

# Belief and illness

**D**ESPITE improvements in many objective measures of health over the past decades, most Western countries have seen an increase in the number of patients with symptom-based illness without underlying physical disease (e.g. Aylward, 2006; Salmon, 2006). In the UK some 70 per cent of recipients of incapacity benefit report health-related problems not sufficient to fully explain their incapacity in purely medical terms (Waddell *et al.*, 2002). The resulting gulf between illness presentation, disability and traditional biomedical explanations where relevant pathology cannot be established (Kirmayer *et al.*, 2004) has reinforced the social and cultural basis of illness.

To bridge this gap without abandoning the benefits of the biomedical approach, many healthcare professionals adopt a biopsychosocial perspective (White, 2005). Crucial to this is the belief that illness is not just the result of discrete pathological processes but can be meaningfully explained in terms of psychological and sociocultural factors. In particular, beliefs held by patients about their health and illness are central to the way they present, respond to treatment and evaluate their capacity for work.

However, the beliefs of relevant healthcare professionals, academics and those in wider society are clearly important also when understanding the causes of illness, extent of disability and potential for treatment (Wade & Halligan, 2004). This article considers the nature of belief, and why future developments of the biopsychosocial model need to take account of the beliefs of all the key players involved (Halligan & Aylward, 2006).

## **Beliefs – Our mental scaffolding**

Beliefs are pre-existing notions, different from other sources of knowledge in that they typically involve strong personal endorsement for a proposition considered true and beyond further inquiry. It is not possible to fully appreciate racism, prejudice and political and religious conflict without considering differences in fundamental belief systems.

According to Damasio (2000), the main purpose of belief is to provide meaning about matters that have to do with the ideas we hold of ourselves. Beliefs are powerful precisely because as social constructs they provide the ‘mental scaffolding’ for appraising, explaining and integrating new



**PETER HALLIGAN**, winner of the Society's Presidents' Award, on the importance of societal and individual beliefs in understanding health.

observations – making sense of where we are and collectively underpinning a shared meaning of the world and the role we play in it. One has only to recall the seminal influence of Darwin's theory of evolution, Marx's social, economic and political ideas, Einstein's theory of relativity and Watson and Skinner's focus on a behaviourist psychology to appreciate how emerging beliefs challenge, invigorate and

---

## **‘Beliefs of those taking part and organising clinical trials can confound or prejudice... the results’**

---

influence existing collective interpretations of science and human behaviour.

From a psychological perspective, beliefs remain crucial components of personality and the sense of identity used to define the way others see us. Many of our attitudes (mental dispositions to act), behaviours (established ways of responding to people and situations), including utterances, and ability to cope can be attributed to implicit or explicitly held beliefs (Lazarus & Folkman, 1984). The question remains why some people come to believe certain ideas and not others. There is growing evidence that people have a tendency to believe what they should not. According to Gilbert *et al.* (1993), ‘repeated exposure to assertions for which there is no evidence increases the likelihood that people will believe those assertions’. In addition, ‘several studies have suggested that under some circumstances, people will believe assertions that are explicitly labelled as false’.

## **Medical beliefs through the ages**

A critical feature of belief is the latent capacity to influence behaviour and cognition and govern the way people think and act. According to Dennett (1987), beliefs can be considered as the inner

causes that provide for describing and predicting a person's behaviour (what he calls ‘taking the intentional stance’) – to say that someone believes something is to say that someone is disposed to behave in certain way under certain conditions.

Psychosocial factors such as beliefs are particularly relevant when one considers previous and prevalent notions (biases) harboured within medicine and society regarding the causes of illness, expected recovery and medication efficiency.

For example, it was widely assumed (believed) that medical practice during the 19/20th centuries played a decisive role in halting or reducing the major mortality-based diseases, such as whooping cough, scarlet fever, measles, tuberculosis and typhoid fever. However, as Malleon (2002) points out, most of these conditions ‘had already stopped being major killers before effective medical interventions were introduced for either their cure or their intervention...[and hence] it was social factors and not medical care that transformed [these] health statistics’.

What of other examples from the last two millennia? Well, there is evidence that societal reluctance to entertain the counterintuitive phenomenon of ‘limbless perception’ was in part responsible for the striking absence of historical accounts or interventions for ‘phantom limb pain’ until the late 19th century (Halligan, 2002). And for much of the last 200 years, clinical medicine expressed great pessimism about the potential for ‘plasticity’ (i.e. restoration of damaged brain circuits) in the adult nervous system after acquired brain damage. Many clinicians accepted that the only thing to do was to let nature take its course; consequently intervention focused primarily on pragmatic attempts to ‘compensate’ rather than active rehabilitation (Nadeau, 2002).

The extent to which beliefs ‘colour’ expectations and confound treatment outcome (e.g. selection bias, observer bias, reporting bias and reviewer bias) is also well established in medicine. Schultz *et al.* (1995) found that non-randomised studies

compared with studies that employed adequately concealed treatment allocations, tended to overestimate treatment effects by 41 per cent. Cultural aspects are also implicated. Vickers *et al.* (1998) showed that acupuncture trials conducted in east Asia were always positive, whereas similar trials in Australia/New Zealand, north America or western Europe were only positive half the time.

Awareness that the beliefs of those taking part and organising clinical trials can confound or prejudice the interpretation and significance of results has been a key motivating factor behind several improvements to research design in modern medicine (including the use of double-blind randomised control trials, growth in systematic reviews and more recently, the formal journal policy requiring conflict of interest declarations). More difficult to control, however, has been publication bias. To rectify this, several leading medical journals have agreed only to consider trials for publication that have been registered in a trial registry (Eysenbach, 2004). The hope is that this will help systematic reviewers identify unpublished trials and to reduce post-hoc 'data dredging' (fishing for significance) or selective reporting.

The relationship between (pathological) beliefs and severe mental illness is well accepted, and the significance of beliefs for more general aspects of illness has been highlighted in health psychology (e.g. Ogden, 2004) and many biopsychosocial accounts (e.g. Horne, 1999; Weinman &

Petrie, 1997). This focus on belief as a potential aetiological/modulating influence for illness presentation and explanation requires a better understanding and appreciation of the social cognitive nature of beliefs, including the important role of emotion (Evans & Cruse, 2004).

### Seeing is believing

Fodor (1981) claimed it was important to understand the semantic properties of beliefs, because theories in the cognitive sciences are largely about beliefs. Yet the formal study of beliefs has received comparatively little interest from the cognitive neurosciences (Bell *et al.*, 2006b). There are several reasons for this, not least the nebulous nature of the construct and success in elucidating the functional and neural architecture of more tractable cognitive process (e.g. attention, memory, perception, language and action systems). Moreover, Fodor considered beliefs, as 'central processes', that were qualitatively different from the modular processes traditionally explored by cognitive neuropsychology. Therefore, despite apparent ease of use and acceptance in everyday life, characterising the specific cognitive sub-processes and putative neural systems of belief remain an ongoing research challenge (Bell *et al.*, 2006a).

As with other cognitive processes, we possess little introspective knowledge of the preconscious processing involved in belief formation (Halligan & Oakley, 2000). Moreover, intuitive experience suggests that we do not consciously choose

our beliefs and 'it is likely that the mechanisms that allow us to develop the basis of beliefs, as well as the mechanisms by which we retrieve and express them, are operated in a largely covert manner' (Damasio, 2000).

The idea that much of our phenomenological experience is the product of hidden reconstructive top-down processes is not new and remains a characteristic feature of cognitive psychology (Hassin *et al.*, 2005). Since experience is not simply the registration of 'pure sensory experience' but rather a constructive integration of sensory information filtered through 'predictive brain-based hypotheses', the interpretative filter is important as it provides for the meaning, structure and unity of immediate experience (Gregory, 1998).

Visual illusions provide a useful illustration. Many are the result of built-in bias or predispositions to see the world in a certain way. Even in the case of a stable and enduring illusion like the Müller-Lyer, an uncontrollable consequence of the visual representation requires one to consciously reject the proposition that both horizontal lines are the same length in favour of perceiving an apparent line-length difference.

As such, believing can be seen as analogous to seeing and, given that not all seeing produces an accurate picture of reality, knowing the role beliefs play is important.

Having a belief changes the way evidence is collected and evaluated (Reisberg *et al.*, 2003). The tendency to evaluate incoming evidence in support of current beliefs can have serious consequences. Carlson and Russo (2001) showed that 'predecisional distortion' in potential jurors meant that they were highly susceptible to arriving at unfair verdicts, in the main because of the tendency to view each new piece of evidence with a bias toward the party that the juror already favoured. They maintain that 'people create narratives based on their own experiences to make the facts of a case understandable to themselves'.

Such preconceptions can also influence symptom interpretation by clinicians. In one study (Van Gijn & Bonke, 1977) 20 neurologists were asked to judge films of a number of plantar responses – toe movements in response to an object being scraped along the sole of the foot. The neurologist's interpretation of two

**Beliefs held by patients about their health and illness are central to the way they present, respond to treatment and evaluate their capacity for work**

equivocal toe movements could be biased significantly if a fictitious history and examination results were presented as well; 30 other different neurologists who rated the films without clinical data did not show this bias.

One avenue that has proved productive in understanding beliefs has been the study of delusions or 'pathologies of belief' (Bell *et al.*, 2003). Delusions are clinically significant precisely because, like normal beliefs, they make sense for the believer, are held to be evidentially true, but all too often produce distress and disability.

The recent application of a cognitive neuropsychology approach to psychiatric symptoms (cognitive neuropsychiatry) attempts to better understand the normal psychological functions involved by studying psychopathology and by explaining psychiatric symptoms in terms of normal models of neuropsychological function (Halligan & David, 2001). The last decade has witnessed a welcome growth in research on the cognitive nature of delusions (Bell *et al.*, 2006b). There is now considerable evidence from cognitive neuropsychiatry for the involvement of anomalous perception (Bell *et al.*, 2006a; Ellis & Young, 1990), probabilistic reasoning (Garety *et al.*, 1991) attention, metacognition and attribution biases (Kaney & Bentall, 1989) in delusion formation.

All of this has provided increasingly useful and testable frameworks from which to better understand the cognitive and neural systems involved in delusions (Bell *et al.*, 2006a). Early successes have produced specific and plausible mechanisms for how certain pathological

**Selectively targeted preventive public health initiatives can play a role in successfully changing population beliefs**

beliefs might arise, most notably for the Capgras delusion (Breen *et al.*, 2000; Ellis & Young, 1990). In this account, damage to an unconscious face recognition pathway is impaired, leaving Capgras sufferers without the appropriate emotional response to familiar faces, potentially explaining why they may come to believe that familiar people have been replaced by identical-looking impostors. Although it is unlikely that a unitary belief formation process will be formulated on the basis of the neuropsychological evidence alone, this productive vein of research has already yielded several interesting leads (Bell *et al.*, 2006b).

**Illness beliefs**

What people believe about the nature of their illness and its presentation affects how they and their doctors cope and deal with it (Bates *et al.*, 1997) and remains fundamental for a number of theoretical models of illness behaviour (Wade & Halligan, 2003), causation (Srinivasan & Thara, 2001) and medication compliance (Horne, 2006b). Knowing a patient's beliefs regarding their condition (i.e. their illness representation) is clinically relevant for managing their condition and can also help predict subjective experience, capacity to cope, recovery (Diefenbach &

Leventhal, 1996), treatment compliance and behaviour (Horne, 2006a; Weinman & Petrie, 1997).

A good example of this can be seen in the study by Mittenberg *et al.* (1992), who set out to see whether symptoms of mild brain damage could be related to what patients believed to be the likely symptoms that follow head injury. They asked 223 controls with no personal experience or knowledge of head injury to complete an affective, somatic and memory checklist as to their expectations of symptoms six months post head injury. A similar checklist was given to 100 head-injured patients for comparison. Predicted concussion symptoms in the naive controls reliably showed a coherent cluster of

symptoms virtually identical to the post-concussion syndrome reported by patients with head trauma, suggesting a possible aetiological role for expectations in the experience and expression of symptoms – perhaps people have a reasonable idea of what it would be like to have a head injury, and these beliefs drive some post-injury symptoms. Patients, on the other hand, consistently underestimated the premorbid prevalence of the symptoms compared with controls – people who received a head injury underestimated what life was like before.

In a similar vein but larger-scale, Buchbinder (2006) showed the role that selectively targeted preventive public health initiatives on beliefs can play in successfully changing population beliefs and health-risk behaviours. This study provides compelling empirical findings to support the effectiveness of a groundbreaking mass media campaign in Victoria, Australia, which promoted positive beliefs about back pain and encouraged self- coping strategies among the general public. The campaign not only produced a dramatic reduction in disability from back pain and reliance on healthcare professionals but also changed physicians' beliefs and attitudes towards low back pain and its traditional management.

**DISCUSS AND DEBATE**

What are the range and levels of cognitive processes implicated in the generation and maintenance of beliefs?

Given that beliefs are stored and accessed through dedicated memory systems, are they biologically distinguishable from other form of knowledge and autobiographical memories?

To what extent can clinical 'delusions' inform our understanding of the nature of beliefs?

*Have your say on these or other issues this article raises. E-mail 'Letters' on [psychologist@bps.org.uk](mailto:psychologist@bps.org.uk) or members can contribute via [www.psychforum.org.uk](http://www.psychforum.org.uk).*

The physician's own beliefs can be influenced by patient expectations and other psychosocial factors. In reviewing the Australian epidemic of repetitive strain injury (RSI) in the early 1980s (where New South Wales saw an 11-fold increase in disability claims), Lucire argued that doctors played an important (if unknowing) part in the belief that RSI was the primary result of an occupational injury caused by inhumane working conditions (Lucire, 2003).

As a subjective state of being unwell, illness is culturally defined and socially sanctioned. As such, traditional biomedical models will always struggle to provide satisfactory explanations for the patient or clinician. It is equally important to

recognise that illness beliefs crucially depend on the views of healthcare professionals and society, all of which dynamically contribute to the interpretations of symptoms, patient presentation and treatment outcomes (Cherkin *et al.*, 1995).

Any adequate understanding of illness and associated disability needs to also consider the beliefs held by healthcare professionals, academics and those in wider society regarding the causes of illness, the extent of disability, recovery and the potential for treatment. Central to this account is the 'view that [all] individuals construct models, internal representations or schema which reflect their pooled understanding of previous

experiences and are used for interpreting new ones and planning behaviour' (Weinman & Petrie, 1997).

As social organisations, healthcare systems depend on members of society adopting a congruent belief system (model) regarding the expectations and responsibilities associated with illness and the sick role. Wade and Halligan (2004) suggest that the adoption of a common psychosocial model might improve the delivery of better health more than any other change in healthcare organisation.

■ *Professor Peter Halligan is in the School of Psychology, Cardiff University. E-mail: HalliganPW@cardiff.ac.uk. See also www.cardiff.ac.uk/psych/cpdr.*

## References

- Aylward, M. (2006). Beliefs: Clinical and vocational interventions; tackling psychological and social determinants of illness and disability. In P.W. Halligan, & M. Aylward (Eds.) *The power of belief*. Oxford: Oxford University Press.
- Bates, M.S., Rankin-Hill, L. & Sanchez-Ayendez, M. (1997). The effects of cultural context of health care on treatment and response to chronic pain and illness. *Social Science and Medicine*, 45, 1433–1447.
- Bell, V., Halligan, P.W. & Ellis, H.D. (2003). Beliefs about delusions. *The Psychologist*, 16, 418–423.
- Bell, V., Halligan, P.W. & Ellis, H.D. (2006a). A cognitive neuroscience of belief. In P.W. Halligan, & M. Aylward (Eds.) *The power of belief*. Oxford: Oxford University Press.
- Bell, V., Halligan, P.W. & Ellis, H.D. (2006b). Explaining delusions: A cognitive perspective. *Trends in Cognitive Sciences*, 10, 219–226.
- Breen, N., Caine, C., Coltheart, M., Hendy, J. & Roberts, C. (2000). Towards an understanding of delusions of misidentification. In M. Coltheart & M. Davies (Eds.) *Pathologies of belief*. Oxford: Blackwell.
- Buchbinder, R. (2006). Managing disability by public policy initiatives. In P.W. Halligan, & M. Aylward (Eds.) *The power of belief*. Oxford: Oxford University Press.
- Carlson, J. & Russo, E. (2001). Biased interpretation of evidence by mock jurors. *Journal of Experimental Psychology: Applied* 2001, 7, 91–103.
- Cherkin, D.C., Deyo, R.A., Wheeler, K. & Ciol, M.A. (1995). Physician views about treating low back pain. *Spine*, 20, 1–9.
- Damasio, A.R. (2000). Thinking about belief. In D.L. Schacter & E. Scarry (Eds.) *Memory, brain and belief*. Cambridge, MA: Harvard University Press.
- Dennett, D. (1987). *The intentional stance*. Cambridge, MA: MIT Press.
- Diefenbach, M.A. & Leventhal, H. (1996). The common sense model of illness representation. *Journal of Social Distress and the Homeless*, 5, 11–38.
- Ellis, H.D. & Young, A.W. (1990). Accounting for delusional misidentifications. *British Journal of Psychiatry*, 157, 239–248.
- Evans, D. & Cruse, P. (2004). *Emotion, evolution and rationality*. Oxford: Oxford University Press.
- Eysenbach, G. (2004). Tackling publication bias and selective reporting in health informatics research. *Journal of Medical Internet Research*, 6(3), e35.
- Fodor, J.A. (1981). The mind-body problem. *Scientific American*, 244, 114–123.
- Garety, P.A., Hemsley, D.R. & Wessely, S. (1991). Reasoning in deluded schizophrenic and paranoid patients. *Journal of Nervous and Mental Disease*, 179, 194–201.
- Gilbert, D.T., Tafarodi, R.W. & Malone, P.S. (1993). You can't not believe everything you read. *Journal of Personality and Social Psychology*, 65, 221–233.
- Gregory, R. (1998). Brainy mind. *British Medical Journal*, 317, 1693–1695.
- Halligan, P.W. (2002). Phantom limbs: The body in mind. *Cognitive Neuropsychiatry*, 7, 251–268.
- Halligan, P.W. & Aylward, M. (Eds.) (2006). *The Power of belief: Psychosocial influence on illness, disability and medicine*. Oxford: Oxford University Press.
- Halligan, P.W. & David, A.S. (2001). Cognitive neuropsychiatry: Towards a scientific psychopathology. *Nature Neuroscience Review*, 2, 209–215.
- Halligan, P.W. & Oakley, D. (2000). Greatest myth of all. *New Scientist*, 2265, 34–39.
- Hassin, R.R., Uleman, J.S. & Bargh, J.A. (Eds.) (2005). *The new unconscious*. New York: Oxford University Press.
- Horne, R. (1999). Patients' beliefs about treatment: The hidden determinant of treatment outcome? *Journal of Psychosomatic Research*, 47, 491–495.
- Horne, R. (2006a). Beliefs and adherence to treatment: The challenge for research and clinical practice. In P.W. Halligan, & M. Aylward (Eds.) *The power of belief*. Oxford: Oxford University Press.
- Horne, R. (2006b). Compliance, adherence, and concordance: Implications for asthma treatment. *Chest*, 130(1 Suppl), 65S–72S.
- Kanay, S. & Bentall, R.P. (1989). Persecutory delusions and attributional style. *British Journal of Medical Psychology*, 62, 191–198.
- Kirmayer, L.J., Groleau, D., Looper, K.J. & Dao, M.D. (2004). Explaining medically unexplained symptoms. *Canadian Journal of Psychiatry*, 49, 663–672.
- Lazarus, R.S. & Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer.
- Lucire, Y. (2003). *Constructing RSI: Belief and desire*. University of New South Wales Press.
- Malleau, A. (2002). *Whiplash and other useful illnesses*. Montreal: McGill-Queens University Press.
- Mittenberg, W., DiGiulio, D.V., Perrin, S. & Bass, A.E. (1992). Symptoms following mild head injury: Expectation as aetiology. *Journal of Neurology, Neurosurgery and Psychiatry*, 55, 200–204.
- Nadeau, S.E. (2002). A paradigm shift in neurorehabilitation. *Lancet Neurology*, 1, 126–130.
- Ogden, J. (2004). *Health psychology* (3rd edn). Buckingham: Open University Press.
- Reisberg, D., Pearson, D.G. & Kosslyn, S.M. (2003). Institutions and introspections about imagery. *Applied Cognitive Psychology*, 17, 147–160.
- Salmon, P. (2006). Explaining unexplained symptoms: The role of beliefs in clinical management. In P.W. Halligan & M. Aylward (Eds.) *The power of belief: Psychosocial influence on illness, disability and medicine*. Oxford: Oxford University Press.
- Schultz, K.F., Chalmers, I., Hayes, R.J. & Altman, D.G. (1995). Empirical evidence of bias. *Journal of the American Medical Association*, 273, 408–412.
- Srinivasan, T.N. & Thara, R. (2001). Beliefs about causation of schizophrenia: Do Indian families believe in supernatural causes? *Social Psychiatry and Psychiatric Epidemiology*, 36, 134–140.
- Van Gijn, J. & Bonke, B. (1977). Interpretation of plantar reflexes. *Journal of Neurology, Neurosurgery and Psychiatry*, 40, 787–789.
- Vickers, A., Goyal, N., Harland, R. & Rees, R. (1998). Do certain countries produce only positive results? *Controlled Clinical Trials*, 19, 159–166.
- Waddell, G., Aylward, M. & Sawney, P. (Eds.) (2002). *Back pain, incapacity for work and social security benefits*. Royal Society of Medicine Press.
- Wade, D.T. & Halligan, P.W. (2003). New wine in old bottles: The WHO ICF as an explanatory model of human behaviour. *Clinical Rehabilitation*, 17(4), 349–354.
- Wade, D.T. & Halligan, P.W. (2004). Do biomedical models of illness make for good healthcare systems? *British Medical Journal*, 329, 1398–1401.
- Weinman, J. & Petrie, K.J. (1997). Illness perceptions: A new paradigm for psychosomatics? *Journal of Psychosomatic Research*, 42, 113–116.
- White, P. (2005). *Biopsychosocial medicine*. Oxford: Oxford University Press.