CHAPTER IV

Q-METHODOLOGY: ISSUES AND ALTERNATIVES

Some people think that Scientific Research is basically a fact-gathering activity. It is not only so.

- M. Cohen

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CHAPTER IV
Q-METHODOLOGY : ISSUES AND ALTERNATIVES

In the last fifteen years many scholars have tried to study the impact of innovations in the field of education. The present investigator has followed the footsteps of the earlier researchers and selected the field of innovations particularly with reference to the administrators in the State of Gujarat. Main stress has been given to study the personality dimensions of the innovative administrators to keep the study in manageable limits. For such a study two methods generally employed are R-methodology and Q-methodology. In this study the investigator has employed Q-methodology.

4.1 History of Q-Methodology

Psychologists and sociologists have tried to discover the laws that cover all individuals. The formulation of such laws and their application in general, have been disputed by psychologists. Man cannot be categorized by a behavioral pattern. Different individuals behave differently. Traven (1964) studied the subject and concluded that the unique behaviour of an individual can be described under the ideograph laws. It differentiates the individual from the mass. Earlier Allport had also worked in that direction and laid much emphasis on the ideographic laws. He described nomothetic laws:
"The piling of law upon law does not in the slightest degree account for the pattern of individuality which each human being enfolds. The person who is unique, and never repeated phenomenon, evades the traditional scientific approach at every step. (4-5)

He pointed out the differential behaviour among the individuals, which has been a major problem for the psychologists. For Allport it was difficult to measure the individual traits of individuals. It was Mokinnon (1938) who went ahead and showed that handling a series of test situations, some individuals were consistently honest, others consistently dishonest, and still others showed great variability of performance. But still it is difficult to formulate single traits to determine the behaviour of an individual. After the studies of Mokinnon, Allport tried further and suggested that individuals might be grouped into types. Each would consist of those whose laws of behaviour were closely related. He felt the necessity of developing a technique of sorting individuals into types.

The onus of developing that technique fell on Stephenson (1953). He approached the problem from a new angle. He invented the structured behaviour sample, which offers the hope of identifying the set of traits which are useful in characterizing the individual. Later on he developed the technique and called it Q-methodology. He also proposed to apply factor analysis to the problem of
categorizing individuals in a group of persons whose behavior can be understood in terms of particular patterns of traits. In the Q-methodology one can approach a problem through either of the two ways - ideographic or nomothetic.

4.2 Ideographic Versus Nomothetic Approach

The former relates to the process of discovering psychological relationships or phenomenon by using groups of organisms, the later approach is the process of determining many relationships in respect of an individual by means of intensive studies. Underwood (1957) remarked "the idea is that we should discover the laws holding for the individual, not the laws holding for the group."

Skinner and Ebbinghaus have formulated many generalizations in the areas of learning and memory respectively by means of ideographic analysis. Numerous studies have been made by applying both the approaches. But McClelland (1963) favours the nomothetic approach:

"One of the knottiest problems in the psychology of personality is the relationship between general laws ..... laws which are established for groups of individuals, and their application to the individual person ..... Most laws in psychology would seem to be nomothetic." (p. 89).

But he does not give up the ideographic approach. He sounds conciliatory when he says:
"We need not conclude that we must have two different kinds of laws. We may need only to make an ideographic application of the nomothetic law or laws." (p.90)

So is the case with Barron (1969) who would like to have both the approaches. According to him the ideographic approach describes:

"the individual in his unrespectable, unexampled, uniqueness, while the nomothetic describes him in relation to other human beings on hypothesized dimensions of personality ..... The fact is that this opposition is with us constantly in all our thinking and is indeed basic to the nature of perception and thought..... The study of psychic creation .... requires our attention to both the ideographic and the nomothetic." (p. 11)

Lykon is also of the same opinion. He also does not see any controversy in it. He says that both the approaches are complementary.

4.3 Basic Issues in the Present Study

The present investigation deals with the behaviour characteristics of the innovative educational administrator. The following problems cropped up in the initial stages of the investigation:
The problem of the selection of methodology

The problem of the selection of subjects

The problem of the selection of the tool

The problem of deciding factor analysis.

4.3.1 Issues in Selection of Methodology

According to Fruchter (1954) there are six different ways of studying co-variations in tests, persons and occasions:

Q-technique
R-technique
O-technique
S-technique
T-technique

It would be appropriate here to review the other techniques besides the Q-technique. The above six techniques can be grouped into three pairs in such a way that each pair would consist of mutually transpose-inter-correlational technique.

Pair I: Q- and R-technique

(i) **Q-technique**: By this technique one can indicate how two or more persons vary over a series of tests administered at a time. It is an average of all the tests and so one should not say that it is one test, as it consists of a series of tests. This technique is very useful where some
kind of 'person continuum' can be assumed and the various "tests" are placed on his continuum. The various "scores" are, consequently, in terms of the same units (e.g. the person's preference) and can be averaged. This type of measurement utilized in this technique is called introspective (i.e. relative to the self) as contrasted with the normative (i.e. relative to the group).

While Cattel is all for Q-methodology. He remarks:

"Q is unique however, in ..., systematically using a procedure, that sacrifices level and Q is unique, however, in ..., systematically using a procedure that sacrifices level and scatters all individuals. All individuals have the same general mean and the same general standard deviation. When sets of scores have these two characteristics they are called inspective scores, in contrast to normative scores, which are the usual scores derived from tests and scales. (p. 596).

According to Travers (1964) the factors derived from Q-technique (observe factor analysis) have persons loaded on them and each factor represents a hypothetic person of a given type.

It was concluded by Anastasi that there was a forced choice distribution in Q-technique, the Q-sort yielded inspective rather than normative data. There the individual only tells his strong and weak traits, but not how strong he believes himself to be in comparison to another person or some outside norm.
Lanyou and Goodstein (1971) think that they provide relative data about the group under study, and do not tell how the group would compare with any other group along with some absolute dimension of the trait or how an individual from the group would be compared with an individual from another group.

(ii) **R-Technique** :

Many scholars have used this technique specially in working out correlation of tests administered to a sample of persons on a single occasion. The test is conducted on a series of persons at a time or in similar conditions. The scores of all persons are averaged. Fruchter (1954) believes that the transpose of this technique is the **Q-technique**.

**Pair - II : Q - and P - technique**

(a) **Q-Technique** :

It involves the correlation of occasions for a series of tests for one individual and is transpose of the **P-technique**. It indicates the extent to which different occasions influence the performance of a person. To study the variations in an individual's behaviour this method is useful. The series of test need averaging.
(b) **P-technique**

This is a widely used technique in the study of human behaviour. Burt, Cattell and Rhymen (1947) were the first to use the technique. It consists of correlation of a group of tests over a series of occasions administered to one person. It helps to determine whether any of the tests of a battery covary in time if its administration is reported on the same individual. This approach is specially useful with dynamic variables, such as personality traits that do fluctuate with time. It also helps to identify and confirm the factors obtained from R-technique.

**Part III : S-and T-technique**

(a) **S-technique** is used to determine the extent to which two or more individuals vary together over a series of occasions or trials on the task. It helps to know group homogeneity with special reference to a given trait over a series of occasions. Traits which vary in the individual on different social situations, would be most appropriate for this type of analysis also. Varying the occasions in a systematic or controlled manner would probably lead to the most "meaning person" factors.

(b) **T-technique**:

T-technique, the transpose of S-technique, indicates how two or more occasions covary over a series of individuals.
as one test, such as in the test-re-test (reliability) situation. The approach is useful for determining the basic types of occasion factors, affecting performance test.

Fruchter has compared the P, Q, and R-techniques. He has indicated that R-technique is frequently utilized in correlation studies, the other kinds of correlation technique such as P-technique and Q-technique could also be applied. He remarks that the:

"Analysis of a matrix of Q-correlation Co-efficients has been variously referred to as inverted, inverse or observe factor analysis, since the roles of tests and persons are inter-changed as compared with the more conventional R-technique (p.176).

In his comparison of R and Q-technique Guilford (1954) has indicated that if there is a matrix of scores showing columns for tests and rows of persons, the correlations in the R-technique would be between the rows, or in other words between persons.

Stephenson (1959) summarizing the quantitative principles of the R and Q-technique, has given the following postulates:

R-technique Postulates

(a) The populations are group of persons.
(b) Each variate has reference to an attribute or characteristics of such persons.

(c) These variates do not interact according to the rule of the single variable.

(d) The transitory postulate (namely, if $x, x_m, y, z$ than $yz$ ) proceeds in terms of individual differences.

(e) Scores are reduced to standard scores with respect to each variate, for the sample of persons concerned.

(f) These scores are approximately normally distributed with respect to the sample of persons.

(g) All the important information for each array contained in its variation (no information is lost in throwing away the variate means).

(h) The concern is with inter-dependency analysis (p. 56)

Q-technique Postulates

(a) The population are groups of statements or the like.

(b) Each variate has reference to an operation of a single person upon all the statements in one international setting.

(c) The variables may interact in the one interactional setting.

(d) The transitory postulate has reference to intra-individual differences (such as 'significance').
(e) Scores are reduced to standard scores to each
person-array.

(f) Scores are approximately normally distributed with
respect to the person-array.

(g) All the important information for each array is in its
variation (no information is lost in throwing away the
vastate means).

(h) The statements of a sample may interact.

(i) The concern is with dependency analysis.

Here, it would be interesting and also pertinent to
reproduce the chart given by Stephenson (1953) to clarify
the statistical status of the Q-technique.

THE CHART

Multivariate Analysis

Dependency analysis

Variance & Dependency
covariance analysis
Factor analysis

Fisherian methodology

Q-methodology

Q-variate designs

Q-technique

(variance analysis
Centroid, Bi-factor
Spearman).

Inter-dependency analysis

Component analysis

R-methodology

R-variate designs
(Cattell's P.T.O. etc.)

R-technique
(Principle axes,
Centroid, Bi-factor,
Spearman).
Salient Characteristics and Properties of \( \Phi \& R \)

The basic postulates of \( \Phi \)-technique is the individual difference; and all generalizing and theorizing in respect of behaviour depend upon the basic assumption. The operations of the \( \Phi \)-technique require the studies to be conducted on a large number of subjects (persons) so that the conclusions arrived at by the utilization of factor analysis might be held to be safely generalizable in respect of the universe from which the sample is drawn. The measurement strategy in the \( \Phi \)-technique requires quantification and definition of the norms of the name of scientific inquiry, a heavy premium is placed on what might be called objectivity, and this necessitates observation of the behaviour in terms of overt, rather than covert (or subjective) reactions which characterize the attributes under the study. There is no consideration of the inner experiences or feelings of the self, as it is not available for scientific study. And the inner experience is limited to the person who possesses the psychological attributes of some measure which would readily be identifiable by means of the traditional factor-analytic technique. The derived factors get their scientific sanction on the basis of "communality", observable amongst a number of tests, and again, on this basis their invariance is inferred. There is no doubt that man has multiple attributes and \( \Phi \)-technique deals with the listing of all men's characteristics and seeks to reduce these as an atom-like order.
What is achieved in this way in principle, is important, because there we find man's potentialities and capacities.

Stephenson finds the Q-technology defective for the study of the concrete behaviour of an individual. He holds that it would be a lopsided assumption to conceptualize human behaviour purely in terms of external observable (to others) response. Behaviour should include the inner experience of man which is as important as the outward behaviour. Joining issues with introspective psychology, the Q-methodology does not distinguish between "what is subjective, such as thinking, and what is observable to others, such as playing golf". He asserts the thesis is for scientific purposes.

"dreaming is as much behaviour as is jumping a style of dashing a hundred yards. All is a matter of interacting with this or that situation. Inner experience and behaviour are thus alike. Both are matters for objective, operational, definition and study." The "reductionism" or the "elementalism" which conceive "man as a mass of characteristics" is unacceptable to both Ward (1933) and Stephenson (1953).

It is also a known fact that in the R-technique, factors or their combinations are concerned with "communal- lity" only whereas in the Q-technique that part, which is
regarded in the R-technique as "specificity" and discarded, is of utmost concern. It is, however, recognised even by the R-factorists that it is perhaps this "Specificity" which accounts for the uniqueness of a person's personality. Stephenson (1953) holds that:

"It is theoretically possible for a person to be so unique that no other person can be found to correlate with him, in this case all the variance will be specificity." (2. 284)

Strength and weakness of Q-methodology

Stephenson's claims have been challenged by Eysenck (1960). He remarks:

"In summarizing Stephenson's contribution, we must note that all the studies reported by him are merely illustrative, and that until a large scale, properly planned and executed experiment is reported, however, there are certain features, both in the experimental design and the statistical treatment, which throw very great doubt on the results. (p. 404).

After comparing the various techniques he concludes:
"We may say, therefore, that if the process of correlating persons has any major and novel significance in the field of personality study, it must lie in the fact that it gives rise to factors which could not have been discovered in any other way, i.e. general factors describing overall similarities between people's reactions. (p. 410)

Reviewing the Q-technique Kerlinger (1964) remarks:

"Q-methodology is controversial. It has been highly praised and harshly criticised. The truth of the critical matter is probably that the method is not as powerful and all embracing as Stephenson has claimed it to be, nor is it as poor and defective as some critics have it is. It is probably safe to say that Q is a flexible and useful tool in the armamentarium of the psychological and educational investigator. (pp. 592-593).

According to him the following are the strengths and weaknesses of Q-methodology:

(a) It has close affinity to theory. Structural Q sorts by definition, are theoretically oriented. In order to build a structured sort, one has perforce to enunciate some kind of theory.

(b) There are all possibilities of Q for the objective study of the individual in more than test score fashion. Q-methodology is suited to intensive study
of the individual. One individual can be given two, three or more related Q-sorts many times. The data of such sortings can be analyzed quite objectively without entirely sacrificing the richness of the usual clinical and much less objective methods.

(c) Q is used to test the effects of independent variables on complex dependent variables. With Q, one can rather sensitively assess the changes of single individuals by using analysis of variance and factor analysis of the data of structural Q-sorts. It holds great promise for experimental, social psychological and educational studies.

(d) It is useful in exploratory research. It may at least give a good start to its empirical testing. Similarly, we may be able to lay out the operational structure of speculative and theoretical formulations in education. The reality of empirical data can help one refine the theory or discard it, if need be.

(e) Q-sorting is interesting to subjects: most persons seem to enjoy sorting Q-decks, perhaps because the method is realistic as well as challenging. Factor arrays are an important contribution to analysis and interpretation. The salient parts of factors are laid out for us to see and interpret. One observes the verbal or other expression of the essence of whatever it is, that is common to several individuals.
(f) Regarding the matter of sampling of persons, one can really work with sufficiently large samples in Q. It is not well suited to cross-sectional or large sample purposes. It does not work with a random sample of persons for the study with Q. No matter how promising Q-results may be, one cannot escape the necessity of testing theory on a large number of individuals.

(g) In Q the placement of one card somewhere along the continuum should not affect the placement of other cards. If Q-placements affect each other, the independence of assumption is violated. This happens in all forced choice procedures.

(h) It has been said that its forced choice procedure is unnatural, that it requires the subject to confirm to an unreasonable requirement. The forced choice constraint of Q-sorts has also been criticised by some subjects. Furthermore, important information about one's elevation and scatter is said to be lost with the forced Q-procedure. The Q-procedure throws away levels of difference between individuals.

On the constraint argument, all psychometric procedures are constraints on the individual. Because an individual feels constrained or pinched in sorting Q-sorts, however, is not a really good reason for declaring the procedure invalid. The experience of the present investigator
is that very few individuals complain about the procedure. Most of them seem to like it.

But there is no doubt in the fear that there is a loss of information in the process of Q-sorting. Some people have pointed this flaw in the Q-technique.

Tyler (1959) has described the Q-sort method as the "best known of the new methods developed by psychologists in the recent years for the assessment of the unique ways in which individuals organise their experiences, which describes the uniqueness of each individual personality". p.23.

"It is credible" writes Verma (1965) "that a hypothetical factor among several persons may be found and may represent a sort of personality that is central to the persons correlated. Q-technique is of interest to psychologists in the field of personality and clinical work."(p.124).

Helmstadter (1966) writes eloquently about the utility of this technique and its promising future, in the computer age, in the following words:

"When properly carried out, the Q-sort would seem to be one of the best approaches devised to obtain a comprehensive description of one individual. Because this technique does require considerable effort in the original scale preparation as well as raters who will give careful consideration to a long list of behaviours for each person to be rated, the Q-sort has not yet received the popularity it deserves. However,
with modern computers a Q-sort deck can be "distilled" in such a way that a great deal can now be accomplished with a relatively small number of items. Thus, it is possible that the Q-sort will become one of the most widely used ways of rating persons in school or on the job, as well as in research situations .... (p. 190)

Fox (1969) uses the term interchangeably and highlights the advantages of the Q-sort as sophisticated ranking procedure useful in educational research for "ordering concepts".

Phillips (1971) briefly observes that a Q-technique is subject to same kinds of assumptions of theory as the traditional factor analysis. He further points out that despite some controversy over its status Stephenson (1963) holds the view that the traditional factor analysis and Q-technique differ in important ways in psychological, logical, and methodological principles.

4.3.2 Issues in the Selection of Subjects

The selection of subjects for Q-sorting is a tricky problem. This study explores and analyses certain personality dimensions which are supposed to be relevant to the innovativeness as indicated by research findings.

The phrase "innovative Educational Administrator" indicates the peculiar and outstanding group of the
the administrative society. It suggests that in the testing for innovative educational administrator the two aspects should be taken care of viz., (1) the innovativeness and (2) the other human attributes or characteristics.

Firstly, it would be seen that the word "Innovativeness" is attached to different areas of fields. The term has already been defined above, but still it may not be out of context to quote Rogers (1969):

"Innovativeness is defined as the degree to which an individual is relatively earlier in adopting new ideas than the other members of his social system." (p. 10)

As the investigation is to be carried in the field of educational innovation, it was difficult for the investigator to miss this aspect of innovativeness in the measurement of innovative educational administrator.

The problem can be approached from three directions:

(a) the process approach,
(b) the person approach, and
(c) the product approach.

These approaches have been made by the investigator with the help of Q-methodology. "Person", 'process' and 'product' have been taken care of.
The conditions, both external and internal under which administrative decisions take place, will be treated as far as possible. It includes both psychological processes and socio-physical environment factors and their many internationalship. In the earlier studies done in the field of education vis-a-vis teachers, scholars have laid stress on proper psychological functioning, including sensory process, neurological processes, circulating processes, digestive processes, excretory processes and glandular processes as a basic source of conditions that limit and facilitate efficiency in teaching. They constitute the most important single source of causes of efficiency and inefficiency in educational administration.

Another critical point in human behaviour and efficiency will be found in the ties that have been established between physical and symbolic manipulation in each individual administrator's way of thinking and behaviour. Possibly a study of just how educational administrators perceive the many things associated with the administration of educational institutions is necessary.

The above survey of various technique reveals that the researcher who tries to assess human abilities must be equipped not merely with lists of the concomitants of ability but he must have ideas about how they are categorized and structured. One of the theories about structure is that ability can be thought of as some general power.
(Spearman called this general factoring) plus a jest of special capabilities. Other theories emphasize the importance of group factors.

Thorndike emphasised the dimensions of breadth and depth. Guilford has pursued this matter intensely for many years and has suggested a much more elaborate structure. It would seem that the researcher in this area must give some consideration to structure.

The researchers involved in the Wisconsin studies appear to be generally familiar with the theories of the structure of human abilities, but their specific assumptions in their respect are frequently setforth. From Wisconsin, Barr (1961) concluded that the talents of individuals are highly diversified and that it is doubtlessly psychologically unsound to expect many high level talents in any particular individual or that they will be highly intercorrelated. It can be assumed that there is a considerable number of talented educational administrators. In the light of the current theories of the structure of human abilities it can be hypothesized that administrative ability is composed of some particular combinations of special and general abilities.

Stephenson (1953) has his own doubts about the capacity of a R-factorist or a learning theorist or a phenomenologist to explore the characteristics of the outstanding personalities
in a worthwhile and penetrating way as the biographers do. He emphasizes that personality studies must be concerned with the characteristics of a concerned person, on this in turn, very much demands an ideographic approach. Agreeing with Allport (1937) he further emphasizes the need for the studies of the uniqueness or the distinctive quality of eminent personalities rather than merely compiling a list of all their numerous attributes. He writes:

"We now see clearly that this is not the same thing as an account of the vast assemblage of personal qualities that are such a person's capabilities, potentialities, and the like, for these have no better status than his bank book, his motor-car, or his other worldly possessions. It is what he does with such possessions and dispositions, if anything, that might be of interest for a study of the personality (pp. 288-89)."

Advocating penetrating studies of such personalities, comparable to the incisiveness of psychoanalysis, Stephenson (1953) urges researchers to undertake studies "along lives of testable propositions and Q-methodology". (pp. 288-89).

In Stephenson's scheme "much more can be learned about personality from careful exploration of a few really interesting people such as a Kierkegard, a Churchill, or an Einstein." (p. 290).
Stephenson has also pointed out that American behaviourism is also returning, to the same position which seeks to give adequate recognition, to the self of psyche. For these reasons, the investigator is not inclined to concede a prior claim to be the nomothetic approach in this investigation. Broad generalizations emerging from the factor analytic studies in this research would be indicated to pin-point such verifiable propositions as might indicate patterning of specific attributes. There would, therefore, be no attempt towards having any large scales, normative sampling and exhaustive listing of relevant and irrelevant attributes, capacities and potentialities of the innovative persons studied.

Guilford (1971) also expresses a similar view with respect to testing for creativity. He points out that "creativity is an ambiguous word, but when it is used in phrase 'testing for creativity' its meaning may be restricted to those qualities or traits of individuals that predispose them to produce novel ideas and novel effects." (p. 557).

Keeping the above observation and the limitation of the creativity tests, Jha (1974) used the nomination method for the selection of highly creative individuals and the Q-technique was found suitable for his investigation to study the creative individuals residing in Western India.
As there was not a single task for innovativeness of an educational administrator, the present investigator could not make the use of one to select the innovative administrators as the subject. So far the purpose, it was thought worthwhile to adopt the nomination method for the selection of highly innovative individuals on the opinion and judgement of different persons in the educational field of Gujarat as the chief criterion for selecting the subject. The investigator has also used the eye for validation possibilities as a criterion to select the subject, as suggested by Stephenson.

Along with the problem of selecting the innovative individual, the number of subjects (i.e. size of the subject sample) to be selected for the study was also a problem for the investigator.

4.3.3 Issues in Selecting the Tool

According to Stephenson Q-technique is composed of statements, art subjects, descriptions of behaviour and personal traits, and it seemed almost impossible to define population universes for them or to provide an acceptable basis for sampling that might so be defined. Here, in this study, the tool comprises of the statements describing the characteristics of the innovative educational administrators.
Before talking about the nature of the tool used in the present investigation, it is quite proper to discuss here the structured and unstructured Q-sorts. According to Kerlinger (1964), most published Q-studies have used unstructured Q-sorts. Kerlinger thinks that most published Q-studies have used unstructured Q-sort i.e. a set of items assembled without specific regard to the variables or factors underlying the items. Theoretically, any sample of homogeneous items can be used in an unstructured Q-sort and it has been done by Rogers and Dymond (1954). A large number of items specially constructed by the researcher are put together in a Q-sort. The items of unstructured Q-sort are like the items of personality or attitude scale. There is a theoretical infinite population of items, and the assumption is that the set of items used by the investigator, \( Q \)-sort is random \) and thus represents the sample of this item population.

In structured Q-sort the variables of the "theory" or a hypothesis or a set of hypothesis are built into a set of items along Fisherion experimental and analysis of variance design principles. This means the theoretical principles behind the unstructured Q-sort calls for random sample of items from a population of such items. No pretence is made that the theory is built into the Q-sort. Instead of constructing instruments to measure the
characteristic of individual differences, as such, instruments constructed to embody or optimize "theories".

According to Stephenson the notion of simple structure is now well known in factor analysis. It is, Thurstone's way of dealing with the gross permissiveness of centroid factors. The structure is usually reached in practice, in relation to correlated factors and only rarely for the original orthogonal ones of the centroid analysis. If the structure of a Q-sample is not known beforehand or if it is an unstructured sample, the factor analysis is conducted with the expectancy that any explanation offered for the data should be representable in the sample at issue, as a balanced block design.

On the basis of the above discussion, as there was no established theory to test innovativeness of administrators, the investigator adopted the simple structured Q-sort procedure.

It would be appropriate to discuss Q-set and the size of the sample i.e. the number of items to be included in Q-set. In respect of the size of the sample in Q-methodology, Wittenbora has commented as follows:
"Goodling and Guthrie (1956) point out that the sample of Q-sort should be selected in much a way as to provide maximum inter-subject variability and minimum inter-subject variability in one aspect of reliability question, and this has been directly attacked by some investigations."

On the same subject, Wittenborn (1961) has cited the study conducted by Hilden (1958) in which correlations for 20 random sets of 50 statements drawn from a universe, of 1,575 statements. They were compared with the correlations for the parent population. In that study, no reliable differences were found. About such a study Wittenborn (1961) has remarked that "from this one might infer that when using items such as these, a sample of 50 statements may be sufficient for Q-sort purposes." (p. 140).

The ranking of a sample of 70-150 items is recommended. The operation consists of having such a sample of items (say statements) from a larger pool constitutes a tool. Because in the Q-technique "significant factors" or "effects" are anticipated, the distribution, though expected to be symmetrical, is not expected to be of normal probability curve. For this reason, the statements are required to be ranked into 10 or more categories. The subject (or operator) is allowed to inspect all the items of each set first, and to form a "general impression" about the statements. Then he puts each card into its "appropriate"
stock or rank according to his own best judgement. The piles obtained thereupon are known as the Q-sort.

Investigators have used Q Sorts in both free and forced-choice styles. On the issue of free vs forced choice Q-Sorts, Wittenborn has cited some studied and finally concluded in the following words:

"The issue of forced vs unforced sorts has been discussed in numerous contexts, and no final agreement seems to have been reached. For example, Jones (1956) points out that there is no one who preferred distribution and Mock (1956) believes, on the basis of his comparisons, that the forced sort method is equal or superior to free sorts. (p. 140).

Lykken (1965) has praised the capacity of the Q-set to "encapsulate the essence" of the subject in the set of more than 100 items. He has argued strongly in favour of the Q-sort items and their validity in general.

4.3.4 Issues in Deciding the Factorial Analysis

The factor analysis in Q-methodology depends upon the factorial design. Stephenson comments on the theory of analysis:
"Factor analysis is concerned with two very different forms of multivariate analysis, one is called interdependency and the other dependency analysis. The former might be called the "blind inductive" approach and the latter the "open-eyed deductive". Interdependency analysis has to do with the discovery of relationships among data, no part of which is regarded as of importance over any other .... The dependent forms of factor analysis proceed very differently, the concerned being with effects which are specified before hand and which one wished merely to put to an empirical test. (p. 28)

He further notes that Q-method involves the joining of two methods of dependency analysis which are to be introduced now. Fisher's methodology is well known, but it is used in a special way, for the structuring of the samples in Q-technique. The structure is used to deal with explanations or the theories at issue. Dependency factor analysis, on the other hand is employed for putting experimental propositions to test. There can be no rules of a routine kind for this. It consists, in practice, in solving centroid factors by rotations, so as to provide answers for propositions which have been asserted before hand or which are "held" theoretically.

Stephenson's achievement has been to represent the theory formally, as structure in the samples used in Q-methodology. The reason for the propositions, in the
profound sense, are embodied in the samples. The structure is a matter for Fisherian balanced designs. In Q-meth­ddology, one has to take care of two kinds of facts and two regions of propositions. The one concerns the variates and factor analysis, the other concerns the samples and variance analysis.

It is to be considered that Fisher's procedures are closely tied to achieveable operations, such as the logic of modern science requires. Fisher's procedures are masters of dependency analysis, that is, the postulation of independent variables and the study of their dependent effects are always at issue.

The essential object in dependency factor analysis is always to achieve simplest structure for all the possible arrangements of any given sets of factors. The most important feature of the simplest structure is the possibility that explanations offered of "pure" factors may or may not offer an explanation of variates involving two or more, or no, factors. Its main effects or factors have true explanatory power, they should provide pertinent explanations for the "mixed" cases.

Some people raise questions about the newness of Q-methodology. They say that the system of correlating persons is nothing new but, dates back to the first decade of this century. Definitely Q-methodology is dependent
upon correlation technique, but it is as new as a freshly built house even if it is built with old bricks. Q-methodology leads in experimental and statistical procedures. One consists of theories, as explanations, in variance designs; Fisher examined the explanations of variance analysis and sample doctrine. Nothing could be neater, in this respect, than the way one represents a theory as a matter for use and not for direct proof for any supposed general implications. A theory is a growing point for experiments, to help the investigator find his way out in reality. So precisely, is a structured Q-sample.

Guilford's (1954) claims that "the (factorial) methods could also be fruitfully used to discover ... dimensions underlying any aspect of personality". (pp. vii-viii).

Stephenson has pointed out that Q-methodology is essentially "postulatory-dependency methodology rather than hypothetic-deductive". The Q-methodology utilizes the Fisher's methodology for variance analysis and structuring of the samples of items, and the centroid method of factor analysis is considered suitable for testing propositions in this technique.

The originator of the technique has pointed out that its use is not merely restricted to test a theory relating to one single individual or operator; according to him:
"This applies no less if we employ a few persons x, y, z .... for the purpose of defining psychological types. Factors for a few persons, like those of a single one, may have considerable invariance attributable to them." For this reason, the present investigator has chosen this technique for exploring whether there are certain common psychological attributes of innovative educational administrators.

4.4 Conclusion

Wittenborn (1961) commenting upon "contributions and current status of Q-methodology" has shown the importance of the new aspect of Q-methodology, particularly the psychometrical and psycho-analytic studies. He points out that this methodological emphasis can contribute to a broad study of personality and numerous related social problems, as the growing acceptance of this methodological emphasis again reminds that psychologists require flexible methods for their researches and will not wait for any orthodoxy.

According to Stephenson, the Q-technique is a modelling device of great beauty, elegance, pregnancy for representing many psychological theories and for putting these to empirical test.
Thus, many authorities have advocated the utility of the Q-technique in personality studies. Therefore, with a view to pursuing ideographic studies and verifying certain postulates relating to innovative educational administrators, the investigator has opted for the Q-methodology.

References


