Qualitative research: Part one – Philosophies

David Nicholls

Background: *Qualitative research has made great strides in recent years and it now makes an important contribution to our understanding of health and illness. But there are still many practitioners, academics and researchers who are totally bemused by its principles and practices.*

Content: *In the first of a series of three articles exploring qualitative research philosophies, methodologies and methods, I attempt to unravel some of its complexities and peculiarities, in the hope that those readers new to qualitative research will study it further and consider using it in the future. This article deals with broad questions of philosophy; most especially the fundamental difference between a quantitative and qualitative worldview.*

Conclusions: *This article explores the difference between a belief in a single objective reality and multiple realities, and relates these to quantitative and qualitative research methods. It also considers the role of theory, focusing on the difference between inductive and deductive reasoning. These concepts are the basis for the second article in the series on qualitative methodologies, to appear in the next issue.*

Key words: ■ deductive reasoning ■ inductive reasoning ■ multiple realities ■ philosophy of research ■ qualitative research ■ single objective reality

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A doctoral student working in my department recently asked me how it was that qualitative researchers 'got away' with using such small sample sizes in their studies. How could they generalize their findings, he asked, from studies that only included five subjects? Surely the findings were only relevant to the five people in the study? What value did qualitative research have if it never tested anything? What could it offer health professionals looking to provide evidence-based practice?

Such opinions are not uncommon among health professionals, particularly those schooled in the more traditional biomedical disciplines, which provide an excellent education in how to apply a reductionist's lens to health care, but a somewhat poorer experience of qualitative philosophies. I have learnt over my years teaching research methodology that the lessons of science are deeply embedded within the dry, well-thumbed pages of Gray's Anatomy, and the regulated discipline of endless biomechanics, kinesiology, pathology and physiology lectures. Health professionals familiar with education of this sort are often reluctant to challenge the views that give them confidence in their practice – even if those views are, at times, rather blinkered. It is an old adage that the things we cling to most fervently are those things with the shakiest foundations; since they are the ones most in need of our support (Schimmel, 2008). Surely though, if we are to practice ethically and call ourselves professionals, we should step back occasionally from our long-held beliefs, and look critically on the principles held most dear.

I have learnt that there is much to be gained in developing a critical eye for our beliefs and valued opinions – particularly those that are most taken for granted (Foucault, 1991). Among the allied health professions (and here I am speaking particularly of occupational therapy, physiotherapy, podiatry, radiography, radiotherapy, and speech and language therapy), we place a great deal of faith in the objectivity and superiority of quantitative research. This is not surprising since quantitative research is the way many of us have established our status as professionals. It elevates us above the lay opinions of the general public, and brings us closer to the medical

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profession. In recent years, however, qualitative research has become increasingly popular within the allied health professions and has challenged the hegemony of positivism (Grbich, 1999; Finlay and Ballinger, 2006; Carpenter and Suto, 2008). This is, in part, because of the fact that as our professional training has brought us into university departments, more and more lecturers have become familiar with philosophy and the social sciences. Slowly, these influences are having an effect on allied health curricula and we are becoming more aware of other ways of understanding health and illness (Thorne and Darbyshire, 2005).

Even without wanting to shift entirely away from a purely quantitative view of health, many people now appreciate that a basic understanding of qualitative research can have a positive effect on our thinking and practice. It offers new ways of understanding the complexity of health care, new tools for collecting and analysing data, and new vocabulary to make arguments about the quality of the care we offer. As a consequence of our enhanced learning, we come to realize that qualitative research is neither a sham science nor a poor substitute for experimentation.

The three articles that make up this series offer an introduction to qualitative research in a way that is both accessible and informative. My hope is that the bemused student, the hardened clinical trialist, and the seasoned educator will all find something of value in my explanation of the fundamental philosophical basis of qualitative research, the methodologies that have emerged, and the ways in which data is collected and analysed. In doing this, I will explore the differences between qualitative and quantitative research, the different relationships between researcher and participant, the differences between deductive and inductive reasoning, and some of the challenges of mixed-method research. Even if some of this still leaves you bemused, I am confident that, at the very least, I will have explained how it is that qualitative researchers can get away with only using five people in their studies.

Each of the three articles in the series deals with a different facet of the qualitative research process. The first deals with philosophical questions that distinguish qualitative and quantitative reasoning. The second looks at methodological issues and explores how the philosophical questions define different methodologies. The third looks at sampling, qualitative methods of data collection and analysis, and concludes with some new areas of interest for qualitative researchers. I would suggest that each article is read in series, starting with the philosophy. If tackling philosophy straight from the outset sounds daunting, I would ask you to marshal your courage, because I have assumed nothing in these articles other than your own curiosity, and possibly a little experience as a student of healthcare practice.

Before I launch into the first substantive issue of these articles, there is an issue of style that needs to be clarified. You will have noticed already that I am using first person pronouns (me, I, etc.) instead of the conventional detached voice of the third person (the author, 'it is believed that…'). This is deliberate, and an expression of the convention found in most qualitative research (Wolcott, 2002). The passive voice has been a feature of quantitative research for many years, and it is commonly accepted to be the norm in scientific writing, but few journal editors actually insist on it. It is supposed to convey the objectivity of the author/researcher by displaying his/her detachment from the research process. It can, however, get in the way of clear explanation by producing unwieldy, badly structured sentences, and can create a barrier between the author and the reader at a time when the two should ideally be 'on the same page'. To that end, and for reasons that will become clear later, I will be using first person pronouns as my main stylistic approach in this article. Let me begin then with possibly the most fundamental question that distinguishes qualitative from quantitative reasoning: How do you view reality?

At the heart of the distinction between qualitative and quantitative research lies a question about the nature of reality. For the purposes of brevity, I will leave aside the centuries-long philosophical debate and argue that we can reduce the problem down to two simple questions: Do you believe in a) a single objective reality, or b) multiple realities? I shall explain these two in more detail.

A SINGLE OBJECTIVE REALITY

The belief in a single objective reality has been the 'scientific' way of thinking for more than four centuries (Alderson, 1998; Williams et al, 2000). The belief that objects had their own 'essence' – regardless of what we thought about them, led scientists to want to find these 'essences'; to locate the structural properties of matter; the physical forces that governed nature; the elemental properties of our existence. The idea of a single objective reality is simply that the pen I am holding in my hand exists regardless of me, or you, or anyone else for that matter. Likewise, the cancer that exists in a patient's bowel, or the chronic lung disease that limits a person's physical functioning, exists as a 'real' physical entity, regardless of our lived experience or social conventions.

This simple premise – and one that most people would have no problem with – is the basis of the type of reasoning that underpins quantitative research. This reasoning is often called positivism (from the belief that things – like diseases – have essential, 'positive' properties), and at its heart is the belief that our job as scientists is to locate these positive (i.e. not imagined) properties and explore the natural laws that govern the universe and everything within it. The history of human endeavour since the Enlightenment is testament to a positivist ideal, and it has been the basis of virtually every major scientific discovery and invention since the 17th century.

Positivists try to discover the machinery that makes our world work. Their tools of the trade are experiments, and their goal is objectivity (strictly speaking, the ability to see the essence of the thing they are studying). Studies are conducted under rigorously controlled conditions, and hundreds, sometimes thousands, of individual observations are made to verify that what is being seen is not the result of the researcher's bias or an artefact of testing (Peat et al, 2002).

In health care, positivism is king (Davis and Howden-Chapman, 1996). Randomized controlled trials are the gold standard; the best evidence we have that treatments work; proof – or as close to it as we can get – that treatments have real physiological effects, that one intervention is better than another (or at least better than no intervention at all) (Sackett, 1996; Kaptchuk, 2001). Positivism is the philosophical heart of all clinical trials, experimental and quasi-experimental designs, epidemiological surveys, single-incidence studies, tests of validity and reliability, and a plethora of other quantitative designs. Consider any quantitative study in a published journal and you will see, behind the display of methods and results, the desire to find the driving rules that govern the essence of who we are and how we work.

Unfortunately for us in the allied health sciences, there are some specific reasons why positivism is problematic. Helen Hislop, in her address to the American Physical Therapy Association congress in 1975, recognized one such problem, arguing that 'a great barrier in developing the clinical science of physical therapy is that we treat individual persons, each of whom is made up of situations which are unique and, therefore, appear incompatible with the generalizations demanded by science' (Hislop, 1975: 1076). The same argument could have been made for any of the other allied health professions who are continually challenged by the complexities of contemporary health care. What is more, even the most hardened positivist recognizes that people's lived experience of illness plays a great role in their wellbeing. Writing about chronic breathlessness, for example, Beverley van der Molen wrote that 'dyspnoea is one of the most frightening and distressing symptoms that a patient can experience and, like pain, can only be interpreted and reported by the person experiencing it' (Van der Molen, 1996). Again, the same could be said about many of the problems our patients face and present with. Holloway and Wheeler have argued that, 'the danger of this [quantitative] approach is that researchers treat perceptions of the social world as objective and absolute and neglect everyday social interpretations and the context of the research' (Holloway and Wheeler, 1996: 11). So while qualitative researchers don't deny that there may be a physiological or pathological basis to these problems, they argue that quantitative research does a poor job explaining why two people can seemingly present with the same objective physical signs, and yet clinically present completely differently. Of course, the reason is that quantitative research does not seek to explain these things. But, surely we should ask why it is that those methods that do address these issues appear to play only a marginal role in the knowledge systems, beliefs and curricula of many of the established allied health professions (Finlay and Ballinger, 2006; Carpenter and Suto, 2008)?

My argument is, therefore, that qualitative research addresses a certain set of questions that are particular to allied health care, and that these questions are pivotal to the nature of our thought and practice. What is more, these questions are not well addressed by quantitative research. It is not, therefore, a question of whether qualitative research is necessarily better than a quantitative approach, only which is the right approach for a particular research question. If one asks about the efficacy of an intervention, or the causal nature of a phenomenon, then quantitative research is ideal. But if one wants to explore the meaning of health to individuals or societies, or how health knowledge is constructed, then a qualitative approach would be necessary. In simple terms, the key tenets of quantitative research – objectivity, value-neutrality, detachment, rationalism, and logical reasoning – work well when we exclude people's subjectivity from the equation, but, when a person's experiences, interconnections with others, or social and cultural systems in which they live, breathe, work, love and play demand attention, quantitative research has some profound limitations (see *Case Study 1*).

The rise of resistance to quantitative research

It would be disingenuous to suggest that we are not killed by the cancer cells that invade our bodies and overtake our vital functions, or that people with multiple sclerosis or victims of a myocardial infarc-

tion do not have an underlying pathology. However, implying that these aspects are more important than the personal, social, cultural, economic, embodied, spiritual, or any other phenomena that influence our understanding of health and illness; or that these issues are not equally as worthy of our attention, is somewhat narrow-minded. These are strong words, but in many respects they are not mine. They have been voiced for many years by women, disabled people, indigenous populations, black, gay, lesbian and transgendered people, in fact anyone who has been marginalized by mainstream science; treated as 'other than normal'; made voiceless and subject to the unremitting gaze of orthodox health care. Lincoln and Cannella (2004: 7) argued that experimental quantitative research is ill-suited to the complex and dynamic social world in which we exist, with its 'many forms, sites and variations, especially considering the … subtle social differences produced by gender, race, ethnicity, linguistic status, or class'. They go on to argue that 'multiple kinds of knowledge, produced by multiple epistemologies and methodologies, are not only worth having but also demanded if policy, legislation, and practice are to be sensitive to social needs'.

In truth, the transformation we now see in the acceptance of qualitative research within health care, owes much to the pioneering voices of protest raised in the 1960s and 70s by, among others, feminist researchers, Marxists, black civil rights workers, and disability advocates (Freund et al, 1991; Annadale, 1998; Nettleton, 2006). They argued that healthcare research had become andro-centric (based on stereotypically male values of objectivity, detachment and reason) and euro-centric (built around the Enlightenment logic that developed in the 18th century that dismissed indigenous and vernacular knowledge as unreasoned and primitive). By challenging the dogma of positivism, these pioneers advocated a poly-vocal approach to research. The single objective reality of positivism was replaced by many different voices; some represented the truth (in all its many forms) from the subjective experience of the viewer, others explored the social structures that governed how we acted and thought, others still looked at how we collectively give meaning to things like depression, pain and healing. What was born as a result was an alternative to the idea of a single objective reality. What it put in place was a view that would radically change how we came to think about, and practice, health care (Denzin and Lincoln, 2005).

MULTIPLE REALITIES

The simple premise that every person's experience of health and illness is unique to them is no longer that revolutionary. Even if one accepts the positivistic belief that objects around us are made up of real physical properties that would exist regardless of our ability to perceive them, there are clearly still some things that need to be explained with other ways of thinking. Radiography, for example, is not a thing (like a rock or a chair). It is a concept. There is no essential 'radiographiness' that would exist without human beings. It is abstract – a social construct. You cannot measure 'radiography'. You cannot *see* it, in the true objective sense of the word. Health care is full of such examples. Depression, for instance, may well have a chemical basis to it, but it is a social construct that wasn't even considered an illness until the 20th century (McPherson and Armstrong, 2006). Alcoholism, stress, post-traumatic stress disorder, autism, all these things have their sceptics – people who would doubt the 'reality' of their physical existence. My task here is not to take the side of the nay-sayers however, but rather to highlight that the objectivity of science is not necessarily as clear cut as we would be encouraged to believe. A simple example might serve to make my point.

The French surrealist painter René Magritte once painted a smoker's pipe in the middle of a canvas and called the painting 'This is not a pipe' (Ceci n'est pas une pipe, 1928–9). Like most surrealists, Magritte was making an elegant joke about the unreliability of our sense of perception. This is not a pipe, he argued, but a two-dimensional representation of a pipe, which is not the same thing. While you might argue that this is a flippant way to deal

CASE STUDY 1

Here is a classic phenomenological argument about a woman's experience of cancer to illustrate the difference between a quantitative approach towards a phenomenon, and a qualitative.

Mary is a 35-year-old single mother of two children. She has returned to her GP today to hear the results of some tests.

'Ms Smith,' says the GP, 'I am sorry to tell you that the biopsy results have come back positive. You have a malignant tumour in your breast.'

Now in the time it has taken to say these few words there can have been no noticeable change in the size of the tumour. Its physical dimensions and properties would not have changed that much, but phenomenologically speaking (and we will come back to what this means in the next paper), Mary's life has been turned on its head. How she views her past, her present and future has shifted dramatically. Even the concept of time itself is no longer something that can be measured by a clock. It becomes elastic – warping to allow for what now seems like a dramatically foreshortened future. Anger, frustration, despair, hope, relief, shock, all surface as Mary sits in her chair feeling vulnerable and afraid. She doesn't know it yet, but she is about to enter a system that will label her, stigmatize her, and slot her into a hierarchically-managed system for managing her needs with maximum efficiency and effectiveness. She will come to feel as if her body is at times, literally and metaphorically, not her own, and yet at other times she will become connected with her body in a way that few people could imagine, let alone understand. Sometimes then, measuring illness as a quantitative phenomenon – concerned only with the physical dimensions of a problem – simply fails to grasp its complexity and robs us of our understanding of the humanity at the heart of our experience of health care.

CASE STUDY 2

I have taught students how to read chest X-rays for years. It is always interesting to see how much they learn during the course of their study. In the first year of their degree, I can hold up a chest X-ray and they see the same fluffy lines, black and white patches, and most of them can make out the ribs, shoulders, heart and diaphragm. But they don't see the vacant margin beneath the patient's ribs that tells me they have a pneumothorax. By year three, most of them will recognize collapse and consolidation of the lungs, an enlargement of the left ventricle or an opaque region of the lung apices, and all, without fail, will spot the pneumothorax. Nothing has changed except their ability to interpret the white lines and black blobs differently; to learn the patterns that tell them that the person has left-sided heart failure or is at risk of tamponade. Nothing has changed, and yet everything has changed, because they have learnt to take this two-dimensional representation of lung densities and diagnose a lung disorder. But the chest X-ray does not show them a pneumothorax because the key is that the X-ray is only a representation of these things. And as such it is flawed. Artefacts appear on the film all the time. Errors are made in the reading. Our vision tells us things that we feel we want to see. It is not the truth, only one particular representation of the truth.

with a serious philosophical point, it does serve to undermine our faith in the certainty of our beliefs about what we see, and what we understand from what is in front of our very eyes. Magritte was only reflecting in a painting the uncertainty that had been felt by philosophers from as far back as Descartes in the 16th century, who knew that our eyes deceived us. And yet positivism and objectivity depend on our ability to, literally, see the truth (the parable of doubting Thomas in the bible is in some ways a portrayal of a proto-scientist doubting the superstitions of others in favour of cold, hard facts). Magicians trade on our assured faith in our vision, forcing us to doubt what we have actually seen, and by extension, doubt whether something is even possible. Advertisers know that the pathway to our wallets is through our eyes and that we are willing to believe almost anything if we can see it for ourselves.

We have a belief that our vision is objective even after being shown that this is not the case. This makes the argument for multiple realities difficult, because we want to be reassured that what we perceive to be the truth is, in fact, the truth (Gergen, 2001). And yet, going back to the argument that opened this section, we are also willing to accept that each person is different, and that every person's experience of health and illness is unique to them. This must, therefore, create the possibility of multiple realities. However, the argument for multiple realities does not deny the objectivity of positivism; it merely places it alongside a host of other ways of viewing the world, an equal partner that is useful sometimes, but at others times not. *Case study 2* shows an example of multiple truths in practice.

Of the many paradigms now available to us in health care, the most well-established schools of thought concentrate around four discrete ways of viewing reality: positivism, interpretivism, radical/critical, and postmodern/poststructural (Grant and Giddings, 2002). Having discussed positivism, I will attempt to briefly explain the others.

Interpretivism tries to understand what it is to be human. It is associated with a phenomenological tradition that seeks to understand experience through the eyes of the person experiencing it (Van Manen, 1990). It is the oldest and most well-established of the qualitative traditions, and the one that has gained the most traction in health care, particularly in nursing and occupational therapy. Interpretivists view the objectivity of the world as a subjectively lived phenomenon. Time is lived, the space we occupy is lived, our relationships are lived, our bodies are lived, and are not abstract phenomena amenable to the objective gaze of detached observers (Benner, 1994). The questions 'what does it mean to be human; to be someone with Parkinson's disease; to be alive' are at the heart of the interpretivist's approach to research. Interpretivists come to understand what health and illness mean to people by talking to them, generating texts from interview, and analysing their data phenomenologically (Holloway and Wheeler, 1996). I will discuss this more in the next article.

The radical, or critical, perspective differs from interpretivism in that it seeks not just to understand the world, but also to change it. Radical/critical research has an axe to grind, a case to make, and an argument to voice (Annadale, 1998). Emerging from the twin traditions of feminism and critical social theory, radical/critical research looks to locate and overturn injustice and inequality – be it based on our age, gender, sexual orientation, or physical capabilities (Rose and Glass, 2008). The researchers that advocate for this viewpoint attempt to give a voice to marginalized and oppressed discourses and to empower those who would otherwise be silenced. In many ways, radical/critical researchers have done more than most to expose what they see as the bigotry of modern science, exposing the problematic underbelly of health care (Shilling, 2003). Consider, for instance, the article by Swain et al (2003) titled, 'Practice: are professionals parasites?', or Holmes and Federman's (2003) article 'Killing for the state: the darkest side of American nursing'. Both these articles highlight the problematic nature of health care and argue that it should be otherwise. Both bring to the surface realities of health care that are often challenging and painful. And both, to a greater or lesser extent, champion a cause. Again, I will return to this idea in the next article.

The final paradigm I will explore here is the postmodern/poststructural paradigm. Paradoxically, to even call postmodernism/poststructuralism a paradigm is problematic since they are based on the premise that we should be sceptical of any attempt

to fix on a particular viewpoint (Cheek, 2000). She argues that any attempt to provide a coherent explanation for the way things are in the world should be criticized and undermined. Science, religion, medicine, have all been the target for postmodernists, and the structures that govern the way we think in society (laws, social conventions, habits, etc.) form the basis of poststructural critique (Fox, 1993). Postmodernists/poststructuralists are concerned with language; with the way language gives meaning to things that then subsequently come to be considered real. They are concerned with the discourses that guide our thinking. Biomedicine, for example, is a powerful discourse in contemporary Western society (Williams, 2003). It encourages us to value some things (a view of the body-as-machine, for instance) and dismiss others (like qualitative research or alternative medicine). Therefore, a Western reductionist's view of acupuncture becomes acceptable because it can be explained with conventional understandings of neuroscience, while the traditional Eastern acupuncture tradition is seen as 'fringe', because it relies on a form of reasoning that is alien to us (Eastwood, 2000; Saks, 2001). Importantly, postmodernists/poststructuralists are concerned less with who is speaking the truth about acupuncture here, and more about the structures that make it possible to have the debate in the first place.

What is at stake here then, between the positivists, interpretivists, radical/critical thinkers and the postmodernists/poststructuralists, is the way in which we construct reality. Is it a fixed, objective reality that would exist without human involvement (positivism), or the construction of our personal and social relations with the world (the others)? How do we create meaning about our existence and study the meaning others give to the world around them? Clearly these are important questions if we are to understand what health and illness means to people, how we as health professionals are meant to serve them, and how we are to contribute to the organization of health care in the future. Pivotal in thinking about the reality of our, and others', experience, is our understanding of how we construct meaning; how we generate explanatory theories about the world once we have established a preference for a particular paradigm. This vexed question is what I will turn my attention to next.

THE ROLE OF THEORY

If research 'is the systematic and rigorous process of enquiry which aims to describe phenomena and to develop explanatory concepts and theories' (Bowling, 1997: 1), then it is reasonable to ask how qualitative and quantitative research contribute to the creation and analysis of theory. But when I refer to theory, what do I mean? Is it enough that a theory is a half-formed, one-sided commentary on a person's personal biases? For instance, is my theory that people are alien–reptilian hybrids any less valid than Darwin's theory of evolution? Is string theory any more reasonable as a theory than Newton's explanations for gravity? While we might instinctively argue that the answer is no, we should remember that both of these sets of ideas fulfill the criteria established by logical enlightenment philosophers like David Hume (1711–76) and Immanuel Kant (1724–1804) that theories must provide a classification system for organizing observations; a way of explaining the relationships between phenomena; a way of explaining the way people think and behave; a tool for predicting outcomes; or a way of thinking about a problem. Fulfilling these criteria alone, however, does not mean that these theories are particularly well reasoned. To establish whether a theory stands up to critical scrutiny we must have rigorous methods for producing and testing theory. And this is where qualitative and quantitative research come in. These provide us with a set of logical, reasoned, socially acceptable tools to produce and test theory. They do this by applying two distinct forms of reasoning to an idea. These are called inductive and deductive reasoning.

Inductive reasoning begins with a problem – a germ of an idea – and undertakes a journey of discovery; mapping the local terrain, gathering data, listening, observing, retracing one's steps and, often, taking a different path. The goal of inductive reasoning is to arrive at some theoretical understanding of a problem or a phenomenon as a result of your exploration (Carpenter and Suto, 2008). Inductive reasoning therefore often begins from a small point of departure rather than a fully formed hypothesis, and meaning and understanding are constructed as part of the process of discovery. There is a certain flexibility in the approach which allows for diversions, and the ultimate aim is to generate theory that explains the journey that one has been on. Theories are the product at the end of the process of induction. Therefore, it involves moving from a set of specific concepts to a general conclusion. An example of inductive reasoning can be seen in *Case Study 3*.

You may have already gleaned this from the last paragraph, but inductive reasoning is commonly associated with qualitative research. The critical point about the process refers to the production of theory. Most, although by no means all, inductive reasoning follows a transparent, trustworthy process and results in robust theory that can be applicable with other people, situations and data (*Case Study 3*).

What this case study attempts to show is that inductive reasoning is a process that builds theory. Once

CASE STUDY 3

An example of inductive reasoning might illustrate how it works.

For some years I studied people's experience of chronic breathlessness. I interviewed a small number of people with chronic lung disease over many hours, and then transcribed, coded and categorized my findings. I was on a journey of discovery, not knowing in which direction their experiences would take me. My goal was to better understand how chronic breathlessness affected you as a person, and how one's personality affected the way the breathlessness manifested itself (Nicholls, 2000). During the interviews, it became clear that all of my participants had asked themselves questions, such as 'why me?' 'Why am I the one suffering this way when such-and-such has smoked all his life and he's fit as a fiddle?' 'Why was I the one to suffer accidental lung damage as a child?' 'Why did I smoke for all those years when I knew it was doing me harm?'

Some of the questions they were struggling with seemed in some ways bigger than the physical challenges of everyday life. I reasoned that this was because they knew that their breathlessness would be the death of them, and that they were scared as much about how they might die, as they were of death itself. Chronic breathlessness is qualitatively different in this regard to osteoarthritis, for example, because you will die *from* chronic lung disease, but die *with* osteoarthritis.

All of the participants were grappling with why they had been the ones to suffer. Some were atheists and reconciled themselves by saying that they had done the damage to themselves by smoking, and that was that. Others were devoutly religious and saw their suffering as a chance to show the grace to live a beautiful life even against terrible odds. The participants' reactions to chronic breathlessness were, in essence, the concepts from which it was possible to build a broader theory.

Ultimately, my conversations with these people led me to believe that there was a spiritual dimension to chronic breathlessness that lay at the very heart of how people reconciled themselves to their life, and their death. I was, in research terms, able to build a theory around the role of spirituality in people with chronic breathlessness that I knew I could carry forward to other patients and research participants. Therefore, I was able to apply what I had learnt about the spirituality of breathless people to my other breathless patients, and then in turn to patients with other chronic illnesses.

constructed, the theory (if it is robust and well-reasoned) should have relevance to other populations. Therefore, in this case, my theory about the issue of spirituality was not confined only to the eight people in my study, but to anyone in end-stage lung disease. Moreover, it suggests that spirituality may be a concern for anyone with an acquired illness from which they may die (e.g. chronic renal failure or diabetes). In this way, the theories that are derived from inductive reasoning are theoretically generalizable (or as some refer to it, 'transferable') to others (Holloway and Wheeler, 1996; Abbott and Sapsford, 1998).

I have represented inductive reasoning in the form of an inverted pyramid (*Figure 1*). This shows the relatively discrete point of origin for an inquiry, the multiple pathways that an idea may develop along, the formation of theory, and finally the generalization to other populations.

Deductive reasoning, on the other hand, works differently. Rather than beginning in uncertainty, deductive reasoning beings with a testable hypothesis. From here, the researcher undertakes exhaustive inquiry until the hypothesis has been fully examined. The hypothesis predicts an outcome. Deductive reasoning characteristically uses a vast volume of (often numerical) data, frequently at the outset of the study and data collection is commonly completed before any major data analysis is undertaken. The analysis examines the vital elements of the hypothesis and concludes with a small, highly specific outcome that, on first inspection, is only applicable to a very discrete population (Carpenter and Suto, 2008).

Quite clearly, this is the process that most quantitative studies follow. They seek to explain a particular phenomenon through the analysis of a clearly defined hypothesis. They follow a carefully controlled, experimental method and the results are generalizable to the population not because everyone is alike as much as because they explain the underlying theory that was being tested.

I have represented deductive reasoning as a regular pyramid (*Figure 2*). This shows the origin of the study being in the theory and hypothesis itself, the collection of large amounts of data, the drive towards a discrete focal point for the study, and the generalization of results to other populations.

What these two processes show is that inductive and deductive reasoning share much in common with qualitative and quantitative research

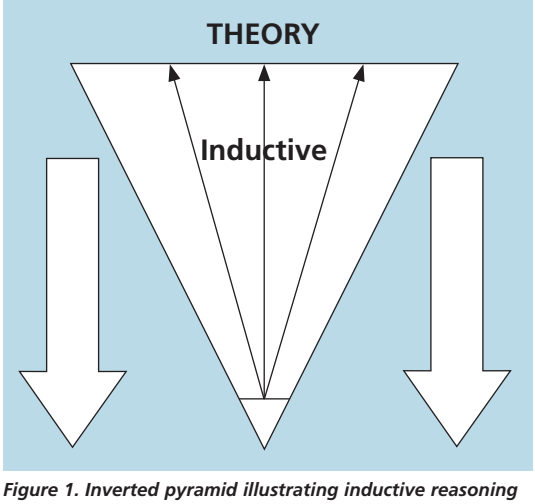

Figure 1. Inverted pyramid illustrating inductive reasoning

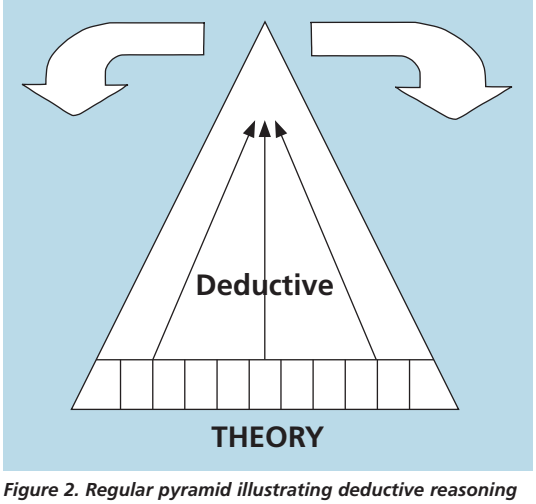

Figure 2. Regular pyramid illustrating deductive reasoning

respectively, and while the distinction is somewhat over-simplified, we can see that, qualitative research is often involved in the inductive process of theory building, and quantitative research is concerned with the deductive process of theory testing. This is represented diagrammatically in *Figure 3*.

CONCLUSIONS

In the first of three articles on the basic principles of qualitative research I have shown that qualitative and quantitative research derive from different philosophical traditions. Quantitative research is grounded in positivism, deductive reasoning and the idea of a single objective reality. In contrast, qualitative research is grounded in a diverse collection of philosophical traditions that have in common their belief in multiple realities. Qualitative research favours inductive reasoning and the construction of theory and meaning of phenomena, and the research is conducted with a variety of philosophical approaches.

In the next article I explore these approaches in more depth and expand on the differences between qualitative and quantitative methodologies. What we will see is that the issue of methodology means different things to the two paradigms, and that in qualitative research the need to identify the philosophical school of thought one is operating under plays a vital role in producing rigorous, meaningful research. IJTR

Conflict of interest: none

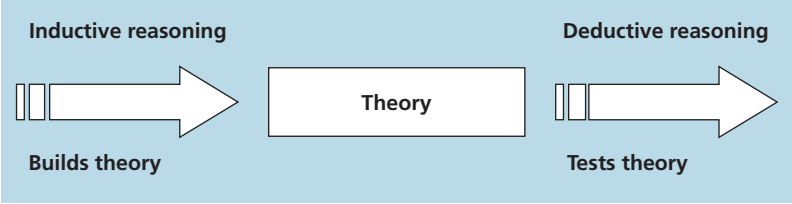

Figure 3. Relationship between inductive and deductive reasoning and theory

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KEY POINTS

- Qualitative research has become increasingly important in healthcare research.
- Quantitative research is traditionally based on a single objective reality.
- Qualitative research derives from a belief in multiple realities.
- The two research traditions emphasize different forms of reasoning that suit their underlying philosophies.