



GRESHAM COLLEGE
Founded 1597

Mind over matter Transcript

Date: Tuesday, 11 December 2012 - 6:00PM

Location: Museum of London



11 December 2012

Mind over Matter

Professor Glenn D Wilson

Literally, mind over matter would refer to *psychokinesis*, the capacity to move objects by mind power alone. There is no evidence that this is possible; any small effects found can be put down to selective publication. Magician James Randi has issued a challenge that he would give \$1 million to anyone who can demonstrate such an ability under properly controlled conditions; so far there have been no takers. One is reminded of the old music hall joke: "Anyone who believes in psychokinesis, raise my hand".

Some phenomena that might seem to entail mind over matter involve no such thing.

Fire-walking practised by Japanese priests and others as a purification or endurance ritual. It was once thought by Western observers to require mysterious powers and special preparation. Later it was discovered that anyone can do it, without incantation, provided certain precautions are taken and it is now a common exercise at "motivational" weekends. It even helps to be a bit nervous, since sweat is part of the protective effect.

The Wild West was rife with snake-oil salesmen but quack "cures" and "alternative" treatments remain popular today. Most have no credible basis. Homeopathic medicine, for example, is often so dilute that it contains no molecules of "active" ingredient; the water is said to remember it. Acupuncture and reflexology are based on bizarre, ancient theories with no anatomical logic. Despite that, many people swear by these methods. What is going on here?

Suggestion is a powerful force. The *Placebo Effect* (literally "I shall please") refers to alleviation of symptoms due to the belief that one is being treated and the expectation that one will get better (in addition to any physical properties of the medicine). Placebos range from dummy pills and sham surgery to encouraging words, like "you should be better in a couple of days". They are routinely used as controls in the evaluation of treatment and are often difficult to beat.

Placebos are not the same as no-treatment or "wait-list" controls in that they usually give some degree of added value. Many disorders spontaneously recover with time alone. Other components to the placebo effect that clinical trials usually try to minimise (Ernst, 2007) include the doctor-patient relationship (bedside manner) and assurance that the medicine has "clinically proven" potency. There is also regression to the mean; since patients usually seek help at times of peak distress, they are likely to improve simply on the "law of averages".

Symbols of medical authority (diplomas, white coats, stethoscopes, etc.) enhance the placebo effect. Warm coloured pills are better as stimulants, cool-coloured pills are better for anxiety and insomnia. Pills work better when they are large and expensive and two is better than one. Capsules are more effective than tablets, while injections beat both (Kaptchuk et al, 2006).

Placebos are generally more effective when they are believable but seem to work even without deception - the patient having been informed that their pills are inert. A high proportion of doctors use placebos and have little ethical compunction about doing so, though they are more likely to prescribe vitamins and over the counter analgesics (which may have some potential benefit) than sugar pills (Tilburt et al, 2008).

Not everyone responds to placebos (only about 30-50%) and they are ineffective for certain conditions (e.g. blood poisoning). Individuals who respond most to placebos are high in optimism (Geers et al, 2010). They also tend to be high on the traits of Ego-resiliency, Altruism and Straightforwardness, and low on Anger/Hostility (Pecina et al, 2012). Clearly, placebo responders are not simply gullible, stupid or otherwise "weak" in personality.

The precise effect of a placebo depends on what is expected. The belief that one has imbibed alcohol results in intoxication. Sham arthroscopy of the knee-joint results in improved flexibility and reduced pain (Moseley et al, 2002). Physiological effects generally mimic those of active substances. For example, placebo analgesia evokes endorphins and anti-depressant placebos work on the same brain processes as anti-depressant drugs (Diederich & Goetz, 2008; Benedetti & Amanzio, 2011; Petrovic et al, 2002).

Some studies appear to show that acupuncture works (Vickers et al, 2012). Unfortunately, it is difficult to devise suitable placebo controls. "Sham" procedures that involve needling the "wrong" points and retractable needles that do not actually penetrate the skin yield almost equal effects. The better conducted the trial the less acupuncture comes out as superior to placebo (Sing & Ernst, 2008). What is more, even if acupuncture does prove effective, release of endorphins would be a better explanation than the traditional Chinese theory of "meridians" and "balancing of yin and yang".

Just as placebo effects make us feel better there are negative (*nocebo*) forces making us worse. People who have had a voodoo curse put on them sometimes die, either suddenly from shock (c.f., people bitten by a non-venomous snake) or slowly by self-will (e.g., starvation). For this reason doctors need to be cautious about telling people they are terminally ill.

In a study of what he called *The Hound of the Baskervilles Effect*, Phillips (2001) found that, consistent with Japanese and Chinese belief that the number 4 is unlucky, their cardiac mortality peaks on the 4th day of each month. This relationship did not appear in a control group of White Americans. Christenfeld et al (1999) found that people with positive initials (e.g. A.C.E. or V.I.P) lived several years longer than those with negative initials (e.g. P.I.G. or D.I.E). This finding they put down to self-esteem. There is also evidence that people are more likely to die just after a major birthday or holiday than before, as though holding out for the special occasion.

Feelings of well-being reduce overall mortality (Chida & Steptoe, 2008). By contrast, negative life events such as divorce, death of a loved one, loss of a job, catastrophes and earthquakes have cardiovascular consequences (Phillips & Carroll, 2009). When England lost a penalty shoot-out against Argentina in the 1998 football World Cup, emergency admissions to hospital in England increased by 25%.

Psychogenic factors affect the ability of the immune system to fight off cancers. Fagundes et al (2012) found that skin cancer patients who had suffered neglect or maltreatment as children are at greater risk of their cancer returning when they face a major current stressful event. This appears to be because certain cancers are normally contained by the immune system, which may be impeded by life stress. The same could apply to more lethal "immunogenic" tumours such as melanoma and ovarian cancer. Cohen (2012) found that chronically stressed people are more likely to contract a cold when exposed to the virus because their immune function was depressed.

If stress alters the risk of disease is personality also prognostic? There is little evidence for the idea that suppression of toxic emotions contributes to cancer (De Vries et al, 2012). Nor is Extraversion or Neuroticism associated with any kind of cancer or its survival (Nakaya et al, 2010). The trait of hostility (one aspect of so-called *Type A* personality) does go with a higher risk of coronary heart disease (Myrtek, 2001) but the effect is small and irascibility could be an early symptom of the disease rather than a cause of it. *Type D* (Distressed) personality, featuring all forms of negative affect (anxiety, depression & hostility) appears to predict worse cardiovascular outcomes (Denollet et al, 2010). However, it is difficult to separate real symptoms from a complaining nature.

A procedure that attempts to mobilise psychological factors in the treatment of cancer and other diseases is called *guided imagery*. Patients are helped to focus on dream-like scenarios that would induce feelings of safety, relaxation and happiness. Another method is to have them imagine their immune system gobbling up cancer cells and their tumour shrinking. These approaches can be supportive in reducing pain and distress but they have less impact on physical symptoms and there is no evidence that they can cure cancer (Roffe et al, 2005).

A fundamental principle of learning is that knowledge of results is helpful. *Biofeedback* works on the theory that if people are able to monitor their own physiological processes with devices such as the EEG, ECG, skin conductance or skin temperature, they are better able to take control of them. There is abundant evidence that this is a useful adjunct to therapy for conditions such as anxiety, panic and headaches (Yucca & Montgomery, 2008).

Conversion disorders are conditions such as paralysis, blindness and amnesia that are apparently psychogenic. They are so-called because psychological stress is presumed to have been "converted" into a physical disability. They may be difficult to distinguish from malingering and true somatic damage. Clues as to their psychogenic origin include: (1) a precipitating psychological trauma, (2) an emotional indifference to the handicap (3) some secondary benefit such as escape from the battlefield, (4) the retention of normal reflexes. Miracle cures, such as might be obtained at Lourdes, are more likely to be obtained with conversion disorders than somatic ones, though faith-healing might help others via stress reduction and placebo.

Stigmata are crucifixion-style wounds appearing in devout Catholics since St Francis of Assisi in 1224. Some may be fraud (Luzzatto, 2007), some self-inflicted in association with visions during fasting (Fessler, 2002). However, a few may be *psychogenic purpura* - symmetrical purple blotches from internal bleeding due to powerful self-suggestion (Anderson et al, 1999). The appearance of wounds on the palms rather than the wrists owes more to mediaeval paintings than actual Roman execution procedures. Similar phenomena have been known to occur under hypnosis, e.g., alien abduction victims presenting marks associated with the medical examinations they believe they have endured.

Hypnosis provides a powerful example of the power of suggestion. It began with the *animal magnetism* of Anton Mesmer but was soon recognised as due, not to the effects of actual magnets, so much as his own personal magnetism and powers of persuasion. Hypnotic induction involves suggestions of sleep, relaxation, focused attention and compliance. There are stable individual differences in hypnotic suggestibility but "good" subjects should not be considered weak-minded. They need to actively cooperate with the hypnotist, concentrate, and mobilise imagination in order to enter the trance state. Once there, they are open to suggestions agreed in advance as beneficial to them. For example, they may be told they can make speech with confidence or that their cigarettes taste foul.

The effects of hypnosis to go beyond simple role-playing (it is more like total absorption in a movie) and there are notable similarities between the effects of hypnosis and "hysterical" symptoms. However, it is doubtful that people can perform feats of super strength and endurance that would be impossible in a highly motivated waking state (Nash & Barnier, 2008). Hypnosis is not useful as a memory booster; it is more likely to elicit *false*

memories (e.g., previous life experiences, alien abduction and “recovered” recollections of child sexual abuse).

Hypnosis can be useful as an analgesic (Stoelb et al. 2009). However, not everybody can be hypnotised and it is seldom reliable enough to replace drugs in serious surgery. When it does work, it is probably as through powerful diversion of attention. It may not even necessary to have an external hypnotist (autosuggestion may work as well) and the trance might also be dispensed with. Giving people distracting tasks can reduce the level of pain experienced (Sprenger et al, 2012), while ignoring a wound in the heat of battle is well-known phenomenon.

Hysteria can be contagious. In 1965, at a girl’s school in Blackburn, several girls complained of dizziness and some fainted. Within a few hours, 85 girls had been rushed to hospital by ambulance suffering from symptoms ranging from swooning and moaning to chattering teeth and tetany. No evidence of poisoning or air pollution was found, affected girls were higher in Extraversion and Neuroticism on the Eysenck Personality Inventory than those unaffected (Moss & McEvedy, 1966). From this it was concluded that the episode was due to “hysterical contagion”, albeit triggered by some genuine faintings at a parade the previous day and increased vulnerability due to an earlier outbreak of polio in the area.

This event is typical of what is now called *mass psychogenic illness*, which is observed frequently around the world. Young females in cohesive groups (e.g., schoolgirls and nuns) seem most vulnerable and individuals of a theatrical (*histrionic*) personality type, though this is not always the case (Bartholomew & Wessely, 2002).

Usually there is some precipitating organic event. Following the 2001 anthrax attacks in the U.S. there were more than 2300 false alarms, with many reports of symptoms typical of those expected from anthrax. Because fluoridation of a water supply results in imaginary problems (water tasting foul, goldfish dying, etc.), some authorities have adopted the trick of announcing a false (earlier) date for its introduction in order to defuse complaints.

Historically, outbreaks of mass hysteria, like the medieval dancing plagues and epidemic devil-possession among nuns (during which they may behave with remarkable lewdness), occur in stressed communities (Waller, 2009). In South-East Asia there are odd epidemics of *koro*, in which evil spirits are believed to be causing people’s genitals to shrink inside their bodies. Since complete retraction is believed to be fatal, some men drive pegs through their penis to prevent this happening. In West Africa, men periodically claim their penises have been shrunk or stolen through evil magic. Individuals accused of penis theft may be beaten or lynched (at least 14 were put to death in Nigeria in 2001).

A Channel 4 documentary (*The Town that Caught Tourette’s*) concerned a 2011 outbreak of tics and convulsions among teenage girls from the same school in a small U.S. town (Le Roy, NY). Many of the affected girls seemed to have troubled home lives and a need for attention that was fed by appearances on talk shows. No physical cause was found but one doctor successfully treated some girls with antibiotics (presumably because they were an effective placebo).

Mind and body are clearly intertwined. Few disorders are purely physical or mental. For example, peptic ulcers were once thought to be entirely due to stress but then it was found that 80% involved the bacterium *helicobacter pylori* and would respond to antibiotics. Then it was then noted that four out of five people colonised by *h.pylori* do not develop ulcers, which revived the stress hypothesis. Warts are associated with viruses, yet they sometimes disappear suddenly and mysteriously and so the “wart charmers” remain in business. This is probably because stress diverts immune resources that normally avert them.

Psychosomatic effects are real, not illusory. Their action can be observed in the brain and they have a powerful impact upon our health. We need to study them in order to control their harmful effects and to harness them to our benefit. It may not always be “mind over matter”, but mind certainly does matter.

References

- Anderson, et al (1999) Autoerythrocyte sensitization (psychogenic purpura): A case report and review of the literature. *Paediatric Emergency Care*, 1999, 15, 47-48.
- Bartholomew, R. & Wessely, S. (2002) Protean nature of mass sociogenic illness. *British Journal of Psychiatry*, 180, 300-306.
- Benedetti, F. & Amanzio, M. (2011) The placebo response: How words and rituals change the patient’s brain. *Patient Education and Counselling*, 84, 413-419.
- Chida, Y & Steptoe, A. (2008) Positive psychological well-being and mortality: a quantitative review of prospective observational studies. *Psychosomatic Medicine*, 70, 741-756.
- Christenfeld, N. et al (1999) What’s in a name? Mortality and the power of symbols. *Journal of Psychosomatic Research*, 47, 241-254.
- Cohen, S. et al (2012) Chronic stress, glucocorticoid receptor resistance, inflammation and disease risk. *PNAS*, 109, 1073 (online).
- Denollet, J. et al (2010) A general propensity to psychological distress affects cardiovascular outcomes. *Circulation*, 122, 546-557.
- De Vries, A.M. et al (2012) Alexithymia in cancer patients: A review of the literature. *Psychosomatics and Psychotherapy*, 54, 79-86.
- Diederich, N.J. & Goetz, C.G. (2008) The placebo treatments in neuroscience: New insights from clinical and

neuroimaging studies. *Neurology*, 71, 677-684.

Ernst, E. (2007) Placebo: New insights into an old dilemma. *Drug Discovery Today*, 12, 413-418.

Fessler, D.M. (2002) Starvation, serotonin and symbolism: A psychobiocultural perspective on stigmata. *Mind and Society*, 3, 81-96.

Fagundes, C.P. et al (2012) Basal cell carcinoma, stressful life events and the tumour environment. *Archives of General Psychiatry*, 69, 618-626.

Geers, A.L. et al (2010) Dispositional optimism predicts placebo analgesia. *Journal of Pain*, 11, 1165-1171.

Kaptchuk et al (2006) Sham device v inert pill: randomised controlled trial of two placebo treatments. *British Medical Journal*, 332, 391-397.

Kilstrom, J.F. (2003) Hypnosis and memory. In J.F. Byrne (Ed.) *Learning and Memory* (2nd Edn) Farmington Hills, Mi. Macmillan Reference.

Luzzatto, S. (2007) *Padre Pio: Miracles and Politics in a Secular Age*. Turin: Einaudi.

Moseley, J.B. et al (2002) A controlled trial of arthroscopic surgery for osteoarthritis of the knee. *New England Journal of Medicine*, 347, 81-88.

Moss, P.D. & McEvedy, C.P. (1966) An Epidemic of overbreathing among schoolgirls. *British Medical Journal*, 2, 1295-1300.

Myrtek, M. (2001) Meta-analyses of prospective studies on coronary heart disease, Type A personality and hostility. *International Journal of Cardiology*, 79, 245-251.

Nakaya, N. et al (2010) Personality traits and cancer risk and survival based on Finnish and Swedish registry data. *American Journal of Epidemiology*, 172, 377-385.

Nash, M.R. & Barnier, A.J. (Eds) (2008) *The Oxford Handbook of Hypnosis: Theory, Research and Practice*. Oxford University Press.

Pecina, M. et al (2012) Personality trait predictors of placebo analgesia and neurobiological correlates. *Neuropsychopharmacology*, 1038 (online).

Petrovic, P. et al (2002) Placebo and opioid analgesia: Imaging a shared neuronal network. *Science*, 295, 1737-1740.

Phillips, D.P. (2001) The "Hound of the Baskervilles Effect": A natural experiment on the influence of psychological stress on death. *British Medical Journal*, 323, 1443.

Phillips A.C. & Carroll, D. (2009) Heading for an early grave? *The Psychologist*, 22, 122-125.

Roffe, L. et al (2005) A systematic review of guided imagery as an adjuvant cancer therapy. *Psycho-Oncology*, 14, 607-617.

Sing, J. & Ernst, E. (2008) *Trick or Treatment: The Undeniable Truth About Alternative Medicine*. New York: Norton.

Sprenger, C. et al (2012) Attention modulates spinal cord responses to pain. *Current Biology*, DOI 10.1016.

Stoelb, B.L. et al (2009) The efficacy of hypnotic analgesia in adults: A review of the literature. *Contemporary Hypnotherapy*, 26, 24-39.

Tilbert, J.C. et al (2008) Prescribing "placebo treatments": results of a national survey of US internists and rheumatologists. *BMJ*, 337a1938 (online).

Vickers, A.J. et al (2012) Acupuncture for chronic pain: Individual patient data meta-analysis. *Archives of Internal Medicine*, 3654 (online).

Waller, J. (2009) Dancing plagues and mass hysteria. *The Psychologist*, 22, 644-647.

Yucca, C. & Montgomery, D. (2008) *Evidence Based Practice in Biofeedback and Neurofeedback*. AAPB: Wheatridge, CO.