly journals related to mass communications. They used four Q techniques: 1) the Traditional Sort, 2) the Modified Free Sort using a questionnaire format, 3) a "MacLean" variation testing objects rather than persons, and 4) Q Factor Analysis, reflecting Cattell's rather than Stephenson's viewpoint on Q. The studies used Q for performing five basic functions: 1) State of Affairs preferences, 2) Issues preferences, 3) Gatekeeping, 4) Congruence, and 5) Prediction.

The studies were critiqued individually for their performance in five methodological areas: basic considerations, item selection, subject selection, distribution design, and analytic treatment of data. Methodologically the prime trouble spots were in 1) item design and 2) sup-

port for the choice of distribution shape. Validity should be a watch-word for future users of Q.

Overall Q-method appears to be a tool with a variety of uses for social research in mass communications; but this study suggests that its operative design must be properly constructed and the limitations of its statistical procedures clearly noted, if it is to be used most fruitfully.

FOOTNOTES

1 Lee J. Cronbach, "Assessment of Individual Differences", Annual Review of Psychology, 7 (1956), 176.

2 John M. Butler and Donald W. Fiske, "Theory and Techniques of Assessment", Annual Review of Psychology, 6 (1955), 331.

3 Huber W. Ellingsworth, "Teacher Preference for News Items Used as Class Materials", Journalism Quarterly, 40, 1(1965), 87-93.

4A Malcolm S. MacLean Jr., "Some Multivariate Designs for Communications Research", Journalism Quarterly, 42, 4 (1965), 618.

4B Wayne A. Danielson and G. C. Wilhoit Jr., A Computerized Bibliography of Mass Communication Research, 1944-1964 (New York: Magazine Publishers Association, Inc., 1967); Donald A. Hansen and J. H. Parsons, Mass Communication: A Research Bibliography (Santa Barbara, California: The Glendessary Press, 1968).

5 Steven R. Brown, "Bibliography on Q Technique and Its Methodology", Perceptual and Motor Skills, 26 (1968), 587-613.

6A William Stephenson, The Play Theory of Mass Communication (Chicago: The University of Chicago Press, 1967), p. 11.

6B Ibid.

7 Ibid., p. 17.

8 Ibid.

9 Ibid., p. 11.

10 Cf. William Stephenson, "Scientific Creed--1961", Psychological Record, 11 (1961), 15.

11 Stephenson, Play Theory, p. 16.

12 Cf. William Stephenson, "Independency and Operationism in Q-Sorting", Psychological Record, 13 (1963), 272.

13 Distensive Zero because "all the information...bulges out or distends from it--it is all contained in the dispersion about zero, that is, in the variance;" William Stephenson, The Study of Behavior: Q-Technique and Its Methodology (Chicago: The University of Chicago Press, 1953), 196.

14 Lee J. Cronbach and Goldine Gleser, "Assessing Similarity Between Profiles," Psychological Bulletin, 50 (1953), 456-473.

15 Leonard Freeman, "Religious Language--Understandability vs. Orthodoxy: A Q Study of Episcopal Parish Leaders in Sub-Urban Philadelphia" (unpublished graduate paper, Temple University, 1973).

16 Lee J. Cronbach and Goldine Gleser, rev. of William Stephenson, The Study of Behavior (University of Chicago Press), Psychometrika, 19, 4 (1954), 329.

17 Cf. Steven Brown, "On the Use of Variance Designs in Q Methodology", Psychological Record, 20 (1970), pp. 183, 187-188.

18 Cf. Stephenson, Play Theory, p. 20.

19 Cf. Stephenson, Study of Behavior, p. 343.

20 Butler and Fiske, op. cit., p. 332.

21 William Stephenson, "Comments on Cronbach and Gleser's Review of: The Study of Behavior: Q-Technique and Its Methodology", Psychometrika, 19, 4 (1954), 333.

22 Cf. Cronbach and Gleser "Review"; Walter S. Neff and Jacob Cohen, "A Method for the Analysis of the Structure and Internal Consistency of Q-Sort Arrays", Psychological Bulletin, 66, 5 (1967) 361-368; Fred N. Kerlinger, Foundations of Behavioral Research: Educational and Psychological Inquiry (New York: Holt, Rinehart & Winston, Inc., 1964), p. 594.

23 Brown, "Variance Designs", pp. 180-181. For a specific discussion by Stephenson along these lines cf. Stephenson, "Independency and Operationism".

24 Kerlinger, op. cit. pp. 594-95.

25 John Gaito, "Forced and Free Q Sorts", Psychological Reports, 10(1962), 254.

26 Austin Jones, "Distributions of Traits in Current Q-Sort Methodology", Journal of Abnormal and Social Psychology, 53, 1 (1956), 90.

27 Ibid., p. 92.

28 Cf. Kerlinger, op. cit., pp. 496-499; cf. also J. P. Guilford, Psychometric Methods, 2nd Edition (New York: McGraw-Hill, 1954), pp. 274 ff.

29 Statement by Malcolm S. MacLean Jr., personal interview, August 27, 1973.

30 Jack Block, "A Comparison of the Forced and Unforced Q-Sorting Procedures", Educational and Psychological Measurement, 16, 4 (1956), 484; George H. Frank, "Note on the Reliability of Q-Sort Data", Psychological Report, 2 (1956), 182.

31 Block, op. cit., p. 491.

32 Norman H. Livson and Thomas F. Nichols, "Discrimination and Reliability in Q-Sort Personality Descriptions", Journal of Abnormal and Social Psychology, 52, 2 (1956), 165.

33 Ibid., p. 164.

34 Jones, op. cit., p. 93.

35 Stephenson, Play Theory, p. 16.

36 Livson and Nichols, op. cit., p. 163. Livson and Nichols go on to suggest the use of a rectangular shape which allows for the maximum discriminations. However the bell-shape has certain computational advantages. For a discussion suggesting that for best results in factor analysis the distributions of scores should be forced to fit a bell shaped pattern, cf. L.L. Thurstone, Multiple Factor Analysis (Chicago: University of Chicago Press, 1947), p. 367.

37 Stephenson, Study of Behavior, p. 60.

38 Ibid., pp. 70-71, 77, 196; cf. also Brown, "Variance Designs", p. 182.

39 Kerlinger, op. cit., p. 587.

40 Allen L. Edwards and Paul Horst, "Social Desirability as a Variable in Q Technique Studies", Educational and Psychological Measurement, 13, 4 (1953), 625.

41 Allen L. Edwards, "Social Desirability and Q Sorts, Journal of Consulting Psychology, 19, 6 (1955), 462.

42 William S. Kogan, Robert Quinn, Albert F. Ax and Herbert S. Ripley, "Some Methodological Problems in the Quantification of Clinical Assessment by Q Array", Journal of Consulting Psychology, 21, 1 (1957), 60.

43 Edwards, loc. cit.

44 Kogan et al, op. cit., pp. 60-61.

45 Robert E. Harris, "Clinical Methods: Psychotherapy", Annual Review of Psychology, 7 (1956), 128.

46 Ibid.

47 For one method of testing discriminatory potential, cf. Richard A. Goodling and George M. Guthrie, "Some Practical Considerations in Q-Sort Item Selection", Journal of Counseling Psychology, 3, 1 (1956), 70-72.

48 Stephenson, Study of Behavior, p. 343.

49 J.R. Wittenborn, "Contributions and Current Status of Q Methodology", Psychological Bulletin, 58, 2 (1961), 136-137.

50 Stephenson, Play Theory, p. 16.

51 Mary Jane Schlinger, "Cues on Q-Technique", Journal of Advertising, 9, 3 (1969), 54.

52 Stephenson, Play Theory, p. 20.

53 Kerlinger, op. cit., p. 583.

54 Stephenson, Study of Behavior, p. 125.

55 Malcolm S. MacLean Jr., Thomas Danbury and John T. McNelly, "AEJ Members and Their Attitudes on Journalism Education Issues", Journalism Quarterly, 42, 1 (1965), 102.

56 Statement by Malcolm S. MacLean Jr., personal interview, August 27, 1973.

57 Ibid.

58 MacLean, "Some Multivariate Designs for Communications Research", p. 614.

59 Stephenson, Play Theory, p. 11.

60 Jae-won Lee, "Editorial Support and Campaign News: Content Analysis by Q-Method", Journalism Quarterly, 49, 4 (1972), 711.

61 Ibid., p. 715.

62 There are two different schools of Q methodology. Cattell considers Q to be basically the obverse of R factor analysis; Stephenson considers it to be much more. For a further elaboration of Cattell's viewpoint cf. Raymond B. Cattell, "The Three Basic Factor Analytic Research Designs--Their Interrelations and Derivations", Psychological Bulletin, 49 (1962), 488-520.

63 Louis L. McQuitty, "Elementary Linkage Analysis for Isolating Orthogonal and Oblique Types and Typal Relevancies," Educational and Psychological Measurement, 17 (1957), 207.

64 *Articles 14 and 15, both QFA, (see above) were omitted from this part of the analysis because of their radical procedural differences from the other studies. Both of these sought to establish "typologies" of persons.

65 Robert W. Clyde and James K. Buckalew, "Inter-Media Standardization: A Q-Analysis of News Editors," Journalism Quarterly, 46, 2 (1969), 349.

66 Cf. George A. Kelly, "Nonparametric Factor Analysis of Personality Theories", Journal of Individual Psychology, 19, 2 (1963), 147.

67 John E. Milholland, "Theory and Techniques of Assessment," Annual Review of Psychology, 15 (1964), 326.

68 Wittenborn, op. cit., p. 140.

69 Clyde and Buckalew, op. cit., p. 351.

Table 1

Techniques and Supplementary Data on
Communication Articles Using Q

	Technique	No. Items	No. Piles	No. Subjects	Distribution Shape
1-Kulfner	S	60	11	52	QN
2-Lee	M	90	-	10	-
3-Van Tubergen et al	S	30	9	24	N
4-Sanders	S	49	11	135	QN
5-Meyer	S	60	-	43	-
6/7-Harless	MFS	30	15	84	Free
8-Flynn	S	48	-	29	QN
9-Larkin	S	64/80	-	24	-
10-Atwood	S	54	11	53	QN
11-Brown	S	48	11	36	QN
12-Cathcart	S	48	11	32	N
13-Patterson et al	S	24	7	54	-
14-Donahew et al	QFA	41	-	163?	-
15-Grunig	QFA	62	-	88	-
16-Clyde et al	S	64	11	18	QN
17-Buckalew	S	64	-	12	-
18-Atwood	S	78	11	33?	QN
19-McGuire	MFS	32	9	55	Free
20-Rucker	S	56	11	42	Platy.
21-Lassahn	S	48	-	61	-
22-Atwood et al	MFS	48	9	467	Free
23-Clarke et al	S	30	5	40	Rect.
24-Bornholdt	S	48	-	80	-
25-MacLean et al	MFS	45	11	637	Free
26-Ferullo	S	100	9	60	QN
27-MacLean et al	S	60	11	34	QN
28-Stephenson	S	48	11	40	Platy.
29-Ellingsworth	S	60/60	-	22/24	N
30-MacLean et al	MFS	31	5	304	Free

Key:

S	= basic Q sort
MFS	= modified free sort
M	= MacLean variation
QFA	= Q factor analysis (Cattell)
QN	= quasi-normal distribution
N	= normal distribution
Platy.	= platykurtic distribution
Free	= free sort, no forced distribution
Rect.	= rectangular distribution
-	= data not provided or unclear

Table 2

Criteria Analysis-Basic Considerations

	1 Justification of Q use	2 Individual's sort	3 Correlation based on ipsative scales
1-Ruffner	*	*	*
2-Lee	*	x	x
3-Van Tubergen et al	*	*	*
4-Sanders	*	*	*
5-Meyer	x	*	*
6/7-Harless	*	*	*
8-Flynn	*	*	*
9-Larkin	x	*	*
10-Atwood	*	*	*
11-Brown	*	*	*
12-Cathcart	*	*	*
13-Patterson et al	x	*	*
14-Donahew et al	*	*	x
15-Grunig	*	*	x
16-Clyde et al	*	*	*
17-Buckalew	*	*	*
18-Atwood	*	*	*
19-McGuire	x	*	*
20-Rucker	*	*	*
21-Lassahn	x	*	*
22-Atwood et al	x	*	*
23-Clarke et al	x	*	*
24-Bornholdt	*	*	*
25-MacLean et al	*	*	*
26-Ferullo	*	*	*
27-MacLean et al	*	*	*
28-Stephenson	*	*	*
29-Ellingsworth	x	*	*
30-MacLean et al	-	*	*

Key:

* = Yes or present
** = Conditionally acceptable
x = No or not present
\- = Not applicable
? = Data unclear or unspecified

Table 3

Criteria Analysis-Item Selection

	1 Neutrals	2 Non-dichot.	3 Structured design	4 Unstructured limits	5 Social desirability controlled	6 Sufficient items	7a Reliab. pre-test	7b Discrim. potential pre-test
1-Ruffner	?	*	*	-	x	*	x	x
2-Lee	x	-	x	-	x	*	-	-
3-Van Tubergen et al	x	*	x	x	x	x	x	x
4-Sanders	?	?	?	-	?	*	?	x
5-Meyer	?	*	**	-	x	*	x	x
6/7-Harless	*	*	*	-	x	x	x	x
8-Flynn	*	*	*	-	x	*	*	x
9-Larkin	?	**	*	-	x	*	x	x
10-Atwood	*	*	*	-	?	*	?	?
11-Brown	?	*	*	-	x	*	x	x
12-Cathcart	x	*	x	x	x	*	x	x
13-Patterson et al	*	-	*	-	x	x	x	x
14-Donahew et al	x	-	x	-	x	**	-	?
15-Grunig	x	-	?	-	x	*	-	*
16-Clyde et al	*	*	*	-	x	*	**	x
17-Buckalew	*	*	*	-	x	*	x	x
18-Atwood	x	*	x	x	x	*	x	x
19-McGuire	*	*	**	-	x	x	x	x
20-Rucker	?	**	*	-	x	*	x	x
21-Lassahn	*	*	*	-	x	*	x	x
22-Atwood et al	?	-	?	-	?	*	?	?
23-Clarke et al	?	-	*	-	x	x	x	x
24-Bornholdt	*	*	*	-	x	*	x	x
25-MacLean et al	?	-	?	?	x	*	x	x
26-Ferullo	*	*	*	-	x	*	**	x
27-MacLean et al	?	*	?	?	?	*	?	?
28-Stephenson	*	*	*	-	x	*	x	x
29-Ellingsworth	x	?	x	x	x	*	x	x
30-MacLean et al	x	-	x	*	x	*	x	x

x = No or not present

? = Data unclear or unspecified

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Table 4

Criteria Analysis-Subject Selection

	1 Procedure described	2 Limitations noted
1-Ruffner	*	x
2-Lee	*	*
3-Van Tubergen et al	**	**
4-Sanders	*	*
5-Meyer	x	x
6/7-Harless	*	**
8-Flynn	*	*
9-Larkin	*	**
10-Atwood	*	**
11-Brown	*	**
12-Cathcart	**	*
13-Patterson et al	x	*
14-Donahew et al	*	**
15-Grunig	*	**
16-Clyde et al	x	**
17 Buckalew	*	**
18-Atwood	**	**
19-McGuire	*	**
20-Rucker	*	*
21-Lassahn	**	**
22-Atwood et al	*	**
23-Clarke et al	*	*
24-Bornholdt	x	x
25-MacLean et al	*	*
26-Ferullo	*	**
27-MacLean et al	**	**
28-Stephenson	*	*
29-Ellingsworth	**	**
30-MacLean et al	*	*

Key:

* = Yes or present
** = Conditionally acceptable
x = No or not present
\- = Not applicable
? = Data unclear or unspecified

Table 5

Criteria Analysis-Analytic Treatment of Data

	1 Q limits noted	2 Statistical Tools Identified	3 ANOVA	4a .01 level	4b Large no. of items	5 Factors related to theory	6 Reliab. post-test	7 50% consensus
1-Ruffner	x	*	-	-	-	*	x	?
2-Lee	x	*	-	-	-	*	x	*
3-Van Tubergen et al	x	*	-	-	-	-	x	*
4-Sanders	x	*	-	-	-	x	x	x
5-Meyer	x	**	-	-	-	x	x	*
6/7-Harless	x	*	-	-	-	*	x	-
8-Flynn	x	*	-	-	-	*	-	?
9-Larkin	x	x	-	-	-	*	x	?
10-Atwood	x	**	-	-	-	*	x	*
11-Brown	x	*	*	-	x	*	x	-
12-Cathcart	x	*	-	-	-	-	x	?
13-Patterson et al	x	x	-	-	-	**	x	?
14-Donanew et al	-	*	-	-	-	-	x	-
15-Grunig	-	**	-	-	-	-	x	-
16-Clyde et al	**	**	-	-	-	*	-	x
17-Buckalew	**	**	-	-	-	*	x	x
18-Atwood	x	**	-	-	-	-	x	*
19-McGuire	x	**	-	-	-	x	x	*
20-Rucker	x	*	-	-	-	**	x	*
21-Lassahn	x	x	-	-	-	*	x	*
22-Atwood et al	x	*	-	-	-	?	x	*
23-Clarke et al	x	x	-	-	-	*	x	?
24-Bornholdt	x	x	-	-	-	*	x	?
25-MacLean et al	x	**	-	-	-	-	x	?
26-Ferullo	x	*	*	-	*	*	-	-
27-MacLean et al	x	x	-	-	-	?	x	?
28-Stephenson	*	*	-	-	-	*	x	?
29-Ellingsworth	x	*	-	-	-	-	x	*
30-MacLean et al	-	*	-	-	-	-	x	*

Key: * = Yes or present x = No or not present ? = Data unclear or unspecified

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Table 6

Criteria Analysis-Distribution Design

	1 Item design support	2 Explanation for shape	3 Platykurtic	4 Sufficient no. of piles
1-Ruffner	*	x	x	*
2-Lee	-	x	-	?
3-Van Tubergen et al	x	x	x	**
4-Sanders	?	x	?	*
5-Meyer	?	x	?	?
6/7-Harless	*	x	-	*
8-Flynn	*	x	?	?
9-Larkin	?	x	?	?
10-Atwood	*	x	?	*
11-Brown	*	x	?	*
12-Cathcart	x	x	x	*
13-Patterson et al	-	x	-	x
14-Donahew et al	-	x	-	-
15-Grunig	-	x	-	-
16-Clyde et al	-	x	x	*
17-Buckalew	?	x	?	?
18-Atwood	x	x	x	*
19-McGuire	-	x	-	**
20-Rucker	**	x	**	*
21-Lassahn	*	x	?	?
22-Atwood et al	-	x	-	**
23-Clarke et al	*	x	-	x
24-Bornholdt	?	x	?	?
25-MacLean et al	-	x	-	*
26-Ferullo	*	*	?	**
27-MacLean et al	?	x	?	*
28-Stephenson	*	x	*	*
29-Ellingsworth	x	x	x	-
30-MacLean et al	-	x	-	x

Key: * = Yes or present ** = Conditionally acceptable x = No or not present - = Not applicable ? = Data unclear or unspecified

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APPENDIX A

Q ARTICLES IN COMMUNICATION RESEARCH

Articles are listed chronologically.
* = Research brief.

1972 1-Ruffner, Marguerite Anne. "Women's Attitudes Toward Progressive Rock Radio", Journal of Broadcasting 17:1:85-94. (State of Affairs)

2-Lee, Jae-won. "Editorial Support and Campaign News: Content Analysis by Q-Method", Journalism Quarterly 49: 4: 710-716. Followed MacLean's (#26) suggestion and used newspapers as "persons" and their performance scores in content categories as "test items". (Congruence)

3-Van Tubergen, G. Norman and Karen Friedland. "Preference for Comic Strips Among Teenagers", Journalism Quarterly 49:4: 745-750. (State of Affairs). *Unstructured.

4-Sanders, Keith P. "Q Study of Editors' Attitudes Toward Journalism Research", Journalism Quarterly 49: 3: 519-530. (State of Affairs).

5-Meyer, William G. "Q-Study of Attitudes Toward Rock Festival in Iowa Town", Journalism Quarterly 49: 2: 351-356. (State of Affairs).*

6-Harless, James D. "The Impact of Adventure Fiction on Readers: The Nice-Guy Type", Journalism Quarterly 49: 2: 306-315. See number 7.

7-_____. "The Impact of Adventure Fiction on Readers: The Tough-Guy Type", Journalism Quarterly 49: 1: 65-73. Q was used for assignment of subjects to experimental groups. (Issues).

1971 8-Flynn, James H. III. "The Ideal Television Station: A 'Q' Study", Journal of Broadcasting 16: 1: 65-77. (Issues).

9-Larkin, Ernest F. "A Q-Analysis of Values and Attitudes Toward Advertising", Journalism Quarterly 48: 1: 68-72. (State of Affairs; Issues).

1970 10-Atwood, Erwin L. "How Newsmen and Readers Perceive Each Others' Story Preferences", Journalism Quarterly 47: 2: 296-302. Editor were poorer predictors than were the other staffers of audience preferences. (Prediction; Gatekeeping).

11-Brown, Steven R. "Consistency and the Persistence of Ideology: Some Experimental Results", Public Opinion Quarterly 34: 1: 60-68. Comparison of Q sort replications over time. (Congruence)

1969 12-Cathcart, William L. "Viewer Needs and Desires in Television Newscasters", Journal of Broadcasting 14: 1: 55-62. Used linkage analysis and unstructured sort. (Issues).

13-Patterson, Joye, Laurel Booth and Russell Smith. "Who Reads about Science?" Journalism Quarterly 46: 3: 599-602. (Gatekeeping).*

14-Donahew, Lewis, and B. Krishna Singh. "Communication and Life Styles in Appalachia", Journal of Communication 19: 3: 202-216. Cattell's Q not Stephenson's, Identified types of individuals.

15-Grunig, James E. "Information and Decision Making in Economic Development: Journalism Quarterly 46: 3: 565-575. Design similar to Donahew's, #14.

16-Clyde, Robert W. and James K. Buckalew. "Inter-Media Standardization: A Q-Analysis of News Editors", Journalism Quarterly 46: 2: 349-351. 49 out of 64 items were consensus: standardization or non-discriminating items? (Gatekeeping).*

17-Buckalew, James K. "A Q-Analysis of Television Editors' Decisions", Journalism Quarterly 46: 1: 135-137. Probably used same items as #16. 49 consensus items out of 64 raises same question. (Gatekeeping).*

1968 18-Atwood, L. Erwin. "Perception of Television Program Preferences among Teenagers and Their Parents", Journal of Broadcasting 12: 4: 377-388. (Prediction).

19-McGuire, Delbert. "Democracy's Confrontation: The Presidential Press Conference, II", Journalism Quarterly 45: 1: 31-54. Attitudes of White House correspondents toward the practices for presidential press conferences. MFS Linkage analysis. (State of Affairs).

1967 20-Rucker, Bry[illegible] W. "What Solutions Do People Endorse in Free Pre[illegible]-Fair Trial Dilemma?" Journalism Quarterly 44: 2: 240-244. (Issues).

21-Lassahn, Pamela Henry. "Comparison of Judgements about

Agricultural Science News", Journalism Quarterly 44: 2: 702-707. (Prediction; Gatekeeping).

22-Atwood, L. Erwin and Malcolm S. MacLean Jr. "How Principals, Advisers, Parents and Pupils View Journalism", Journalism Quarterly 44: 1: 71-78. Used mail questionnaire. (State of Affairs).

1966 23-Clarke, Peter and Virginia Esposito. "A Study of Occupational Advice for Women in Magazines" Journalism Quarterly 43: 3: 477-485. Used Q sorts of readers' preferences as comparison against the findings of a content analysis. (Congruence).

24-Bornholdt, John N. Jr. "Should the Student Press Be More Serious?" Journalism Quarterly 43: 3: 560-562. Preference types compared with a content analysis. (Congruence).*

1965 25-MacLean, Malcolm S. Jr., Thomas Danbury and John T. McNelly. "AEJ Members and Their Attitudes on Journalism Education Issues". Journalism Quarterly 42: 1: 98-107. (State of Affairs).

1963 26-Ferullo, Robert J. "The Self-Concept in Communication", Journal of Communication 13: 2: 77-86. Q-sorts used to ascertain the congruence of self-concepts and personality traits of better and poorer speakers. One of the better designed and described studies. (Congruence).

27-MacLean, Malcolm S. Jr. and Anne Li-an Kao. "Picture Selection: An Editorial Game", Journalism Quarterly 40: 2: 230-233. The editors' ability to "predict" the preference of the "average reader"--before and after exposure to the readers sorts. (Congruence; Prediction).*

28-Stephenson, William. "The 'Infantile' vs. the 'Sublime' in Advertisements", Journalism Quarterly 40: 2: 181-186. Comparison of reader preferences to a content analysis. (Congruence).

29-Ellingsworth, Huber W. "Teacher Preference for News Items Used as Class Materials", Journalism Quarterly 40: 1: 87-93. (Gatekeeping).

1953 30-MacLean, Malcolm S. Jr. and William Hazard. "Women's Interest in Pictures: The Badger Village Study", Journalism Quarterly 30: 2: 139-162. Not strictly Q but an early form in which the rudiments can be seen for testing pictorial data for interest and

factoring for types. Good explanation of procedure. Forerunner of the "rated data later turned into a Q-array" (MFS) type of study. (State of Affairs).

APPENDIX B

METHODOLOGICAL ENTRIES ON Q

1-Anastasi, Anne. "Individual Differences", Annual Review of Psychology. 4: 137-156, (esp. pp. 144-145), 1953.

2-Block, Jack. "A Comparison of the Forced and Unforced Q-Sorting Procedures", Educational and Psychological Measurement 16: 4: 481-493, 1956.

3-Brown, Steven R. "Bibliography on Q Technique and Its Methodology", Perceptual and Motor Skills 587-613, 1968. A fairly exhaustive bibliography of the literature on Q to its date (1968) including sections on Social Research using Q. The basic bibliography.

4-_____. "On the Use of Variance Designs in Q Methodology", Psychological Record 20: 179-189, 1970.

5-Butler, John M. and Donald W. Fiske. "Theory and Techniques of Assessment", Annual Review of Psychology 6: 327-356, (esp. pp. 331-333), 1955.

6-Cattell, Raymond B. "The Three Basic Factor Analytic Research Designs--Their Interrelations and Derivations", Psychological Bulletin 49:499-520, 1962.

7-Cronbach, Lee J. and Goldine Gleser. "Assessing Similarity Between Profiles", Psychological Bulletin 50: 456-473, 1953.

8-_____. Book Review of "The Study of Behavior", Psychometrika 19: 4: 327-330, 1954.

9-Cronbach, Lee J. "Assessment of Individual Differences", Annual Review of Psychology 7: 173-196, (esp. p. 176), 1956.

10-Dahlstrom, W. Grant. "Personality", Annual Review of Psychology. 21: 1-48, 1970.

11-Edwards, Allen L. and Paul Horst. "Social Desirability as a Variable in Q Technique Studies", Educational and Psychological Measurement 13:4: 621-625, 1953.

12-Edwards, Allen L. "Social Desirability and Q Sorts", Journal of Consulting Psychology 19: 6: 462, 1955.

13-Eysenck, H.J. Book Review of "The Study of Behavior", The Journal of Educational Psychology 45: 6: 374-376, 1954.

14-Frank, George H. "Note on the Reliability of Q-Sort Data", Psychological Report 2: 182, 1956.

15-Gaito, John. "Forced and Free Q Sorts", Psychological Report 10: 251-254, 1963.

16-Goodling, Richard A. and George M. Guthrie. "Some Practical Considerations in Q-Sort Item Selection", Journal of Counseling Psychology 3: 1: 70-72, 1956.

17-Guttman, Louis. "An Outline of Some New Methodology For Social Research", Public Opinion Quarterly 18: 4: 395-404, (cf. n. 5), 1955.

18-Harris, Robert E. "Clinical Methods: Psychotherapy", Annual Review of Psychology 7: 121-146, (esp. pp. 126-128), 1956.

19-Jones, Austin. "Distributions of Traits in Current Q-Sort Methodology", Journal of Abnormal and Social Psychology 53: 1: 90-95.

20-Kelly, George A. "The Theory and Techniques of Assessment", Annual Review of Psychology 9: 323-352, (esp. pp. 330-331), 1958.

21-_____. "Nonparametric Factor Analysis of Personality Theories", Journal of Individual Psychology 19: 2: 115-147, 1963.

22-Kerlinger, Fred N. "Q Methodology", ch. 33, pp. 581-599, Foundations of Behavioral Research: Educational and Psychological Inquiry. New York: Holt, Rinehart and Winston, Inc., 1964.

23-Kogan, Leonard S. "Statistics", Annual Review of Psychology. 11: 199-224, (esp. p. 214), 1960.

24-Kogan, William S., Robert Quinn, Albert F. Ax, and Herbert S. Ripley. "Some Methodological Problems in the Quantification of Clinical Assessment by Q Array", Journal of Consulting Psychology 21: 1: 57-62, 1957.

25-Livson, Norman H. and Thomas F. Nichols. "Discrimination and Reliability in Q-Sort Personality Descriptions", Journal of Abnormal and Social Psychology 52: 2: 159-165, 1956.

26-MacLean, Malcolm S. Jr. "Some Multivariate Designs for Communications Research", Journalism Quarterly 42: 4: 614-621, 1965.

27 - McQuitty, Louis I. "Elementary Linkage Analysis for Isolating Orthogonal and Oblique Types and Typal Relevancies", Educational and Psychological Measurement 17: 207-229, 1957.

28 - Milholland, John E. "Theory and Techniques of Assessment", Annual Review of Psychology 15: 311-346, (esp. p. 326), 1964.

29 - Neff, Walter, S. and Jacob Cohen. "A Method for the Analysis of the Structure and Internal Consistency of Q-Sort Arrays", Psychological Bulletin 68: 5: 361-368, 1967.

30 - Nordenstreng, Kaarle. "Communication Research in the United States: A Critical Perspective", Gazzette 14: 3: 207-216, (esp. p. 213), 1968.

31 - Schlinger, Mary Jane. "Cues on Q-Technique", Journal of Advertising 9: 3: 53-60, 1969. A soup to nuts crash course in how-to-do-it. The best of its kind. A must.

32 - Stephenson, William. The Study of Behavior: Q-Technique and Its Methodology. Chicago: The University of Chicago Press, 1953.

33 - _____. "Comments on Cronbach and Gleser's Review of: The Study of Behavior: Q-Technique and Its Methodology", Psychometrika 19: 4: 331-333, 1954.

34 - _____. "Independency and Operationism in Q-Sorting", Psychological Record 13: 269-272, 1963.

35 - _____. "Scientific Creed--1961" (in 3 parts), Psychological Record 11: 1-25, 1961.

36 - _____. "Operational Study of a Occasional Paper on the Kennedy-Nixon Television Debates", Psychological Record 14: 475-488, 1964.

37 - _____. The Play Theory of Mass Communication. Chicago: The University of Chicago Press, 1967.

38 - Travers, Robert M. W. "Individual Differences", Annual Review of Psychology 6: 137-160, (esp. pp. 147-148), 1955.

39 - Wittenborn, J. R. "Contributions and Current Status of Q Methodology", Psychological Bulletin 58: 2: 132-142, 1961.

40 - Brown, Steven R. and Donald J. Brenner (eds.). Science, Psychology and Communication: Essays Honoring William Stephenson. New York: Teachers College Press, Columbia University, 1972.

APPENDIX C

PROCEDURE AND INSTRUCTIONS FOR INTER-CODER RELIABILITY

A Ph.D. student in communications was selected to be alternate coder. He was provided with the following instructional materials:

A) The methodological discussion (pp. 4-22) with all references to articles-to-be-coded deleted.

B) The list of criteria (pp. 23 ff.)

C) Supplementary instructions for coding as follows:

Criteria II: 1. Use of a balanced block design of some type was accepted as working to build in "many statements that do not matter" etc. on the basis of Stephenson's affirmation that such a design would usually take care of establishing the distensive zero of the sort. Basically-unstructured sorts were taken as not working in this manner.

Criteria IV: 1. In judging the articles the use of a non-dichotomous structured sort was considered as providing "item-design support" for a forced bell-shaped distribution.

Criteria V: 2. When statistical tools were identified only to the extent that intercorrelations

and factor analysis were performed, for example, this was not considered sufficient since it is theoretically possible to use non-parametric factor analysis with Q and there are various rotational procedures etc. which might evoke different kinds of factors. In any event replications and data verification checks would not be possible with such skimpy information.

The alternate coder was then provided with three non-communication Q articles for practice.

1) Marven O. Nelson and Edward Morris, "An Application of the Q-Technique to the Study of Religious Concepts", Psychological Reports, 3 (1957), 293-297.

2) Bernard Pyron, "Belief Q-Sort, Allport-Vernon Study of Values and Religion", Psychological Reports, 8 (1961), 399-400.

3) William Van Dusen and William Rector, "A Q Sort Study of the Ideal Administrator ", Journal of Clinical Psychology, 19, 2 (1963), 244.

These were coded and then discussed with the author for clarity of criteria. The alternate coder was then assigned the thirty articles for coding. His codings were compared to those of the author. The results appear on p. 3 of the text.