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Quantitative and Qualitative Approaches

DEPARTMENT OF SOCIOLOGY

QUALITATIVE AND QUANTITATIVE APPROACHES

TO SOCIAL RESEARCH

Christina Hughes

C.L.Hughes@warwick.ac.uk

There has been widespread debate in recent years within many of the social sciences regarding the relative merits of quantitative and qualitative strategies for research. The positions taken by individual researchers vary considerably, from those who see the two strategies as entirely separate and based on alternative views of the world, to those who are happy to mix these strategies within their research projects. For example, Bryman (1988) argued for a 'best of both worlds' approach and suggested that qualitative and quantitative approaches should be combined. Hughes (1997), nevertheless, warns that such technicist solutions underestimate the politics of legitimacy that are associated with choice of methods. In particular, quantitative approaches have been seen as more scientific and 'objective'.

In exploring issues of qualitative and quantitative research, this material builds directly on the epistemological foundations presented in the package 'What is Research?' For example, in exploring the distinctions between qualitative and quantitative forms of research we need to consider the different ontological and epistemological questions we considered when discussing positivism, interpretivism and critical paradigms. Thus, on first consideration, the use of questionnaires as a research technique might be seen as a quantitative strategy, whereas interviews and observations might be thought of as qualitative techniques. Similarly, it is often assumed that quantitative approaches draw on positivist ontologies whereas qualitative approaches are more associated with interpretive and critical paradigms. A further assumption is that some critical approaches to research, such as feminism, only use qualitative approaches (see Graham, 1984; Jayrantine, 1993 to prove this assumption wrong!). And so in practice, of course, it is often more complicated than that! Thus, interviews may be structured and analysed in a quantitative manner, as when numeric data is collected or when non-numeric answers are categorized and coded in numeric form. Similarly, surveys may allow for open-ended responses and lead to the in-depth study of individual cases. In addition, quantitative and qualitative approaches are strongly associated with objectivity (quantitative) and subjectivity (qualitative). These were issues that we considered in terms of the role of the researcher within the research process earlier in the course. Finally, the choice of approach is linked to the research objectives.

The main aim of this package is to introduce you to, and facilitate your understanding of, the key debates concerning qualitative and quantitative approaches. The learning outcomes are:

- To outline the qualitative and quantitative paradigms;
- To illustrate the distinctiveness of each paradigm;
- To illustrate issues of similarity between each paradigms;
- To outline the ways in which qualitative and quantitative methods can be combined;
- To apply this learning to individual research projects.

AN INTRODUCTION TO THE QUALITATIVE AND QUANTITATIVE DIVIDE

Read the quotations below. Draw up a list of the characteristics of qualitative and quantitative research.

As long ago as 1957, Cronbach drew attention to the existence of two quite separate 'disciplines of scientific psychology'. One sort of psychologist attempts to test general principles about human and animal behaviour, and is concerned with documenting average performance; the other sort of psychologist is interested in describing and interpreting individual

differences, in particular with respect to various dimensions of intellectual ability, personality and psychopathology. The first sort of psychologist does experiments, typically on small samples obtained for reasons of convenience. The other sort of psychologist does larger-scale questionnaire surveys or interview studies, attempts to procure representative samples, and tends to use standard, pre-validated measures. When analysing results, the first sort of psychologist tends to compute t-tests and analyses of variance. The second sort tends to use correlation, regression, and factor-analytic techniques. (Everitt and Hay, 1992: 3-4)

Quantitative research consists of those studies in which the data concerned can be analysed in terms of numbers ... Research can also be qualitative, that is, it can describe events, persons and so forth scientifically without the use of numerical data ... Quantitative research is based more directly on its original plans and its results are more readily analysed and interpreted. Qualitative research is more open and responsive to its subject. Both types of research are valid and useful. They are not mutually exclusive. It is possible for a single investigation to use both methods. (Best and Khan, 1989: 89-90)

Qualitative research is harder, more stressful and more time-consuming than other types. If you want to get your MEd dissertation or whatever finished quickly and easily do a straightforward questionnaire study. Qualitative research is only suitable for people who care about it, take it seriously, and are prepared for commitment (Delamont, 1992: viii)

Quantitative research is, as the term suggests, concerned with the collection and analysis of data in numeric form. It tends to emphasize relatively large-scale and representative sets of data, and is often, falsely in our view, presented or perceived as being about the gathering of 'facts'. Qualitative research, on the other hand, is concerned with collecting and analysing information in as many forms, chiefly non-numeric, as possible. It tends to focus on exploring, in as much detail as possible, smaller numbers of instances or examples which are seen as being interesting or illuminating, and aims to achieve 'depth' rather than 'breadth'. (Blaxter, Hughes and Tight, 1996: 61)

Research is a systematic investigation to find answers to a problem. Research in professional social science areas, like research in other subjects, has generally followed the traditional objective scientific method. Since the 1960s, however, a strong move towards a more qualitative, naturalistic and subjective approach has left social science research divided between two competing methods: the scientific empirical tradition, and the naturalistic phenomenological mode. In the scientific method, quantitative research methods are employed in an attempt to establish general laws or principles. Such a scientific approach is often termed **nomothetic** and assumes social reality is objective and external to the individual. The naturalistic approach to research emphasises the importance of the subjective experience of individuals, with a focus on qualitative analysis. Social reality is regarded as a creation of individual consciousness, with meaning and the evaluation of events seen as a personal and subjective construction. Such a focus on the individual case rather than general law-making is termed an **ideographic** approach. (Burns, 2000: 3)

Quantitative research is empirical research where the data are in the form of numbers.

Qualitative research is empirical research where the data are not in the form of numbers. (Punch, 1998: 4)

QUANTITATIVE RESEARCH

KEY CHARACTERISTICS

- **CONTROL:** This is the most important element because it enables the scientist to identify the causes of his or her observations. Experiments are conducted in an attempt to answer certain questions. They represent attempts to identify why something happens, what causes some event, or under what conditions an event does occur. Control is necessary in order to provide unambiguous answers to such questions. To answer questions in education and social science we have to eliminate the simultaneous influence of many variables to isolate the cause of an effect. Controlled inquiry is absolutely essential to this because without it the cause of an effect could not be isolated.

- **OPERATIONAL DEFINITION:** This means that terms must be defined by the steps or operations used to measure them. Such a procedure is necessary to eliminate any confusion in meaning and communication. Consider the statement 'Anxiety causes students to score poorly in

tests'. One might ask, 'What is meant by anxiety?' Stating that *anxiety* refers to being tense or some other such term only adds to the confusion. However, stating that anxiety refers to a score over a criterion level on an anxiety scale enables others to realise what you mean by anxiety. Stating an operational definition forces one to identify the empirical referents, or terms. In this manner, ambiguity is minimised. Again, *introversion* may be defined as a score on a particular personality scale, *hunger* as so many hours since last fed, and *social class* as defined by occupation.

- **REPLICATION:** To be replicable, the data obtained in an experiment must be reliable; that is, the same result must be found if the study is repeated. If observations are not repeatable, our descriptions and explanations are thought to be unreliable.

- **HYPOTHESIS TESTING:** The systematic creation of a hypothesis and subjecting it to an empirical test.

(Adapted from Burns, 2000: 6-7)

QUANTITATIVE APPROACHES

STRENGTHS AND LIMITATIONS

STRENGTHS

- Precision - through quantitative and reliable measurement
- Control - through sampling and design
- Ability to produce causality statements, through the use of controlled experiments
- Statistical techniques allow for sophisticated analyses
- Replicable

LIMITATIONS

- Because of the complexity of human experience it is difficult to rule out or control all the variables;
- Because of human agency people do not all respond in the same ways as inert matter in the physical sciences;
- Its mechanistic ethos tends to exclude notions of freedom, choice and moral responsibility;
- Quantification can become an end in itself.
- It fails to take account of people's unique ability to interpret their experiences, construct their own meanings and act on these.
- It leads to the assumption that facts are true and the same for all people all of the time.
- Quantitative research often produces banal and trivial findings of little consequence due to the restriction on and the controlling of variables.
- It is not totally objective because the researcher is subjectively involved in the very choice of a problem as worthy of investigation and in the interpretation of the results.

Questions to consider

- Why are only testable ideas of worth in science?
- Scientific study is empirical and objective. What is meant by this statement?

(Adapted from Burns, 2000: 9-10)

QUALITATIVE RESEARCH

KEY CHARACTERISTICS

- *Events can be understood adequately only if they are seen in context. Therefore, a qualitative researcher immerses her/himself in the setting.*
- *The contexts of inquiry are not contrived; they are natural. Nothing is predefined or taken for granted.*
- *Qualitative researchers want those who are studied to speak for themselves, to provide their perspectives in words and other actions. Therefore, qualitative research is an interactive process in which the persons studied teach the researcher about their lives.*
- *Qualitative researchers attend to the experience as a whole, not as separate variables. The aim of qualitative research is to understand experience as unified.*
- *Qualitative methods are appropriate to the above statements. There is no one general method.*
- *For many qualitative researchers, the process entails appraisal about what was studied.*

Ely et al add the following from Sherman and Webb (1988) to their definition:

Qualitative implies a direct concern with experience as it is 'lived' or 'felt' or 'undergone' ... Qualitative research, then, has the aim of understanding experience as nearly as possible as its participants feel it or live it.

QUALITATIVE APPROACHES

STRENGTHS AND LIMITATIONS

LIMITATIONS

- The problem of adequate validity or reliability is a major criticism. Because of the subjective nature of qualitative data and its origin in single contexts, it is difficult to apply conventional standards of reliability and validity.
- Contexts, situations, events, conditions and interactions cannot be replicated to any extent nor can generalisations be made to a wider context than the one studied with any confidence.
- The time required for data collection, analysis and interpretation is lengthy.
- Researcher's presence has a profound effect on the subjects of study.
- Issues of anonymity and confidentiality present problems when selecting findings.
- The viewpoints of both researcher and participants have to be identified and elucidated because of issues of bias.

STRENGTHS

- Because of close researcher involvement, the researcher gains an insider's view of the field. This allows the researcher to find issues that are often missed (such as subtleties and complexities) by the scientific, more positivistic enquiries.
- Qualitative descriptions can play the important role of suggesting possible relationships, causes, effects and dynamic processes.

- Because statistics are not used, but rather qualitative research uses a more descriptive, narrative style, this research might be of particular benefit to the practitioner as she or he could turn to qualitative reports in order to examine forms of knowledge that might otherwise be unavailable, thereby gaining new insight.

- Qualitative research adds flesh and blood to social analysis.

Questions to consider

- What is meant by 'deep' when referring to qualitative data?

- How limiting is the problem of non-replication?

(Adapted from Burns, 2000: 13-14)

QUALITATIVE AND QUANTITATIVE APPROACHES TO

SOCIAL RESEARCH

THE SIMILARITIES

- Whilst quantitative research may be mostly used for testing theory it can also be used for exploring an area and generating hypotheses and theory.

- Similarly qualitative research can be used for testing hypotheses and theories even though it is mostly used for theory generation.

- Qualitative data often includes quantification (eg statements such as more than, less than, most as well as specific numbers).

- Quantitative (ie questionnaire) approaches can collect qualitative data through open ended questions.

- The underlying philosophical positions are not necessarily so distinct as the stereotypes suggest.

QUALITATIVE AND QUANTITATIVE APPROACHES TO SOCIAL RESEARCH

THE COMBINED APPROACH

ELEVEN WAYS TO COMBINE QUALITATIVE AND QUANTITATIVE RESEARCH

1. **Logic of triangulation.** *The findings from one type of study can be checked against the findings deriving from the other type. For example the results of a qualitative investigation might be checked against a quantitative study.*

2. **Qualitative research facilitates quantitative research.** *Qualitative research may: help to provide background information on context and subjects; act as a source of hypotheses; aid scale construction.*

3. **Quantitative research facilitates qualitative research.** *Usually this means quantitative research helping with the choice of subjects for a qualitative investigation.*

4. **Quantitative and qualitative research are combined in order to provide a general picture.** *Quantitative research may be employed to plug the gaps in a qualitative study which arise because, for example the researcher cannot be in more than one place at any one time. Or if not all issues are amenable solely to a quantitative or a qualitative investigation.*

5. **Structure and process.** Quantitative research is especially efficient at getting at the structural features of social life while qualitative studies are usually stronger on process aspects.

6. **Researchers' and subjects' perspectives.** Quantitative research is usually driven by the researcher's concerns, whereas qualitative research takes the subject's perspective.

7. **Problem of generality.** The addition of some quantitative evidence may help generalizability.

8. **Qualitative research may facilitate the interpretation of relationships between variables.** Quantitative research readily allows the researcher to establish relationships among variables, but is often weak when it comes to exploring the reasons for those relationships. A qualitative study can be used to explain the factors underlying the broad relationships.

9. **Relationship between macro and micro levels.** Employing both quantitative and qualitative research may provide a means of bridging the macro-micro gulf. Qualitative research can tap large-scale structural features of social life while quantitative research tends to address small-scale behavioural aspects.

10. **Stage in the research process.** Use at different stages of a longitudinal study.

11. **Hybrids.** Use of qualitative research is a quasi-experimental quantitative study.

(Adapted from Punch, 1998: 247)

QUANTITATIVE AND QUALITATIVE APPROACHES:

WHICH TO CHOOSE?

SIX FACTORS TO TAKE INTO ACCOUNT

1. **Research Questions:** What exactly are you trying to find out? Focus on the 'exactly' as this can lead you either into the quantitative or qualitative direction.

2. **Are we interested in making standardized and systematic comparisons or do we really want to study this phenomenon or situation in detail?**

3. **The Literature:** How have other researchers dealt with this topic? To what extent do you wish to align your own research with standard approaches to the topic?

4. **Practical Considerations:** Issues of time, money, availability of samples and data, familiarity with the subject under study, access to situations, gaining co-operation.

5. **Knowledge payoff:** Will we learn more about this topic using quantitative or qualitative approaches? Which approach will produce more useful knowledge? Which will do more good?

6. **Style:** Some people prefer one to the other. This may involve paradigm and philosophical issues or different images about what a good piece of research looks like.

The question 'quantitative or qualitative?' is commonly asked, especially by beginning researchers. Often, they are putting the 'methods cart' before the 'content horse'. The best advice in those cases is to step back from questions of method, and give further consideration to the purposes and research questions, bearing in mind that the way questions are asked influences what needs to be done to answer them. But when that has been done, and the question still remains, the above factors help in making the decision.

Of course, a reasonable decision in any study might be to combine the two approaches.

(Adapted from Punch, 1998: 244-245)

QUALITATIVE AND QUANTITATIVE APPROACHES

Bibliography

- Bernard, H (1994) **Research Methods in Anthropology: Qualitative and Quantitative Approaches**, London, Sage
- Best, J and Khan, J (1989) **Research in Education**, Englewood Cliffs (NJ), Prentice Hall
- Blaxter, L, Hughes, C and Tight, M (1996) **How to Research**, Buckingham, Open University Press
- Bryman, A (1988) **Quantity and Quality in Social Research**, London, Routledge
- Burns, R (2000) **Introduction to Research Methods**, London, Sage
- Cassell, C and Symon, G (Eds) (1994) **Qualitative Methods in Organizational Research: A Practical Guide**, London, Sage
- Creswell, J (1994) **Research Design: Qualitative and Quantitative Approaches**, Thousand Oaks, (Calif), Sage
- Delamont, S (1992) **Fieldwork in Educational Settings: Methods, Pitfalls and Perspectives**, London, Falmer
- Ely, M et al (1991) **Doing Qualitative Research: Circles within Circles**, London, Falmer
- Everitt, B and Hay, D (1992) **Talking about Statistics: A psychologist's Guide to Data Analysis**, London, Edward Arnold
- Finch, J (1986) **Research and Policy: The Uses of Qualitative Methods in Social and Educational Research**, London, Falmer
- Graham, H (1984) Surveying through stories, in C Bell and H Rosen (Eds) **Social Researching: Politics, Problems, Practice**, London, Routledge and Kegan Paul, pp 104-124
- Halfpenny, P (1979) The analysis of qualitative data, **Sociological Review**, 27, pp 799-825
- Hammersley, M (1989) **The Dilemma of Qualitative Method**, London, Routledge
- Henwood, K and Pidgeon, N (1993) Qualitative research and psychology, in M Hammersley (Ed) **Social Research: Philosophy, Politics and Practice**, London, Sage
- Hughes, C (1997) Mystifying through coalescence: The underlying politics of methodological choices, in K Watson, C Modgil and S Modgil (Eds) **Educational Dilemmas: Debate and Diversity, Quality in Education**, London, Cassell, pp 413-420
- Mason, J (1994) Linking qualitative and quantitative data analysis, in A Bryman and R Burgess (Eds) **Analysing Qualitative Data**, London, Routledge, pp 89-110
- Neuman, W (1994) **Social Research Methods: Qualitative and Quantitative Approaches**, Boston, Allyn and Bacon
- Stanley, L (Ed) (1990) **Feminist Praxis**, London, Routledge
- Punch, K (1998) **Introduction to Social Research: Quantitative and Qualitative Approaches**, London, Sage