Chapter 3

The cognitive anthropology of belief

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Introduction

Of all disciplines, anthropology has most concerned itself with understanding two sources of constraint on cognition and behaviour: those due to membership of the humans species, and those due to membership of particular societies or social groups. For much of the twentieth century, species constraints were the focus of physical or biological anthropology, while cultural constraints were the focus of social anthropology (Durham, 1991). In recent years, the picture has become more complex, partly due to the advent of new disciplines (for example sociobiology and evolutionary psychology), and partly because of greater interdisciplinary exchanges. In this chapter I will discuss various developments that have come to be termed 'cognitive anthropology', focusing on the accounts they give of the 'power of belief', particularly in relation to beliefs about illness and its treatment. To begin, we will consider a fundamental aspect of beliefs confronting any cross-cultural observer: their extreme diversity.

Medical pluralism and the diversity of beliefs

It is common in all human cultures (including those of the West) for different conceptions of illness and modes of treatment to be pursued simultaneously or at different times in relation to illness. Anthropologists use the term *medical pluralism* to describe this phenomenon (Good, 1995; Kleinman, 1988a, b). In India, for example, a range of models of illness and its treatment are often drawn on serially or in parallel by sick individuals and their close community (Deeley, 1999). In addition to 'allopathic' (biomedical) approaches, other explanations and/or modes of treatment include: the indigenous humoral medicine of Ayurveda; attribution of illness to spirit possession and the enlistment of a *brahmin* priest to perform a healing ceremony or exorcism (*puja*); consultation of possession oracles; homeopathy;

illness as punishment for failure to fulfil a religious vow or duty; and consultation with astrologers (Leslie and Young, 1992). If the list seems extensive, consider that in the UK most of the above are not merely present within communities with links to the Indian subcontinent, but some of them (e.g. Ayurveda, homeopathy) increasingly inform understandings of, and responses to, illness in the wider society. Diverse illness models and treatments have not merely been introduced by migrant communities but are also actively sought out and developed by other groups in society, including the majority white British population. Indeed, the range of approaches in the UK which make some claim to be able to explain, prevent, treat (or cause) various kinds of illness and misfortune is probably impossible to list exhaustively, although examples might include: evangelical Christianity, acupuncture, aromatherapy, macrobiotic diets, TM, scientology, and voodoo (noting that to list them as such is not to imply equivalence between them, but to illustrate their diversity) (Littlewood, 2002; Littlewood and Lipsedge, 1989).

This fact of medical pluralism raises fundamental questions: how do human beings acquire such diverse beliefs about illness and its treatment? And, more broadly, in what ways do species-level constraints interact with cultural and individual constraints on the formation of beliefs? For the purposes of this chapter, we will use Sperber's definition, in which belief is 'a disposition to express, assent to, or otherwise act in accordance with some proposition' (Sperber, 1996, p. 86). Note that this definition encompasses consciously held beliefs as well as presuppositions that might influence cognition below the level of awareness.

Extrapersonal and intrapersonal constraints on cognition and behaviour

A distinction between 'extrapersonal' and 'intrapersonal' constraints on cognition is fundamental to understanding long-standing debates about the relations between culture and cognition, and hence of the relations between culture and belief. Hannerz described the distinction in the following terms:

> . . . culture has two kinds of loci, and the cultural process takes place in their ongoing inter-relations. On the one hand, culture resides in a set of public meaningful forms, which can most often be seen or heard, or are somewhat less frequently known through touch, smell, or taste, if not through some combination of senses. On the other hand, these overt forms are only rendered meaningful because human minds contain the instruments for their interpretation. The cultural flow thus consists of the externalizations of meaning which individuals produce through arrangements of overt forms, and the interpretations which individuals made of such displays – those of others as well as their own
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> (quoted in Strauss and Quinn, 1997, p. 10).

Theoretical approaches in social and cultural anthropology in the twentieth century tended to assert the priority of culture (the extrapersonal realm) in constraining individual behaviour (Durham, 1991). As the British social anthropologist Victor Turner put it, 'social anthropologists of my generation were taught that all human behaviour is the result of social conditioning' (Turner, 1983). Along with this *cultural determinism*, 'cultures' themselves tended to be conceived as strongly individuated (by analogy with different languages), bounded, relatively static, coherent systems of meaning, social roles, relations, artefacts, institutions (depending on theoretical emphasis – see, for example, Ortner, 1984). Strong claims for *cultural relativism* entailed that the scope for intercultural variation was almost indefinite, with few constraints on cognition imposed by intrapersonal factors (for example genes, learning biases, or species-typical cognitive mechanisms) (Hollis and Lukes, 1983). Individual differences tended to be attributed to extrapersonal factors such as differences in social role expectations. Hence, understanding an individual's 'beliefs' (world-view) involved understanding the culture to which they belonged, which could be described using the convention of the 'ethnographic present' – for example, 'the X believe that illness is caused by spirits'.

Anthropologists have subjected strong versions of such 'culturalism' to a number of criticisms, whilst attempting to preserve the insights gained from the discipline's attention to describing and modelling the extrapersonal realm. As Strauss and Quinn put it,

> we have learned how problematic it is, in a world of shifting and multiple identities, to label any set of people as 'the X'. But to a greater extent the problem lies with the phrase 'the culture of the X'. In our discipline's past, such descriptions have too often made it sound as if all the X thought, felt, and acted the same way, had shared this way of life for centuries and would have continued in their traditional ways, unchanged, if colonial education and modern mass media had not intervened. Past descriptions, too, sometimes missed the extent to which the story they told about traditional cultural values and practices was the interested account of one powerful class or faction or a public 'for show' version that hid alternative accounts, challenges to the powerful, or even mundane, widely held practices and understandings that contradicted informants' conscious beliefs about what they were doing
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> (Strauss and Quinn, 1997, p. 3).

The cognitive anthropology of 'belief'

In the wake of such criticisms, some anthropologists have reconceptualized 'culture', and used models derived from cognitive and evolutionary psychology to specify the 'intrapersonal' processes involved in the acquisition of beliefs.

The cognitive anthropologist Sperber distinguishes two kinds of representation. *Mental* (or *internal*) representations exist in the minds and brains of

individuals – examples include beliefs, memories, and intentions. *Public* (or *external*) representations exist in the environment: 'signals, utterances, texts and pictures are all public representations' (Sperber, 1996, p. 24). They acquire or convey meaning when they are interpreted in terms of mental representations.

On this basis, Sperber has proposed an 'epidemiological' approach to culture, in which:

> cultural facts are . . . distributions of causally linked mental and public facts in a human population. More specifically, chains of interaction – of communication in particular – may distribute similar mental representations and similar public productions (such as behaviors and artifacts) throughout a population. Types of mental representations and public productions that are stabilized through such causal chains, are in fact, what we recognize as cultural
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> (Sperber and Hirschfeld, 2001, p. cxxii).

This 'epidemiological' view may seem similar to Dawkin's atomistic theory of 'memes' (items of cultural information constituting a 'meme pool', by analogy with genes in a gene pool) (Dawkins, 1976). Yet Sperber criticizes the meme theory's account of cultural transmission, which extends the analogy with genetics to imply a 'decoding' and 'copying' model of items of cultural information from mind to mind. By contrast, Sperber's version of cognitive anthropology views human communication as based on inferential interpretation of communicative acts rather than the decoding and replication of representations (Sperber and Hirschfeld, 2001).

On this basis, Sperber distinguishes two kinds of 'belief'. *Intuitive beliefs* are 'intuitive in the sense that they are typically the product of spontaneous and unconscious perceptual and inferential processes' (Sperber, 1996, p. 89). Intuitive beliefs are viewed as generated by the rapid, automatic assumptions and inferential processes of evolved mental modules (Sperber, 1996). Humans reason about objects in ways that are distinct for the category of things to which an object belongs; these distinctive forms of reasoning are termed 'naïve theories' (Sperber, 1996). For example 'the spontaneous expectations of not only infants but also adults about the unity, boundaries, and persistence of physical objects may be based on a rather rigid naïve physics' (Sperber and Hirschfeld, 2001). Other domains with their own conceptual mechanisms include theory of mind/naïve psychology (which interprets agentive behaviour in terms of a 'belief-desire psychology'), and folk biology (which partitions and explains living things in terms of biological principles like growth, inheritance, and bodily function) (Sperber and Hirschfeld, 2001).

Reflective beliefs, by contrast, are based on interpretation, the capacity of human minds to re-represent or reflect on concepts. He argues that they do not form a well-defined category, but rather 'come embedded in intuitive

beliefs (or since there can be multiple embeddings, in other reflective beliefs). They cause belief behaviours because, one way or another, the belief in which they are embedded validates them' (Sperber, 1996, p. 89).

Explaining belief in the supernatural

Boyer has applied this approach to explaining religious beliefs, which would include the use of supernatural concepts and related practices to explain and treat illness. The approach can be illustrated by applying it to a case study described by Deeley (1999), the main points of which are summarized below, based on an illness narrative elicited from the brother of an inpatient at the All India Institute of Medical Sciences in New Delhi. He recounted his perspective on the causes and course of illness of his younger sister, who was an inpatient on the psychiatry ward, diagnosed with hysterical aphonia and paralysis. His sister had fallen ill with fever after retaking an English proficiency exam. She attended the local hospital, and various investigations including a lumbar puncture were performed. No cause of her fever was found, and she was discharged home. Shortly afterwards, she became bed-bound, unable to walk or talk, and had to be fed, dressed, and helped to the toilet. The family believed that the lumbar puncture may have caused her problems. After several weeks the family arranged a *puja* (healing ceremony) with a local *Brahmin* priest. During the ceremony, she gesticulated for a pen and paper. She began to write in what appeared to be Urdu, which her Hindi speaking family could not read (and which she herself did not know). They asked her to write in Hindi. She wrote that that she had been taken over by the spirit of a Muslim man (hence Urdu) who (she wrote) had been strangled to death in the village the previous year. This was why she was unable to speak. She stood and prayed like a Muslim man for one hour. The priest said she would be better in one month. The family accepted her attribution of her problems to spirit possession. In the following weeks she regained abilities such as feeding herself, but remained mute. Then her functioning deteriorated, and her family no longer believed she had been possessed because of her failure to recover. She was referred to a national centre, AIIMS in New Delhi, where neurologists diagnosed hysterical aphonia and paralysis, and referred her for inpatient treatment on the psychiatry ward. At the time of interview the brother said that because the treatment with the doctor was ineffective, the family were 'forced to believe in the spirit. He added that now they believed the doctors, though he also repeated that his family believed her problems were caused by the lumbar puncture received at the time of the fever' (Deeley, 1999, p. 113, see original for full version).

What makes the notion of spirit possession sufficiently credible for it to be invoked by the young woman in the context of a healing ceremony, and for family members to accept it (believe it), even if only provisionally?

In Boyer's account of religious belief, supernatural concepts acquire salience by selectively violating domain-based assumptions about the category of things to which they ostensibly belong. Like Sperber, Boyer proposes distinct conceptual domains and inference-mechanisms that interpret the broad categories of objects to be found in the world (PERSONS, ARTEFACTS, ANIMALS, PLANTS). Each category is associated with an 'intuitive ontology', a naïve theory about the properties of the things it contains (exemplified above with reference to Sperber's 'naïve theories').

Given this cognitive background, 'religious concepts are constrained by intuitive ontologies in two different ways: (1) they include explicit *violations* of intuitive expectations, and (2) they tacitly activate a *background* of non-violated "default" expectations' (Boyer, 2000 ibid. p. 101, Boyer, 2002, 2003; Barrett, 2000).

He then proposes the following 'template' for supernatural concepts:

[0] a lexical label

[1] a pointer to a particular ontological category

[2] an explicit representation of a violation of intuitive expectations, either:

  [2a] a *breach* of relevant expectations for the category, or

  [2b] a *transfer* of expectations associated with another category

[3] a link to (non-violated) default expectations for the category

[4] a slot for additional encyclopaedic information (Boyer, 2000, p. 101).

We can apply this to the notion of spirit possession in the narrative described above as follows:

[0] 'spirit' (the English word was chosen by the translators from Hindi)

[1] PERSON

[2] an explicit representation of a violation of intuitive expectations, in this case:

  [2a] it survives death and does not need a body to exist; it can possess the living and cause disabilities or other problems

[3] it exhibits a 'belief-desire' psychology of seeking vengeance, an intelligible motive given that:

[4] it is the spirit of a Muslim man strangled in the village the previous year.

A key implication of this approach is that violation of intuitive expectations for a category is limited: 'a supernatural being with too few unexpected qualities

is not attention demanding and thus not memorable. One with too many unexpected qualities is too information rich to be memorable' (Sperber and Hirschfeld, 2001, p. cxxi). Research on memory for concepts has shown that concepts with a counterintuitive feature (e.g. a dog that passes through solid objects) are more memorable than either fully intuitive concepts (e.g. a brown dog) or bizarre concepts that violate basic, rather than category level, assumptions (e.g. a dog that weighs five tons) (see Barrett, 2000; Boyer, 2000, and for further evidence cited to support the existence of species-typical, early-developed, domain-specific structures of intuitive ontology that underpin religious conceptual templates and memory organization).

'Conceptual salience' and 'belief'

While concepts that minimally violate intuitive expectations may be salient and memorable, this does not necessarily make them *believable*.The characters and events of Greek mythology produce interesting and memorable stories, but few if any now *believe* that the Cyclops really exists. So what, in this view, motivates *belief*, in Sperber's sense of 'a disposition to express, assent to, or otherwise act in accordance with some proposition' (Sperber, 1996, p. 86)?

In *Religion Explained* (Boyer, 2002), Boyer attributes the credibility of supernatural concepts to two kinds of cognitive phenomena – the *aggregate relevance* of concepts, interacting with a suite of minor 'reasoning errors', departures from strict rationality that increase the apparent plausibility of supernatural concepts.

The 'aggregate relevance' of a supernatural belief refers to the way in which a variety of cognitive processes and mechanisms contribute to its plausibility, with no one mechanism likely to be sufficient in its own right. On this view, religious ideas meet the 'entry requirements' for many different kinds of domain-based reasoning, and gain plausibility because of the diverse inferences that they allow. Since gods, ancestors, and spirits belong to the ontological category of PERSONS, they automatically qualify for all of the kinds of reasoning routinely applied to PERSONS in ordinary cognition, with some changes in keeping with the features that violate domain assumptions. Hence, the intuitive-psychology system treats ancestors (or spirits or gods) as intentional agents, the exchange system treats them as exchange partners, the moral system treats them as potential witnesses to moral actions, the Person File system treats them as distinct individuals (paraphrasing Boyer, 2002, p. 361). As Boyer continues, 'this means that quite a lot of mental work is going on, producing specific inferences about the ancestors [or spirits or gods] without ever requiring explicit general statements to the effect that, for example, "there really are invisible ancestors around", "they are dead people",

"they have powers" etc.' (brackets inserted; Boyer, 2002, p. 361). Boyer argues that the inferential relevance of supernatural agents is vastly increased by regarding them as 'perfect access' intentional agents – in other words, knowing what is truly the case – since they can be presumed to take an interest in a far wider range of events than real people could possibly know about (ibid, Boyer, 2002). This inferential relevance, coupled with a universal cognitive tendency to overascribe intentional agency when interpreting events (Guthrie, 1980), explains why the counterintuitive concepts of supernatural beings are more common than non-intentional counterintuitive objects, such as invisible sofas. The latter have much less inferential relevance (Boyer, 2002; Barrett, 2000).

In addition to this 'aggregate relevance', supernatural concepts are accepted because of the commission of common reasoning errors – the list cited by Boyer includes *consensus effects* within the social group; *false consensus effects* (wrongly judging one's own idiosyncratic conception of supernatural concept or to be shared by others); *generation effects* (enhanced memory for self-generated understandings of supernatural concepts); *source monitoring defects* (misattribution to oneself of claims about experiences which apparently confirm the existence and activities of supernatural agents); *confirmation bias* (recollection of instances of apparent confirmation of a supernatural belief, but not of disconfirmations); *cognitive dissonance reduction* (adjustment of expectations in the light of experience which contradicts initial expectations, in order to preserve a belief) (paraphrasing Boyer, 2002 ibid, p. 346 f.).

Critique of the model

Boyer's model entails that the various inference systems constitute a 'standard architecture that we all have by being members of the species' (Boyer, 2000, p. 154). In this view, group level processes provide the superficial, local conceptual content for inference systems, while the species-typical inference systems that process this local content have a rigid, encapsulated design. Their constituent processes can be discovered by cognitive research, but are not accessible to conscious introspection. By analogy with generative grammar, the surface structures of religious belief are local, while the deep structures (the templates and inference systems) are universal. Flexibility in processing is introduced by the selective activation and deactivation of inference systems in accordance with the properties of information presented for processing. Ontological categories function as 'switches' that route conceptual processing through the relevant inference systems (Boyer, 2002, p. 128). Thus, the example cited above of how notions of gods, spirits, and ancestors are

processed entails that by ostensibly belonging to the ontological category of PERSONS, specific subsets of all of the potentially available inference systems (the social exchange system, the person file system, etc.) are activated as necessary to generate relevant inferences. Nevertheless, the inference systems themselves remain encapsulated, unconscious, and shared by all normal members of the species.

Questions confronting Boyer's model will be considered here, in order to indicate alternative ways of understanding the social embeddedness of cognition, including belief. Note that these criticisms are relevant to those versions of evolutionary psychology and cognitive psychology that share the same assumptions about cognition outlined above.

As an initial point, the reasoning errors cited by Boyer as influencing religious belief formation are present in relation to belief in other kinds of concepts and propositions, including those of medicine. All of the reasoning errors could conceivably contribute to the belief of a doctor who was part of a group that advocated, say, megavitamin treatment for flu on the basis of a theory and some anecdotal experience. Indeed, the procedures of evidence-based medicine are designed to limit the effects of such errors and biases. Hence, reasoning errors cannot *differentially* explain beliefs in supernatural concepts as opposed to any other kind of concept even if they contribute in some circumstances.

Relations between concepts and inference systems

More fundamentally, Boyer's model raises the question of what kinds of conceptual systems there are, and how they relate to each other. Inference systems relating to some domains, and the competences they support, do not operate uniformly within all members of the species. For example reading and complex mathematics depend on teaching methods that were invented in specific cultural settings, and were certainly not present in our environment of evolutionary adaptedness. Their respective skills and concepts become internalized through education. Hence, at least for some domains and abilities, group differences do make a difference to the 'deep' structures (conceptual templates and inference systems) as well as the 'surface' structures (conceptual content) of cognition.

Boyer accepts this, but argues that the key inference systems tapped by religious concepts are more universal than those supporting abilities such as local versions of reading and mathematics, and develop without requiring formal instruction or education (Boyer, 2001 p. 211). Even if we accept this position, the existence of group-specific as well as species-typical concepts and

inference systems raises the question of how they are functionally integrated during development and on-line cognition. If Boyer's model demonstrated that universal systems consistently operated independently of group level differences, we might accept that the account of religious concepts is valid. Alternatively, if reasoning about and interpretation of events showed the effects of inferential and associative linkages between locally acquired supernatural concepts and other concepts, then we might conclude that Boyer's model should be substantially qualified. We would have to accept that group differences do make a difference to religious cognition, not just at the 'surface' level of conceptual content, but at the 'deep' level of conceptual structure, inferential relations, motivation, and belief. So an important question is: are there grounds for believing that reasoning about supernatural beings, and belief in supernatural beings, is influenced by locally acquired, superordinate inferential structures that organize the relations between concepts?

Consider, for example, a cross-cultural study that demonstrated that counter-intuitive concepts do indeed seem to be more memorable than control tasks in different populations (Boyer and Ramble, 2001). The study used concepts that were not present in religions familiar to the subjects, but also showed that cultural familiarity with some types of domain-level violations made other types more salient (Boyer and Ramble, 2001). This suggests a local knowledge effect on memory formation, whereby familiarity with a structural type (rather than a specific concept) *decreases* salience. More importantly, though, the study was of memory for unfamiliar concepts, rather than locally familiar concepts that had acquired extensive associative linkages with other concepts and beliefs. It was not, therefore, a study of enculturated beliefs, but rather a study of memory for concepts that had not been incorporated into local knowledge structures. The point here relates to the cognitive difference between concepts that share a structural similarity with religious concepts, and religious concepts that have been internalized through cultural learning. Studies of the former cannot be taken as studies of the latter, if we consider that enculturation itself modifies features of conceptual processing such as motivational salience, inferential relations, and plausibility.

Studies that have been conducted on cognition about divine beings that *are* objects of belief for experimental participants have shown a discrepancy between complex theological views of the properties of the divine beings, and the simpler and more anthropomorphic inferences made about the same divine beings during problem solving and causal reasoning tasks (Barrett and Keil, 1996; Barrett, 2000). This is taken as support for the idea that explicitly held theological ideas about God or gods are distorted and simplified to conform to the expectations of intuitive ontologies (ibid). Again, though, an

adequate model of such constrained religious reasoning must also be able to account for how its outputs (e.g. a specific causal attribution that an illness is due, say, to punishment by God for failure to fulfil a vow) – relate to inferences made on the basis of other conceptual schemata (e.g. that it is due to lumbar puncture, infection, or even 'hysteria'). The questions of how the outputs of such encapsulated processes relate both to explicit reasoning and judgements about the plausibility and motivational salience of specific ideas remain to be answered.

Explaining group differences in beliefs

A related question concerns how cognition about the supernatural is constrained into locally distinctive forms. A species level of explanation may identify constraints on the wide distribution of certain generic kinds of supernatural concepts (gods, ancestors, spirits, for example), but cannot account for how local versions or subsets of such concepts are accepted or rejected. Hence, spirit possession is widely acknowledged as a possible cause of illness in India, but not amongst English Anglicans at the present time, while atheists in India or England are also likely to reject the possibility entirely (see Macdonald (1990) for a period of English history when possession phenomena were more widely accepted). If Boyer's model of universal inference systems as the overriding constraints on religious belief were correct, then one would expect a similar distribution of similar concepts in all populations. Yet this is not the case, as the spirit possession example illustrates. Hence, Boyer's model fails to account for the processes contributing to differences in beliefs between populations, and processes of historical change in beliefs within populations. A theory of these between-group and within-group variations in beliefs would need to account for how the decision rules governing interpretations of events are formed within social groups – for example the locally distinctive way in which the family's interpretation of the young woman's predicament changed. Even if Boyer's model of universal constraints on supernatural concepts is broadly correct, the question of how these mechanisms are incorporated into local knowledge structures, reasoning, and epistemic judgements remains.

Reflective beliefs and intuitive judgements

Accounting for how the plausibility of concepts is determined is a question for all kinds of belief, supernatural or non-supernatural. In the case of non-supernatural conceptions of illness (for example humoral explanations versus biomedical explanations), practitioners in either form of medicine routinely make rapid judgements about the kind of explanation of illness that are

ontologically plausible and epistemologically valid. Hence, most contemporary psychiatrists instantly *know* (or believe they know) that a claim that depression is caused by an excess of black bile is implausible, whereas a claim that depression is caused by deficient serotonin neurotransmission *is* plausible. These kinds of rapid judgements about ontology (what exists) and epistemology (what we know, or can know) are made possible by the extensive internalization of related concepts within specific cultural settings (such as medical schools). Similarly, religions transmit (or fail to transmit) local versions of supernatural concepts, amongst other concepts, values, and behaviours (Bowker, 1987). By considering the effects of cultural systems such as medical schools and religions on cognition, we are reinstating extrapersonal constraints on cognition as a focus of inquiry. Further, non-naïve theories such as those of humoral and biomedicine suggest that Boyer may be overstating the functional distinction between intuitive and reflective beliefs, in so far as what may begin in development as reflective beliefs can function as 'intuitive' beliefs (that is, constrain interpretations of novel events and communication in a rapid, unexamined way). Hence, an account is needed of what allows internalized reflective beliefs to constrain judgements about reality in ways that can (for example) override rival supernatural interpretations that enjoy the benefits of salience and aggregate relevance. Note that the inferential relations between these non-intuitive theories (humoral theories, biomedical theories) and counterintuitive theories (spirit possession) are established within social groups, and certainly cannot be predicted from species membership alone.

Analytic and analogical modes of thought

There are significant culturally acquired inferential links between items belonging to the same and/or different ontological categories. For example astrology posits causal influence between the movements of stars and planets and human affairs, including the psychological, social, and political realms (choosing an auspicious date for a wedding or nuclear arms negotiations), and the physical realm of unsolicited illness or injury (explaining injury due to an accident). Again, these inferential links cannot be predicted from category membership alone, but require attention to local understandings of the world. Indeed, in many societies the formation of analogical or correlative links between different conceptual domains (for example social group, gender, space, time, age, seasons, food, cosmology, agriculture, animals, political power, etc.) is much more elaborate and extensive than is typical of contemporary Western societies. This has given rise to a distinction between two major modes of culturally organized thought – the *analytic* (exemplified in

modern Western scientific thought), and the *analogical* or *correlative* (exemplified in many traditional societies, humoral medical theories, and classical Chinese science, amongst many other examples) (Douglas, 2000). The accounts of these forms of thought developed by historians and social anthropologists can be taken as idealized 'extrapersonal' models. Hence, the question arises of how these extrapersonal conceptual structures are interpreted and internalized by intrapersonal processes (Strauss and Quinn, 1997, and see below).

Taken together, these points suggest that even if species-level explanations identify constraints on conceptual processing, they are insufficient to *differentially* explain enculturated beliefs, religious or otherwise. Rather, a model is needed which can address the questions of how group and individual-specific processes organize concepts into what Quine and Ullian termed 'webs of belief' (see Bell *et al.*, 2003), and invest such related sets of concepts and propositions with a sense of plausibility and reality.

Neoassociationist models of belief

These issues are addressed by an alternative form of cognitive anthropology that has developed in the United States, out of what was formerly known as 'psychological anthropology' (Strauss and Quinn, 1997). Recent work in this tradition has applied schema theory and connectionist accounts of learning to model cultural conditioning (Strauss and Quinn, 1997).

Schemata are 'learned, internalized patterns of thought-feeling that mediate both the interpretation of ongoing experience and the reconstruction of memories' (Strauss, 1997); they comprise 'networks of strongly connected cognitive elements that represent the generic concepts stored in memory' (Strauss and Quinn, 1997, p. 6). Cultural schemata (or cultural models) are those schemata that are widely distributed in a population, such that a '*cultural meaning* is the typical (frequently recurring and widely shared aspects of the) interpretation of some object or event evoked in people as a result of their similar life experiences' (Strauss and Quinn, 1997). On this basis, the generation of cultural beliefs would be analogous to the generation of cultural meanings.

Cultural schemata are acquired by the interaction of intrapersonal learning processes with structured regularities in the extrapersonal environment; as Strauss and Quinn put it, ' "culture" is merely a name for *all* of the learned schemas that are shared by some people, as well as all of the diverse things from which these schemas are learned' (Strauss and Quinn, 1997, p. 38). Cultural schemata 'range from highly concrete and specific constructs for things like spoons and left-turns to high-level schemas for things like love,

success, authority, pollution, and the like' (D'Andrade, 1997, p. 34). Schemas show hierarchical organization, so that high-level schemas (e.g. for love or success) can instigate recruitment of lower level schemas (e.g. for joining a dating service or attending a job fair) (Strauss, 1997, p. 3).

This schema-based approach to cognitive anthropology contrasts with Sperber and Boyer's approach by its use of connectionist models of learning, rather than modularity theory. Instead of evolved conceptual dispositions and inferential biases, connectionist modelling is a form of neoassociationism: knowledge is built up by learning associations (positive or negative correlations) among the features of a number of specific cases, rather than following innate or acquired rules (Strauss and Quinn, 1997, p. 53). The developing schema begins with weights of zero or small connection weights between units in the context of a general-purpose learning algorithm, with connectional strengths modified by environmental inputs; nevertheless, the possibility of species-typical initial weights on networks is acknowledged (Strauss and Quinn, 1997). This unconscious learning is supplemented by explicit instruction and internalized 'cognitive artefacts', such as proverbs, rules of etiquette, and memorized multiplication tables (Strauss and Quinn, 1997). Schema theorists also emphasize the role of emotion in learning, arguing that emotional arousal contributes to associative learning, making some schemas more durable, including those learned early in life (Strauss and Quinn, 1997, p. 89). While schema theory is similar to modularity theory in so far as most information processing is viewed as unconscious and automatic, its emphasis on plasticity of learning gives more scope for relating the processing activities of different schemata through its models of hierarchical and implicational associative linkages between models. As such, it potentially provides a way of modelling how processing of counterintuitive concepts, for example, might be incorporated into superordinate knowledge structures.

Schema theory has been applied to the study of cultural domains such as marriage, romance, parenthood, and employment, rather than illness *per se* (Strauss, 1997; Strauss and Quinn, 1997). Nevertheless, cultural schema theorists have recognized that anthropological descriptions of cultural concepts of illness constitute extrapersonal models that constrain intrapersonal cognition, although they have yet to apply their research methods to study how these extrapersonal models of illness are internalized (Quinn, 1997, p. 211). By contrast, medical anthropologists have conducted extensive field studies using similar kinds of discourse analysis. For example research on illness narratives and explanatory models has elicited local understandings of illness and its treatment (Good, 1995; Kleinman, 1988a, 1988b; Deeley, 1999).

Good's research on local understandings of 'fainting' in Turkey is relevant to the question of how cultural schemata constitute superordinate structures within which specific kinds of conceptual processing – such as reasoning about supernatural causation – occurs (Good, 1995). Good and co-workers found that epilepsy belonged to a larger cultural domain of fainting, and that there were five major narrative types that 'emplotted' fainting episodes in characteristic ways. The commonest plot was of fainting beginning with an emotional trauma such as fright or loss, followed by a quest for cure. A second plot type was of fainting beginning with childhood fever or injury, often linked to a theme of maternal remorse for failing to protect the child. A third type was more medicalized, focusing on sudden unexplained onset, tests, and physiology. A fourth type placed epilepsy in the context of lifetimes of sadness and poverty, linking onset to life tragedies, and was not associated with extensive care seeking. Finally, in some narratives seizure onset was attributed to the evil eye, or to *jinn*, and included visits to religious shrines and healers (Good, 1995, p. 147f).

Narratives would predominantly be of one type, but would often combine features of others. It was typical for multiple interpretations and a 'network of perspectives' about an illness to develop within a family. Good argued that the discursive practices surrounding chronic illness maintain its openness to the possibility of final explanation and cure, and that the narrators of stories about chronic or relapsing illness are always 'in the middle' of the story. Overall, the narratives served to evaluate potential causes of seizures or fainting, establish coherent relationships between a number of significant life experiences, and anticipate the probable course of illness and potential sources of help or cure (Good, 1995, p. 148).

Good's research can be regarded as a delineation of widely distributed schemata that pattern local understandings of the cultural domain of fainting. Note that interpretations of the actions of the evil eye or *jinn* are located within a wider semantic network that constrains the use of those concepts. Hence, this narratological approach can be taken as evidence for the point made against Boyer's model, that processing of supernatural concepts as *beliefs* does not occur independently of locally acquired knowledge structures.

Belief and the sense of the real

Modularity and schema theories both presuppose a capacity for ideas to achieve the cognitive status of 'beliefs' – to be regarded as not merely notional, but *real*. The social processes by which a relatively small subset of possible ideas become tagged as real has been a major focus of the Durkeimian

tradition, which views cultural practices as ways of investing key cultural ideas and values with a heightened sense of reality and authority:

> humans who participate collectively in magico-religious ritual performances do so precisely in order to instil belief in fictional 'other worlds'. Representations of such fictions are more than epiphenomenal; they are central in securing cognitive acknowledgement of and allegiance to the contractual intangibles underpinning cooperation in human social groups
>
> (Dunbar *et al.*, 1999, p. 6).

While the description of religious ideas as 'fictions' is more dismissively reductionist in its tone than most anthropological writing on ritual, the perspective has nevertheless been widespread (Shweder, 1997). Some social anthropologists have turned to neurobiology to identify the intrapersonal mechanisms that may mediate this social evocation of belief. In pioneering work, Victor Turner argued that the sensory components of cultural displays associatively linked strong affect and motivations to their ideological themes (Turner, 1967, 1983). More recently, Whitehouse proposed that different kinds of ritual performance evoke different kinds of memory formation (Whitehouse, 2000). Low frequency, high arousal life-crisis rituals (prominent in smaller scale 'traditional' societies) use intense sensory stimulation to generate heightened emotional states and episodic memory formation; while high-frequency, low arousal religious ceremonies (such as the Catholic mass) typically present doctrinal information, promoting semantic memory formation (Whitehouse, 2000). Nevertheless, regular worship may combine elements of 'high arousal' and 'doctrinal' teachings, such as the incorporation of healing ceremonies, speaking in tongues, and exorcism into Sunday services in evangelical Christianity or Pentecostalism in the UK. These heightened personal or vicarious experiences may be internalized as episodic memories that are recalled, interpreted, and cited as evidence of the doctrinal claims made within the religion.

Recent developments in cognitive neuroscience and neuropsychiatry can illuminate these social processes by which concepts become invested with a sense of reality. Deeley (submitted) has proposed that the neurocognitive systems that 'tag' representations as real should be treated as potentially dissociable from those that invest them with emotional and motivational associations. Nevertheless, the two systems are likely to be closely integrated in development and on-line cognition. These systems – both of which are envisaged as contributing to belief formation – are modulated by two kinds of stimuli that are brought together in cultural displays such as ceremonial rituals. These are: (1) a 'sensory' route that works through the orchestration of reinforcing social-emotional signals and other stimuli (for example chanting, drumming, dancing, masks, bright colours, special foods, etc.); and

(2) a 'semantic' route that involves presentation of perplexing but suggestive verbal and non-verbal symbols that engage a predominantly analogical/right hemispheric processing strategy to make sense of what is authoritatively presented as real but incompletely understood. Both components promote heightened states of emotion and arousal, including activation of the mesolimbic dopamine system, which is viewed as playing a key role in 'tagging' mental representations as *real* (as distinct from merely emotive). Hence, cultural displays such as rituals modulate the activity of this system to promote the epistemic stance of 'belief' towards key representations. In phenomenological terms, participation in arousing cultural displays is experienced as intensely emotional, with loosely associative but salient semantic associations in which pattern-recognition and a sense of reality are heightened. As Knight put it, 'the gods and spirits, normally invisible, must be experienced at least periodically as more real than reality itself' (Knight, 1999, p. 230; see also Kapur, 2003 for the role of mesolimbic dopamine systems, and Brugger, 2001 for the relations between cognitive style and hemispheric predominance).

Medical training and the inculcation of belief

Ceremonial rituals represent one of many kinds of culturally organized techniques for expressing and inculcating key concepts, values, and dispositions. Specialized educational institutions have also been created to transmit beliefs and values, of which medical schools are a prime example. Good and colleagues conducted an ethnographic study of medical education at Harvard medical school, over 4 years in the mid-1980s, to examine the processes by which the distinctive body of concepts, assumptions, values, and competences of doctors are reproduced (Good, 1995).

The research focused on 'practices and experiences common to students . . . , many of which are viewed as so ordinary as to merit little attention' (Good, 1995, p. 66). On this basis, Good argued that 'entry into the world of medicine is accomplished not only by learning the language and knowledge base of medicine, but by learning quite fundamental practices through which medical practitioners engage and formulate reality in a specifically "medical" way. These include specialized ways of "seeing", "writing", and "speaking" ' (Good, 1995, p. 71).

A new kind of 'seeing' is learned in the preclinical years, when much time is spent teaching skills of perceptual discrimination in conjunction with factual knowledge through dissection of the cadaver: 'anatomy required a training of the eyes, to see structure where none was obvious', so that 'veins and arteries, nerves, lymphatic vessels, and connective tissue were largely indistinguishable

from one another until weeks into gross anatomy' (Good, 1995, p. 73). This gross anatomical cognitive–perceptual knowledge is integrated with microscopy of various kinds: 'modern imaging techniques give a powerful sense of authority to biological reality. Look in the microscope, you can see it. Electron microscopy reveals histological concepts as literal' (Good, 1995, p. 74).

Good suggests that 'if mathematical relationships govern astronomy or physics, three-dimensional shapes remain central in biology' (Good, 1995, p. 73), and the different scales at which three-dimensional shapes are learned are organized by a pervasive schema. This schema identifies successive layers of biological reality in a movement from the macroscopic to the microscopic level. For example slide shows in lectures typically followed a format in which a slide about the epidemiology of disease would be followed by successive slides of a patient, a pathological specimen, a low magnification of cell structure, and finally by an electron micrograph.

This schema was evident in the choice of prototypic diseases. For example, 'myaesthenia gravis, a quite rare neurological disorder, has a central place in neurobiology courses, because it is accounted for by a disorder of antibodies to the acetylcholine receptor. Diseases with known, specific mechanisms are taught as prototypes. The message is clear. The architecture of knowledge is in place; we only need to fill in the missing structural links' (Good, 1995, p. 76).

Hence, 'the first two years of medical education provide a powerful interpretation of reality, anchored in the experience of the student. Surface phenomena of signs, symptoms and experience are shown to be understandable with reference to underlying mechanisms at an ontologically prior level. Even broadly incorporative biopsychosocial models, articulated in the language of systems theory, represent biology at the center, social relations outward at the periphery' (Good, 1995, p. 76).

Good's analysis of a distinctive biomedical ontology and epistemology recalls the distinction between 'analytic' and 'correlative' thought described above. Western science relies on analogies as do other kinds of world-view, but the use of analogy in Western science tends to be restricted to specific domains of explanation, and tightly bound to experimental approaches – for example the analogy of billiard balls to work out the kinetic theory of gases (Douglas, 2000). Correlative thinking, by contrast, maps extensive analogical relations and equivalences between different conceptual domains (gender, space, time, food, animals, for example) (Douglas, 2000). What is striking about Good's account of biomedicine, though, is how an 'analytic' discipline (governed by experimental procedures and tightly controlled analogies) allows such extensive ontological correspondences to be posited between different 'levels' of reality. In that respect, the biomedical model resembles a

correlative system of knowledge, although the links between levels are modelled in mechanistic terms. In Good's view, biomedicine has produced a reversal of the hierarchical ordering of the world from material to divine: 'unlike in the Platonic, medieval and renaissance view, . . . ultimacy resides in depth, downward to levels that generate surface phenomena. And such deeper structures are not social or divine but ever more fundamental orders of material reality' (Good, 1995, p. 75). Good comments on the bias this introduces into medical understandings of the complex human phenomena of illness and disease, where attention and resources tend to be invested into researching and manipulating small scale material phenomena such as genes and antibodies, over, say, social or psychological processes.

During clinical training, Good argues that this conceptual structure shapes the distinctive ways in which medical students learn to talk and write about patients. Students learn to formulate a case in terms of evidence for and against a diagnosis; as a student commented, 'of course the real world doesn't lend itself to that, so you distort the real world a little bit to make it fit that nice pattern' (Good, 1995, p. 77). As another student commented, 'they don't want to hear the story of the person. They want to hear the edited version' (Good, 1995, p. 77). Similarly, the skill of writing in notes 'provides a structure of relevance that justifies the systematic discounting of the patient's narrative. It organizes the patient as a document, a project to be worked on' (Good, 1995, p. 78).

Good presents his analysis of medical training not as a critique, but as an attempt to understand an intensive form of socialization, in which a formulation of 'sickness from a materialist and individualizing perspective' is inculcated, in conjunction with an immense body of knowledge and skills (Good, 1995, p. 83). He points out that as the skills are internalized, clinicians have more scope to integrate a more person-focused concern in their practice, at least ideally. He also argues that biomedicine, despite its materialist conception of illness, is also deeply fused with moral conceptions and 'soteriological' issues (that is, referring to suffering and salvation), and at times these dimensions of illness 'erupt as the central issues of medical practice' (Good, 1995, p. 67; see Good, 1995, p. 83 ff for examples such as the emphasis on protecting or prolonging 'life' in the allocation of medical resources and clinical priorities).

Further, it is clear from his account that 'belief' – understood in Sperber's sense as 'a disposition to express, assent to, or otherwise act in accordance with some proposition' (Sperber, 1996), is just one aspect of the substantial reorganization of cognition and skills that occurs during medical training. While he does not discuss his findings in cognitive terms, his analysis

suggests that many cognitive processes are brought into integrated functional relationships to support the distinctive kinds of interpretations, self-representation, and practice that are typical of medicine – these would include functions such as perceptual expertise, attention, planning, semantic and procedural memory, as well as a general demeanour and style involving distinctive social scripts, facial expressions, speech prosody, and pragamatics. Social approval and disapproval from teachers and clinicians, ranging from praise to humiliation, are powerful means of motivating effort and conformity. These emotive experiences are associated with their own episodic memories. Further, strong emotions and changes in self-schemata are also evoked by the way in which social taboos about intimate contact with the dead and the living are collectively broken in a socially sanctioned way; as one female student commented, 'we handle cadavers, have feces lab where we examine our own feces, go to [a mental hospital where we get locked up with] screaming patients. These are total experiences, like an occult thing or a boot camp' (Good, 1995, p. 65). Hence, Good's analysis of medical training reinforces the point that the acquisition of beliefs must be understood in the context of social constraints on other aspects of cognition, experience, and behaviour.

Conclusion

In this chapter I have reviewed contributions of cognitive anthropology to understanding 'the power of belief', supplementing the accounts with reference to social and medical anthropology where appropriate. I have attempted to show that there is considerable scope for dialogue between anthropology and cognitive science, and that group level (cultural) processes contribute to cognition, in addition to species-level and within-group constraints. An ongoing challenge will be to continue to develop ways of integrating the experimental approach of cognitive science with the anthropological tradition of describing and interpreting the complex social and informational environments that human beings inhabit (Sperber and Hirschfeld, 2001). Further, while cognitive neuroscience has made substantial progress through devising methods to isolate and examine discrete functions such as 'selective attention' or 'episodic memory', anthropological accounts of mind and behaviour draw attention to the theoretical challenge of demonstrating how fractionated cognitive processes, including those underlying beliefs, are functionally integrated to support the kinds of locally coherent and meaningful participation in diverse social contexts that is typical of human beings (Deeley, 1999).

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