

Q Methodology – A Journey into the Subjectivity of Human Mind

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ABSTRACT

Aims: This paper introduces a relatively new research methodological tool, known as Q method, useful in exploring issues related to human subjectivity.

Description: Q methodology is unique as it combines the strengths of both qualitative and quantitative research traditions. The sequential steps involve generation of ideas about the research topics, clarification and refinement of the ideas, and rank ordering these ideas by the respondents in a quasirandom distribution. The data are extracted with by-person factor analysis and useful in exploring arrays of attitude either cross-sectionally or longitudinally over a period of time.

Conclusion: Q methodology can be used to analyse opinions, perceptions, and attitudes in both clinical and non-clinical settings. It is a preferred method of human subjectivity study as it provides more in-depth analysis of complex subjectivity issues.

Keywords: Research Methodology, Q method, Human Subjectivity

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INTRODUCTION

Research on subjectivity is yet to gain popularity and acceptance as a valid research tool in health science, particularly among the physicians. Among the obstacles that are most frequently cited are the non-availability of appropriate research tools and difficulties associated with quantification of subjective data. This is evident by the fact that the vast majority of articles published in the peer-review journals are based on objective data only and there are few articles on human subjectivity. With the improvement of health care in recent years, there is increasing awareness among the health care professionals on issues like patient satisfaction, quality of care, doctor-patient relationship, and discharge needs of patients. These are subjective areas that cannot be studied with the conventional quantitative research methodological tools. In this paper a specific

type of research methodology, known as *Q method*, will be introduced and the utilities of this method in health science research will be discussed. This method has the advantage over other subjectivity research tools as it has combined *both* qualitative and quantitative research^(1,2).

This paper is written for general audiences without extensive background in research methodology or in statistics. After reading the paper most of the readers should be able to understand the principle concepts behind the Q methodology. Some of the readers may also develop interest in this method and will be able to identify research issues within their arena that can be investigated with the help of this methodology. Purposefully technical and difficult to understand terms are omitted and concepts are presented in a simplified way. Throughout the paper doctor-patient relationship is used as an example. Readers are urged to portray themselves as a researcher whose responsibility is to find ways to improve the experiences of the patients when they encounter their doctors. You may choose a different context with whom you are more familiar with.

The first section of the paper deals with the historical perspectives of Q methodology and its applications in health science research. Subsequent sections will describe the basic steps of the method itself. Later discussion will concentrate on statistical analysis and available softwares that are suitable for the data analysis in Q methodology. Finally, two separate sections will present the common terms used in Q methodology followed by a brief annotated bibliography.

Q METHODOLOGY:

HISTORICAL PERSPECTIVES

The history of Q methodology is relatively new. It was developed in 1930's by a British physicist-psychologist William Stephenson. The idea behind the development of this methodology was to inquire into the *subjectivity of human mind*⁽²⁾. The examples of such subjectivity are limitless and include aesthetic judgement, appreciation of art, preferences for music, experiences of family after tragic events, and attitudes towards political groups⁽²⁾.

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These were difficult, if not impossible, areas that could not be measured and reported scientifically by the conventional quantitative methods available at that time. Q methodology emerged as a direct result of that deficiency. In the 1970s and 1980s sophisticated computer programs were developed to perform statistical analysis of data derived by the Q methods and thus facilitated the conversion of the subjective data into quantitative form. Over the years, over 4000 articles appeared in scientific journals on the Q method. Most of these are on social studies research that utilised this method while others are related to the various aspects of the method itself. Unfortunately, the number of articles in health science area are few but encouragingly the number is growing steadily. For example, Q methodology has been used successfully to study the doctor-patient relationship, to identify people at risk of depression, and to evaluate patients with chronic pain⁽³⁾. Q methodology has been used in medical education as well. Some of these applications include evaluation of students' interviewing techniques during clinical examinations, medical students' perceptions about their education, and evaluation of educational programs⁽⁴⁾.

DESCRIPTION OF THE METHODOLOGY

The value of Q methodology lies in the fact that it generates and categorises a range of ideas about a specific topic under investigation. The principle is to generate ideas, not to restrict these. It is the researcher's responsibility to create an unrestricted environment where ideas are born and can grow without artificial restraints. Thus it is not necessary to have a defined theoretical framework at the beginning as this may limit the utilities of the research by limiting ideas and introducing researcher's viewpoint into the topics of interest⁽⁵⁾.

At this point we need to expand on the idea of subjectivity as it applied to Q methodology. The literal meaning of subjectivity is *individual point of view*⁽²⁾. Q methodology is based on two premises on subjectivity. First, one's subjectivity is communicable to others. For example, when asked with appropriate question, a patient should be able to express or communicate to others what he/she likes about a specific encounter with the doctor. The second premise is that the subjectivity always advances from the *point of self reference*⁽²⁾. In simpler terms, what is important in Q methodology is the individual patient's feeling or opinion as opposed to others' opinion. These concepts of individual orientation are the essence of Q methodology and are presented in Table I along with other distinctive characteristics.

There are three simple basic steps in Q methodology

Table I: Distinctive Characteristics of Q Methodology.

RESEARCH HYPOTHESIS

Research hypothesis as it applies to quantitative research is not necessary in Q methodology. A hypothesis reflects the viewpoint of the researcher and what he/she expects to prove or disprove by the particular research. As Q methodology is based on an individual respondent's viewpoint and not the researcher's viewpoint, each of the responses is taken as valid and as a valuable source of information in the research.

POPULATION AND SAMPLE

The population, in the conventional research methodological term, refers to the group of people in which the results of the study can be applied. The sample refers to those people on which the study is actually been conducted. In Q methodology, the population and the sample is not as rigidly defined as in quantitative research. The sample needs not to be randomly drawn from the population. Often times, the persons are chosen for the research because they have special relevance to the topic or hold strong views about the topics of interest. Also the sample size is relatively small and it is not unusual to have one case study in detail. The focus is on in-depth analysis of small number of cases rather than superficial analysis of large number of cases.

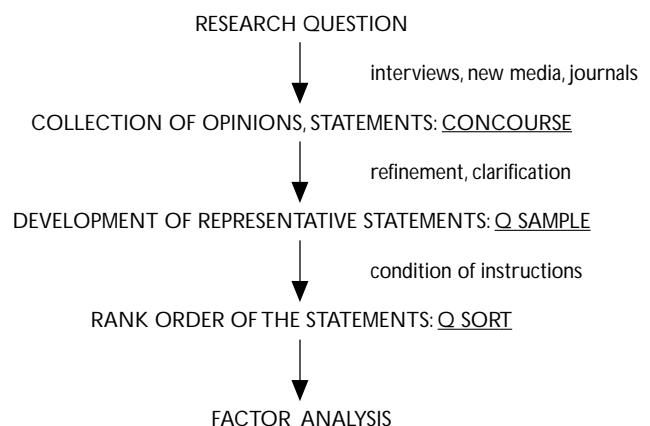
GENERALISATION

Generalisation refers to applicability of research findings beyond the study participants. The generalisation of research data derived from Q methodology is somewhat limited and actually not intended as well. Most of Q methodology is exploratory in nature and tends not to be based on random sample design. The aim is to uncover valid and authentic opinions, in-depth analysis, and subsequent categorisations. Once certain clusters of opinions are identified, their prevalence and distribution can be determined in a population by conducting large surveys.

RELIABILITY

The reliability of Q methodology has been established by various means. One of these is the test-retest study. Studies have shown that when the same instrument is applied to an individual at two points of time, the resultant correlation coefficient is .80 or higher⁽⁶⁾. Interestingly enough, same high level of coefficients are also noted using different sets of statements for the same topic or using different population samples.

Fig. 1 Steps in Q methodology.



(Fig. 1). In the first step, the researcher aims to collect a wide range of ideas about the topic from a variety of sources. This collection is technically known as *concourse*. In the next stage the researcher redefines, clarifies, and combines this raw set of ideas into more meaningful statements. The collection of refined ideas

Table II: Representative Statements from Doctor-Patient Relationship Q Sample.

24. He explained everything to me.
12. He was not professionally dressed.
18. I did not like my doctor he did not prepare me for what is coming next.
 3. Keep asking me questions that I have already answered.
27. I think that the person has a lot of experience with the patients.
13. Interrupted me frequently in the mid-sentence.
 1. I was treated like an intelligent person.
10. Appeared uneasy working with me.
 6. Appeared to be self-conscious in my presence.
22. Behaved appropriately in professional manner.
 9. At the end I left feeling I clearly knew what to expect next.
29. Allowed me to ask question.
16. Looked directly at me.
20. Given a choice I would return to this person for a subsequent problem.
28. I felt my responses to questions were being heard and clearly understood.
 5. Appeared to be in control of the situations.
11. Questions are phrased in appropriate language to be understood.

is known as *Q sample*. After appropriate piloting and testing with a small group of people, this Q sample is ready for the actual study. In the actual study, respondents are asked to rank order this set of statements by a structured instruction. The resultant pattern of distribution of the statements is known as *Q sort*. In the following sections, each of these stages will be discussed in greater details.

The literal meaning of *concourse* is assemble or gathering. In the context of Q methodology it is an assembly of opinions. These opinions can be collected from variety of sources that may include interviews, news media, magazines, professional journals, Internet, or by conducting structured sessions such as Nominal Group Process. In the example of doctor-patient relationship, we may start gathering ideas what ideal doctor-patient relationship should be by asking ourselves what we disliked or liked about a specific encounter we had with our own doctor. Such a question will probably generate responses like "I liked my doctor because he explained everything to me", "I liked my doctor because he paid attention to my problem", "I did not like my doctor as he did not prepare me for what is coming next," or "I feel I was treated with respect". Typically the number of such statements will be more than one hundred. This wide range of statements is our *concourse* and the Q sample will be developed from these.

Once we carefully start studying this large number of statements, we may be able to find some repetitions, some statements may be too ambiguous to interpret, and some may not be relevant to our research topic. At this point, we may have to rewrite some statements for clarity, combine similar ideas into one meaningful statement or simply eliminate some because of irrelevancy to the topic of interest. After careful scrutiny, we have to select a number of value free statements

that are representative of all these statements and capture the main essence of doctor-patient relationship. This set of statements consists the initial Q sample. This sample has to be subsequently tested with a small group of patients to verify important issues such as whether these statements really capture all important viewpoints about the doctor-patient relationship, the need for further clarification, and the ease of interpretation by the respondents. Once this piloting stage is over, the Q sample is ready for the study.

The Q sample at this stage consists of a number of statements about the doctor-patient relationship. The number of statements in a Q sample varies and depends on the complexity of the issue. Each of the statements is then assigned a random number. The sample may contain both negative and positive statements but should not contain two polar statements with same opinion. For example, the Q sample should not contain two statements like "I like my doctor because he explained everything to me" and "I did not like him because his explanation regarding medications was inadequate." A sample of these statements on doctor-patient relationship is presented in Table II. This Q sample is developed from the perspectives of the patients but with slight modification can be used with physicians or other health care professionals.

In the next stage, the respondents are asked to rank order these statements. To simplify the process of rank ordering, the respondents start by separating all the statements in two groups. This separation depends on the research question and the nature of statements in the Q sample. In the example of doctor-patient relationship the statements have both positive and negative connotations. The respondent may be instructed to separate the statements into two groups with first group containing the statements that represents "most like my feeling" and the second group containing statements that represents "most unlike my feeling". Let us take another example where the research question is to identify the skills taught to parents with sick neonates upon discharge. The Q sample in this case will contain items such as "how to perform cardio-pulmonary resuscitation (CPR)", "how do you recognise a baby has infection", "how to bathe the baby". Although all these items are important, the relative weightage attached will depend on the parents' perspective and need. In this scenario, parents may be instructed to separate the statements into two groups with one containing items that they consider important and the other containing items that they consider not so important. The two groups do not have to contain equal number of statements.

After separation, the respondents are asked to rank order the statements. There is a specific way of rank

ordering these statements known as *condition of instruction*. Let us use the doctor-patient relationship Q sample and the table in Fig. 2 as an example. From the group of statements containing 'most like my feeling' the respondents will choose two (only two) statements that most represents his/her feeling about the doctor-patient relationship. The respondent will then place these statements in the two cells of the table (Fig. 2) in the extreme right hand side. From the remaining statements in the 'most like my feeling' group, the respondent will again choose three statement that represents his/her feeling most about the doctor patient relationship and will place them in the three cells immediately central to the extreme right hand cells. The respondent will repeat the process, each time choosing statements that represents his/her feeling most about the doctor-patient relationship and placing them immediately central to the cells that he/she just finishes. Once the respondent completes placing all the statements from the 'most like my feeling' group, he/she will repeat the same process with the 'most unlike my feeling' group. This time the respondent will choose statements that represent most unlike his/her feeling about the doctor-patient relationship and place them in the opposite polar region of the table. The respondent will again work from the polar region to the centre. Thus resultant distribution assumes a quasi-normal or near-normal shape with the most agreeable or disagreeable statements are placed in the two extreme polar regions with the neutral statements are placed in the central region. Each respondent's distribution of these statements constitutes one Q sort and the individual Q sort is the unit of data in Q methodology. Analysis of the Q sort is based on the relative importance of one statement over the others. Thus in deciding the respondent's view point about the specific topic, the extreme polar statements weighted most compared to the statements near the centre.

A sample Q sort on doctor-patient relationship is shown in Fig. 2b. This Q sort contains Q sample number 1 and 6 in the "most agree" region whereas statements number 12 and 10 are in the central region. Obviously, this individual respondent values respect for the patient more than the appearance of the caregiver. As we began to analyse several Q sorts, at least one and usually several patterns of responses will begin to emerge. We may be able to find that for some patients, being respected by the doctors is most important; whereas in others the ability of the doctors to listen and to empathise with patients is more important. The pattern of responses are based on statistical similarities and dissimilarities among the respondents and known as *factors*. Factor analysis is ideally done with the help of special computer programs such as PQ Method

(PQ Method. Peter Schmolock, University of Federal Armed Forces Munich, Germany). This analysis can also be done with more commonly used statistical softwares like SPSS (Statistical Program in Social Science, SPSS Inc., 444 N. Michigan Avenue, Chicago IL 60611, USA).

UTILITIES

Q methodology can be used in a variety of ways depending on the interest of the researchers. As one of the major variables in health science research is often the subjective viewpoints of individuals, Q method can be a perfect tool in a variety of settings. With appropriate modifications, the scope of the research can be expanded to answer many difficult issues. For simplicity let us analyse the doctor-patient relationship in greater depth. Data derived from the Q sort can be used to categorise major models of doctor-patient relationship, to determine the physicians' qualities that are important for the patients, and to identify the physicians' attributes that are associated with poor evaluation from patients. A similar Q sample can be developed for physicians to identify what their perceptions are about on ideal doctor-patient relationship. We may very well find out that there is a vast discrepancy between what physicians believe are important for their patients and what

Fig. 2a A sample table used for Q sorting (29 items).The configuration of the table and the number of columns and rows can be varied depending on the complexity of the issues and the strength of the statements in differentiating the factors.

Most UNLIKE my feeling					Most LIKE my feeling			

Fig. 2b A completed Q sort from a single respondent.

Most UNLIKE my feeling					Most LIKE my feeling			
3	14	23	8	17	15	16	21	1
13	19	9	2	27	11	18	25	6
	4	29	12	26	10	7	5	
			24	20	22			
				28				

patients believe are important. The research areas can be further expanded by conducting more in-depth interviews of prototype of patients from each group. Similarly, the Q sample can be applied before and after an intervention to evaluate the effectiveness of such. For example, we can utilise the Q method to evaluate whether attitudes or perceptions of doctors change following implementation of a course on doctor-patient relationship. In actual practice settings, we can explore patient's viewpoint about a specific doctor by asking him/her to sort a sample after his or her encounter with a doctor and subsequently sorting the sample based on his or her perspective of an ideal clinicians. The difference of these two Q sort will help in providing doctors with feedback. Thus, the Q method has the potential to be used in variety of situations depending upon the interest of the researchers.

CONCLUSION

In the concluding section I would like to urge everybody to identify priority research areas within their own context where Q methodology can be an appropriate research tool. As it has been suggested earlier it can be used in both clinical and non-clinical research areas where subjectivity is the key issue. The possibilities are literally infinite and the results have the potential to contribute significantly to our existing knowledge and to improve patient care.

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APPENDIX A: GLOSSARY OF TERMS USED Q METHODOLOGY

Quantitative: Data that can be measured and reported in numeric terms, e.g. blood pressure profiles of people in Singapore city and antibody titres following hepatitis vaccinations.

Qualitative: Data that cannot be measured in conventional way, like person's feeling about weather and emotional stress following death of significant one.

Subjectivity: Individual point of view, e.g. one's liking for rainy season and disliking for hard rock music.

Q Methodology: A research methodology that combines both quantitative and qualitative methods and used mainly to study the subjectivity of human being.

Concourse: The literal meaning is gathering or collection. It is the initial collection of opinions gathered from variety of sources on the topic of interest. Mostly these are in the form of statements but it can be other media such as picture cards or music.

Q sample: The representative collection of items derived from the concourse; fewer in number than the original concourse and are more refined.

Condition of Instruction: The standardised instruction that the respondents use to rank order the Q sample.

Q sort: The Q sample after the rank order by individual respondent; the Q sorts are the data.

Factor: The cluster of respondents whose Q sorts are similar; these individual share common views about the topic of interest.

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The site is maintained by Peter Schmolock, University of Federal Armed Forces Munich, Germany and it is one of the many sites devoted to Q methodology. The PQ method software is available free to download from this site. Also contain links to other internet resources related to Q method.