human beings we are generally not interested in behaviour per se, but what lies 'underneath' it: the human mind in its various attributes (intelligence, mood, attitude, and motivation), group dynamics, societal forces, culture and so on. That 'underneath' constitutes a realm of latent, or hidden, variables, which cannot be observed directly, but only inferred from observable behaviour. How that should be done is never straightforward. Further still, the very existence of those latent constructs is often a matter of heated controversy (think of the Marxist construct of base and superstructure, or the Freudian concept of personality as a dynamic interplay between Id, Ego and Superego).

For example, a study of depression could involve observation, a questionnaire and life history interviews or, at the other extreme, even an investigation of the chemistry of the brain. The necessity for a range of methods leads to debate over which methods are most 'appropriate' (in some circles, which methods are 'better'). This is a debate that looks likely to remain live and contested.

Another answer is that researchers working in the natural sciences appear to simply 'just get on with it' without really questioning their methods or whether what they are seeking is 'the truth' or (more instrumentally) the best theory. This may be because they are dealing with observables and (in most cases) with variables that can be identified and controlled. It may also be due to the fact that scientists as a community seem to spend little time reflecting on the so-called 'scientific method' (although there are numerous books, dating back for decades, on the philosophy and sociology of science). One of the famous scientists of the past, Sir Peter Medawar, once described the scientific method as a 'mixture of guesswork and checkwork' (Medawar, 1979). He also recounted his experiences with fellow scientists who, when asked what the scientific method is, went very coy and cloudy-eyed.

Perhaps the answer is that there is no such thing as 'the scientific method' although there may be many methods that could be deemed to be 'scientific'. In this book, we examine the traditional meaning of 'scientific' and ask whether any twenty-first-century science could possibly live up to those standards in a complex, postmodern world. But if we question these old

hallmarks, by which standards should social research be judged? Again, we offer our own discussion of these questions.

Further Reading

See Baker, M. (1994), 'Media coverage of education'. *British Journal of Educational Studies*, 42(3), 286–97, for an interesting account of the way that the press have handled current issues in education.

Gardner's accounts of multiple intelligences can be found in Gardner, H. (1983) *Frames of Mind: The Theory of Multiple Intelligences*. New York: Basic Books; and Gardner, H. (1993) *Intelligence Reframed: Multiple Intelligences for the 21st Century*. New York: Basic Books. Is Gardner's idea a theory, a model, a metaphor, a useful idea or simply wild speculation about the human brain? For an interesting critique see White, J. (1998) *Do Howard Gardner's Multiple Intelligences Add Up?* London: Institute of Education.

For a 'balanced' account of Cyril Burt's work, see Joynson, R. B. (1989) *The Burt Affair*. New York: Routledge.

Rowbottom, D. P. and Aiston, S. J. (2006) 'The myth of "scientific method" in contemporary educational research'. *Journal of Philosophy of Education*, 40(2), 137–56.

Vignette One

Left-handed women run twice the risk of breast cancer

Headlines of this ilk featured in many of the papers in September 2005. The media reported a study carried out in Utrecht which investigated 12,000 women, born between 1932 and 1941, and claimed to show that left-handed women were over twice (2.41 times to be exact) as likely to develop breast cancer before the menopause as right-handed ones. The relationship held even after other factors connected to breast cancer in past studies (such as body weight, smoking habits, family history and socio-economic status) were taken into account. The authors explained the results by proposing that higher levels of sex hormones (oestrogen) in the womb induce left-handedness and also increase the risk of breast cancer later on in life.

The study was reported in the *British Medical Journal* and in fairness this should be read in full before one can offer a reasonable evaluation of it (we have not done that). But for this vignette, we simply raise a few pertinent questions that might be asked of this study as reported in the media – and indeed, of any similar headline news.

1. How was 'handedness' defined and operationalized? Strange as it may seem, this is not a straightforward matter. Many label as 'left-handed' a person who writes with her left hand? But what if the same people eat with their right hand? Such inconsistencies in hand preferences are very common, indeed they are the norm (Bishop, 1990). It may be more accurate, therefore, to think of handedness as a continuum of preference (from fully consistent right-handedness to fully consistent left-handedness). This consistency can then be measured by self-report (e.g. filling in a questionnaire about hand preference on a number or activities) or by observation. Thus, classifying someone as left- or right-handed depends crucially on how handedness is defined and measured (Bishop, 1990).
2. How credible is the reported finding? A large sample size means that the finding should not be dismissed out of hand: there may be a genuine correlation between the handedness and the risk of breast cancer. Yet large sample size does not, by itself, prove anything: the correlation may be spurious, an artefact of some unrecognized methodological flaw in sample selection or data collection. Replication is the only way to deal with the doubts. No new finding (and especially strange finding!) should be taken as proven until it is demonstrated independently by several research teams.
3. How plausible is the proposed explanation? It appears that the authors proposed a *causal mechanism*, which links pre-natal levels of oestrogen with left-handedness of one hand, and increased risk of breast cancer on the other. Yet this is surely just a hypothesis: pre-natal levels of oestrogen were not measured in the study. To evaluate the plausibility of this hypothesis, we must rely on the *principle of connectivity* (Stanovich, 2000). A hypothetical causal explanation is plausible only insofar as it is consistent with the existing body of knowledge (in this case, our knowledge about the action of oestrogen on a foetus) that comes from prior research.
3. How *high* is the reported risk? A greater than two-fold increase in the incidence of breast cancer sounds serious, but its seriousness depends entirely on the *baseline rate* of that condition. If breast cancer affects around 12 in 100 women at some point during their lifetimes (a lifetime risk figure reported for the US: National Cancer Institute, 2007) then a 2.41 increase in risk would mean an additional 17 cases per 100 left-handed women – a substantial increase. But if breast cancer was rarer (one case per 100 women, say), then the same 2.41 times increase would translate into just one or two extra cases per 100 women. It is therefore important to report not just relative increase in risk, but also an absolute increase (the number of extra cases per 100 people) – yet this was not generally done in media reports.
4. What is the *relative importance* of left-handedness as a factor? How does it compare in importance with other factors such as smoking or diet?

We realise that most newspaper coverage of complex issues is inevitably oversimplified and even simplistic, but the purpose of this vignette has been to put forward questions that can be posed for research of this kind, which always seems to attract the headlines.

References

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National Cancer Institute (2007) Cancer starts fact sheets: cancer of the breast. www.cancer.gov, 22 January, 2007.

determined by a range of factors ranging from the researchers' own values and strengths to the economic and political context of the research, including the sordid but ubiquitous questions: 'who is paying for it?' and 'who is publishing it?'

Further Reading

Denzin, N. and Lincoln, Y. S. (eds) (1988) *Collecting and Interpreting Qualitative Materials*. London: Sage.

Robson, C. (1993) *Real World Research: A Resource for Social Scientists and Practitioner-Researchers*. Oxford: Basil Blackwell.

Torgerson, C. (2003) *Systematic Reviews*, London: Continuum.

Websites

http://en.wikipedia.org/wiki/Randomized_controlled_trial

Vignette Two

THE POWER OF PRAYER: COULD IT MAKE THINGS WORSE?

In April 2006, several newspapers reported a major study carried out in the USA to see if prayer really can help people. The study (Benson *et al.*, 2006) lasted a decade and was funded to the tune of 2.4 million US dollars. A total of 1802 patients at six US hospitals – all requiring heart bypass surgery – were involved. The patients were randomly assigned into one of three groups:

- 597 patients were told that they may or may not be prayed for, and they were not prayed for;
- 604 patients were told that they may or may not be prayed for, and they were prayed for;
- 601 were told they would be prayed for, and were prayed for.

Importantly, of all the patients, 65 per cent were reported to believe in the power of prayer.

Three congregations were given the job of praying that the patients would have a successful operation followed by a speedy recovery with no complications. One of the prayer groups was Protestant, the other two Catholic. The groups were given the names of the patients. Prayers started the night before the surgery and continued for 14 days.

The research team monitored patients' progress during 30 days following the surgery, taking note of any post-surgery complications. In the two groups who were uncertain about receiving prayer, complications occurred in 52 per cent of patients who were prayed for and 51 per cent of patients who were not. This difference was not statistically significant. Thus, prayer itself appeared to have no effect whatsoever on recovery from heart surgery. The third group (who were prayed for and knew it) suffered more complications (59 per cent) than the other two – a slight but statistically significant difference. The authors stated that they can offer 'no clear explanations for the observed excess of complications' in patients who were certain they were prayed for – though some of them ventured with some speculations (e.g. the role of 'performance anxiety') when interviewed about the study.

Our aim here is simply to raise several pertinent questions that might be asked of this study, which could be equally applied to other research:

- What conclusions are the researchers here justified in making?
  - Is 14 days long enough for prayer to make a difference? Is 30 days long enough to detect its impact? In general terms, how long should any intervention be used for, and its effects monitored for, in order to give it a 'fair crack of the whip'?
  - Is 'the amount of prayer received' a quantity that can be scientifically controlled? After all, all participants, no matter what group they were assigned to, could pray for themselves and be prayed for by their relatives and friends – and, indeed, by numerous religious communities across the world who pray for *everyone* in need.

- Is the prayer of different individuals (and different religious communities) equally effective?
- More generally, could – and should – an experimental study be used to assess the 'impact' of a phenomenon such as prayer, which (by its very nature) deals with the supernatural? Is it not something beyond the realms of science?

- Is such research ethical?
  - 'God moves in mysterious ways' according to many believers – does this make a study of this kind (or indeed any study designed to test the power of prayer) totally inappropriate, or indeed objectionable in the eyes of some people? Could it be seen as being 'anti-God' i.e. putting God to the test or 'checking up on Him'?
  - Is it ethical to pray for some people but not for others?
- Is such research useful?
  - Would a research study of this kind ever change people's actions? Would it stop people from praying? We doubt it – there are far more effective forces at play in determining how people behave than the results of research studies. Some of our practices and actions may be evidence-based, but beliefs can be far more potent than evidence, whether we like it or not.
  - The resources that we can spend researching the ways to improve recovery from coronary bypass surgery are limited (even in the USA!). Was spending $2.4 million to check whether prayer makes a difference a sensible choice?

References

Benson H., Dusek, J.A., Sherwood, J.B., Lam, P., Bethea, C.F., Carpenter, W., Levitsky, S. (2006) 'Study of the Therapeutic Effects of Intercessory Prayer (STEP) in cardiac bypass patients: a multicenter randomized trial of uncertainty and certainty of receiving intercessory prayer'. *American Heart Journal* 151(4), 934–42.

3 Considering the Quality of Research: Methodology, Theory and Location

Methodology: What's it All About?

Methodology is defined by the Shorter Oxford English Dictionary as the 'science of method' or more historically as 'treatise on method'. Our own interpretation of methodology is: the activity or business of choosing, reflecting upon, evaluating and justifying the methods you use. Indeed, the latter is an essential feature of any research report or thesis – i.e. justifying the decisions that have been made on methods. No one can assess or judge the value of a piece of research without knowing its methodology. Thus, the aim of methodology is:

> to describe and analyse methods, throwing light on their limitations and resources, clarifying their suppositions and consequences, relating their potentialities to the twilight zone at the frontiers of knowledge.
>
> (Kaplan, 1973, p.10.)

Although most of this book discusses methods, it should not be forgotten that methodology, i.e. reflection on those methods, is a vital part of any research project, small or large. Table 3.1 summarizes some of the key aspects of methodology in social research.

A final concern in gaining access is to establish contact with a key informant, i.e. someone who can provide the information required either to maintain a sampling strategy or to allow the development of theoretical sampling.

The important general point is that it would be foolish to pretend that a project could be designed and planned, or sampling established, before access had actually been arranged; hence the portrayal of 'messy decisions' shown earlier (Figure 4.1) and the unrealistic idea that a research project proceeds along a straightforward linear pathway.

In Summary: Metaphors for the Researcher

A researcher has a wide range of roles and responsibilities in conducting social research. The main responsibilities, perhaps, are to conduct the research ethically and reflectively. This involves researchers in pondering upon their role in conducting research. Various metaphors for the researcher can be, and have been, put forward. Researchers might see themselves as: an active participant; an observer from a distance; a market researcher; a 'rambler' through an unknown terrain; a detective; a hunter-gatherer; an experimentalist; a gardener; an undercover police officer; or an investigative journalist.

In carrying out an enquiry, a researcher may play a role which relates to one, or more, of these metaphors. It is worth stressing that the way researchers see themselves may be totally different to the way they are perceived by other people involved in the research (especially when children are involved!). Whatever the researcher's self-perception or image in the eyes of the participants, he or she must be aware of, and be able to reflect upon, the key roles and responsibilities which we have outlined in this chapter.

Further Reading

One of the best introductions to the ideas behind chaos theory is still
Gleick, J. (1988) *Chaos: Making a New Science*. London: Heinemann.
Greenbank, P. (2003) 'The role of values in educational research: the case for reflexivity'. *British Educational Research Journal* 29(6), 791–801.

You can obtain further information on ethical standards of conducting research from relevant bodies such as:

- British Psychological Society (BPS): www.bps.org.uk. Select Practitioners, then Ethics, Rules, Charter, Code of Conduct, then The Society Code of Conduct – Ethical Principles for Conducting Research with Human Participants.
- The Department of Health (DoH): www.dh.gov.uk/Home/fs/en. Select Research and Development and then Research Governance or COREC.
- The Medical Research Council (MRC): www.mrc.ac.uk. Select Ethics & Research Governance.
- The British Educational Research Association: http://www.bera.ac.uk/publications/guides.php.

Vignette Three: Ethical Dilemmas of Social Science Research

In most cases it is fairly straightforward to decide whether an experiment or a research study is ethical or not: for example, if the participants were deceived or were forced into being involved. But in some cases there may be disagreement between two sets of opinions or two groups. One example, is the conflict between those who believe that any tests involving animals are morally wrong, compared with the 'pro-testers', who argue that testing certain products e.g. life-saving drugs, with animals is morally justified if sick people can be saved or the 'human condition' in general is made better as a result of using animals in research. In social research, it can be argued that studies in which it is impossible or undesirable to gain participants' consent, e.g. observing people in public places such as parks, streets or sports matches, can still be ethical.

One classic experiment is described below – could this be defended in any way?

The Case of Stanley Milgram's Obedience Experiment

How much pain will one person inflict upon another, simply to be obedient to someone in authority (in this case, the scientist in the white coat)?

This was the question posed by Stanley Milgram, who decided to conduct an experiment as part of his PhD at Yale University in 1961. The time context was the aftermath of the Holocaust and the trial of Adolf Eichmann for his part in the Nazi war crimes of the Second World War. Were Eichmann and his numerous Nazi collaborators in the Holocaust crimes just following orders and therefore not really 'accomplices'?

In the initial study Milgram (1963) advertised for individuals to help in an experiment on memory and learning, for the sum of $4.50 per hour. They arrived and met the experimenter in a white coat, who told them that they would be participating in a study on the role of punishment in learning – some would be teachers and some learners. They were then tricked into believing a genuine lot was drawn to decide who would be a learner and who a teacher. In reality, all the paid participants became teachers – the 'learners' were in fact all actors.

Next, the 'learner' was taken to a room and strapped to a chair, with an electrode in their arm. The teacher was told of this and put in an adjoining room, sitting next to the white-coated experimenter. The teacher was instructed to read a list of two word pairs and ask the 'learner' to read them back. If correct, the learner moved to the next pair – if incorrect, the teacher used a special machine to give the learner an electric shock, starting at 15 volts.

With each wrong answer the shock was increased by 15 volts. The teacher was told this and that the maximum shock available was 450 volts. So the teacher believed that he or she is administering a shock – in reality, the actor next door was never harmed in any way. The teacher heard an ascending range of prerecorded sounds, rising as high as screams of pain, each time a shock was given. After a number of increases, the actor banged on the wall and pretended to complain.

Many of the 'teachers' objected when they reached 135 volts; at this level they began to ask about the purpose of the experiment. The experimenter asked them to continue, at different levels of assertiveness, the highest being 'you have no choice, you must continue'.

Before the trials, Milgram asked his psychologist peers for their prediction. They all believed that only very few (around 1 per cent) teacher-volunteers, who happened to be sadists, would give the highest, 450 voltage.

In fact, in the first trial, as many as 27 out of 40 'teachers' (67 per cent) gave the highest shock, even though they were very uncomfortable in doing this. Everyone did pause and question what they were doing, but no one flatly refused to stop before the 300 volt level. Males were just as obedient as females, although the women 'teachers' were said to be more nervous.

Subsequently, Milgram carried out several versions of his experiment, later described in a book (Milgram, 1974a; see also Milgram, 1974b). It was also replicated several times by other researchers across the world, with roughly similar results (Blass, 1999).

The findings are no doubt amazing and overturned conventional wisdom that only the most sadistic monsters among us would inflict such cruelty in order to be obedient. It is clear that they gave us a powerful insight into the mechanisms of authority-sanctioned violence, from the Holocaust to Abu-Ghraib prison. Yet it is equally clear that the study poses an ethical conundrum. Today, it would almost certainly not receive approval from a research ethics committee (there were few such committees in Milgram's days). Yet many would argue that it should. How can we decide? And who is to decide?

We list but a few more specific ethical questions that can be asked here:

- It is clear that the participants suffered during the study. Were they actually harmed by the study?

Milgram argued the opposite was, in fact, the case. Following the study, he debriefed his participants about its nature and purpose. When he surveyed them some time later, 92 per cent responded, of which 84 per cent stated that they were 'glad' or 'very glad' to have participated, and 15 per cent were neutral. In at least one case, the participation turned out to be a life-changing experience, contributing to a decision to become a conscientious objector during the Vietnam War (Wikipedia, 2007).

Others, however, argued that Milgram's debriefing was not thorough enough, and many participants failed to grasp the true meaning of the experiment.

Thus, the general question remains: Under what circumstances (if any) can certain distress be justified by uncertain hope of personal insight or development?

- What are the ethical limits of deception? Most would agree that some deceiving of participants is justifiable, providing no methodological alternative exists and a full debriefing is offered following the study. But how far can this deception go?
- Could the importance of the findings outweigh our (moral or emotional) qualms about the conduct? In other words, when, if ever, do the ends justify the means?
- Could studies such as Milgram's be justified according to the principles of utilitarian ethics (Bentham and Mill), i.e. they eventually lead to the greatest happiness of the greatest number?
- Who should have the authority to decide on all this? The researcher? But, naturally, he or she has a vested interest in the project going ahead, and so may not be objective. Ethics committees? But they may be too conservative, as they defend not only ethical principles, but legal interests of the institutions they represent.

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Zimbardo, P. G. (2007) 'The Stanford Prison Experiment. A Simulation Study of the Psychology of Imprisonment Conducted at Stanford University'. Retrieved 29 January, 2007, http://www.prisonexp.org/. This is a detailed account of another social psychology experiment which brings in similar ethical issues.