British Journal of Psychiatry (1994), **164**, 241–243

Whorwell *et al*'s "Physiological Effects of Emotion: Assessment Via Hypnosis"

T. D. ROGERS and DAVID WAXMAN

"Assessment of the physiological effects of physical and emotional stress has been hampered by a lack of suitable laboratory techniques. Since hypnosis can be used safely to induce specific emotional states of considerable intensity, we studied the effect on distal colonic motility of three hypnotically induced emotions (excitement, anger, and happiness) in 18 patients aged 20–48 years with irritable bowel syndrome. Colonic motility index was reduced by hypnosis on its own (mean change 19.1; 95% CI 0.8, 37.3; $P<0.05$) and this change was accompanied by decreases in both pulse (12; 8, 15) and respiration (6; 4, 8) rates ($P<0.001$ for both). Anger and excitement increased the colonic motility index (50.8; 29.4, 72.2; and 30.4; 8.9, 51.9, respectively; $P<0.01$ for both), pulse rate (26; 22, 30; and 28; 24, 32; $P<0.001$ for both), and respiration rate (14; 12, 16; and 12; 10, 14; $P<0.001$ for both). Happiness further reduced colonic motility although not significantly from that observed during hypnosis alone. Changes in motility were mainly due to alterations in rate than in amplitude of contractions. Our results indicate that hypnosis may help in the investigation of the effects of emotion on physiological functions; this approach could be useful outside the gastrointestinal system. Our observation that hypnosis strikingly reduces fasting colonic motility may partly explain the beneficial effects of this form of therapy in functional bowel disorders."

The summary quoted above is from an article by Whorwell *et al* (1992). The present authors were invited to comment upon the study.

T. D. Rogers

The hypnosis literature can be broadly divided into two: studies which measure the efficacy of hypnotherapy, and studies which treat hypnosis as a phenomenon worthy of investigation in its own right. The latter research has tended to be conducted by experimental psychologists who are more concerned with what hypnosis is than how it achieves its putative therapeutic effects. This paper suggests a third area of research – the use of hypnosis to induce a variety of emotions, the physiological consequences of which are then systematically examined in the laboratory. To my knowledge, this is the first paper to place hypnosis in the armamentarium of the psychophysiologist.

Whorwell is known for his previous work on hypnotherapy. In an earlier study (Whorwell *et al*, 1984) he showed that hypnotherapy was more effective than traditional psychotherapy in reducing frequency and severity of symptoms in irritable bowel syndrome. The results were quite dramatic but it was unclear to the authors how hypnosis was able to alleviate such a notoriously refractory condition. Whorwell concluded that further investigation was required, and the present paper represents one step in this process.

The study design is novel. My chief concern is that, by introducing two independent variables, the authors have made the interpretation of their results rather difficult. If it is their intention to examine the effects of *emotion* on colonic motility, rather than the effects of *hypnosis* on colonic motility (and this is the purpose stated in the introduction), then they are making two key assumptions. They assume, firstly, that the emotions generated under hypnosis are similar to those experienced in real life, and secondly that their subjects are representative of the general population (or at least that proportion of the population that suffers from irritable bowel syndrome). The generalisability of their findings depends on how valid these assumptions are.

The first assumption certainly has face validity. To be sure, phenomena such as false memories or pseudomemories can occur under hypnosis, and these may deceive both subject and hypnotist, but the physiological response to emotion is unlikely to be qualitatively different from that of the waking state. However, a quantitative difference in the physiological response is a distinct possibility, given the widespread alterations in involuntary muscle tone and vascular function during hypnosis. As an example of this, hyperaemia of the skin can be induced by verbal suggestion accompanied by light stroking in a hypnotised subject (Hartland, 1971). Hypnosis, despite being a state of physiological and psychological relaxation, appears to be characterised by an exaggerated degree of neurophysiological

responsiveness. The authors might well counter, however, that their results provide a *post hoc* validation of their method, since the increase in colonic motility caused by anger accords with earlier studies in which other techniques were used to induce this emotion.

The second assumption is more problematic. We are told that all 18 subjects suffered from irritable bowel syndrome, and that all were recruited from the hypnotherapy programme and had previously undergone two hypnotherapy sessions. None of the subjects proved to be unhypnotisable. How typical of the general population are these individuals? Is it possible that subjects who are easily hypnotised differ appreciably from those who are not? This simple question uncovers a vexed problem within the hypnosis literature. The hypothesis that hypnotisability may be a biological variable associated with inter-individual differences in brain physiology has been widely debated and investigated over the past 20 years. One of the first biological markers studied was electroencephalogram (EEG) alpha activity, the duration of which appeared to be related to hypnotisability (London *et al*, 1968). However, more recent attempts at replication have failed to find any systematic link between hypnotisability and alpha activity (Perlini & Spanos, 1991). Researchers have now shifted attention from the EEG to neurochemistry, and a positive correlation between hypnotisability and levels of homovanillic acid (a metabolite of dopamine) in the cerebrospinal fluid has been reported (Spiegel & King, 1992). The association between hypnotisability and biological variables remains an open question.

These comments are made not in a critical spirit, but as a general discussion of the background to this paper by Whorwell *et al* (1992). The study has certainly raised a number of interesting theoretical questions. Their approach to the subject appears to be admirably practical: they have a treatment programme; it appears to work; and they are testing it to the limits. I agree with the final sentence of their summary – that their observations shed light on the mode of action of hypnotherapy for irritable bowel syndrome. I am not convinced, however, for the reasons given above, that this technique will prove useful in the psychophysiology laboratory generally.

David Waxman

The physiological effects of emotion may involve one or more of a variety of symptoms which can dominate the thoughts, and the fears, and indeed the very behaviour and daily activities of the subject. In some instances, the life of the entire family will revolve around such a problem. No condition affords greater proof of this statement than that of the irritable bowel, and indeed there could be few people who are not aware of the influences of stress on the activities of the gastrointestinal tract.

As a result, almost half of the referrals to gastroenterology clinics suffer from the irritable bowel syndrome (IBS) (Switz, 1976). Emotional and physiological factors in the pathogenesis of this condition have been widely discussed, and possible pathological origins explored (Read, 1985; Eastwood *et al*, 1987; Waxman, 1988; Brook, 1991).

The physiological responses to emotion may be controlled by the use of hypnosis; while functional bowel disorders generally react to calming suggestions given to the hypnotised person, additional techniques are required to achieve more permanent results (Waxman, 1980).

Instruments for the measurement of the physiological effects of emotion have been available for many years, most commonly recording skin conductance, muscle activity, and heart rate. Now, however, in a unique and interesting research project, Whorwell *et al* (1992) have used suggestion under hypnosis as the vehicle both for varying the emotional status of patients suffering from IBS and for recording those changes by measuring the variations in colonic motility which result.

Any therapist experienced in the use of hypnosis can produce feelings of calmness and composure in a responsive subject, but testing for a positive response is advisable, and cannot always be assumed by the appearance of the hypnotised person. The classical method is the 'ideomotor' finger-signalling technique (Le Cron, 1952), in which the index finger will rise when the subject is experiencing the suggestions given. Thus, the stimulus and the emotional and physiological effects may all be controlled and confirmed under hypnosis.

Whorwell *et al* make the point that laboratory-induced stress may not be relevant to that experienced in everyday life. Under hypnosis, however, such emotions may be experienced with great reality when the appropriate suggestion is given. They also note that the responses to emotions of anger, aggressiveness, or hopelessness may vary in different people, and that this variation may hinder the analysis of their effect. Although even the pleasurable things in life may be disturbing and challenging, happiness and excitement are normally difficult to produce in the laboratory. Yet almost any emotional state can be brought about in a good and well motivated subject while under hypnosis. Given the correct suggestions, this state can be altered or reversed, where appropriate, and the charge will be without adverse

effects. Thus, with suitable equipment, the effects on colonic motility during these varied emotional states can be recorded and measured.

A total of 18 patients were entered for this study (5 male and 13 female, age 20–48 years); although the symptoms varied, each subject was diagnosed as suffering from IBS. Each was recruited from the specific hypnotherapy treatment programme of the hospital gastroenterology department, and had already undergone two sessions of hypnosis. Thus, two essential ingredients – hypnotisability and positive motivation – were assured. The colonoscopic equipment was linked up with a computer, and pre-hypnosis colonic motility recordings could then be analysed. After the patient was given a 30-minute rest, colonic motility was recorded for 15 minutes. Patients were then hypnotised by the method known as eye fixation with progressive relaxation, using standard deepening procedures (Waxman, 1981). Subsequently, for five consecutive 15-minute periods, relaxation, anger and excitement or happiness were suggested, and each patient underwent two of these induced emotional states.

Any possible adverse effects induced by the emotion were monitored and then countered by inducing a pleasing emotional experience before awakening. Patients were asked to confirm at the end of the study that the emotion suggested had in fact been experienced. Colonic motility was recorded for each emotion suggested: it was found that hypnosis strikingly reduced fasting distal colonic motility, while anger and excitement increased motility, and happiness decreased it.

These results, although not surprising, are significant in that the assessment was made in hypnosis; they confirm the value and possible future uses of this method.

Although the use of suggestion as a means of altering man's behaviour has been known since time immemorial, hypnosis has emerged over the past 200 years to become a valuable psychotherapeutic instrument. It largely fell into disuse as a result of being abandoned by Freud, but interest was again to emerge in the latter half of this century, not only using dynamic exploration and behavioural techniques in treatment, but also in the study of its own phenomena and of the neurophysiological processes involved.

The use of hypnosis for modifying unacceptable physiological responses to emotion is also well known (Waxman, 1980) and is the basis of its general medical and psychiatric use. Whorwell *et al* have now applied this technique in order to assess these effects, thus filling an important gap in the research and literature on the subject. In so doing, they have also established the validity of the use of hypnosis in the treatment of psychosomatic illness, as well as in a wider range of neurotic symptoms.

References

Brook, R. (1991) Bowel distress and emotional conflict. *Journal of the Royal Society of Medicine*, **84**, 39–42.

Eastwood, M. A., Eastwood, J. & Ford, M. J. (1987) The irritable bowel syndrome: a disease or a response? Discussion paper. *Journal of the Royal Society of Medicine*, **80**, 219–221.

Hartland, J. (1971) *Medical and Dental Hypnosis and its Clinical Applications*. London: Baillière Tindall.

Le Cron, L. M. (1952) *Experimental Hypnosis*. New York: Macmillan.

London, P., Hart, J. T. & Leibovitz, M. A. (1968) EEG alpha rhythms and susceptibility to hypnosis. *Nature*, **219**, 71–72.

Perlini, A. H. & Spanos, N. P. (1991) EEG alpha methodologies and hypnotizability. A critical review. *Psychophysiology*, **28**, 511–530.

Read, N. W. (1985) *Irritable Bowel Syndrome*. London: Grune & Stratton.

Spiegel, D. & King, R. (1992) Hypnotisability and CSF HVA levels among psychiatric patients. *Biological Psychiatry*, **31**, 95–98.

Switz, D. M. (1976) What the gastroenterologist does all day. *Gastroenterology*, **70**, 1048–1050.

Waxman, D. (1980) Clinical applications of hypnosis in psychiatry. *British Journal of Hospital Medicine*, May, 456–463.

—— (1981) *Hypnosis: A Guide for Patients and Practitioners*. London: George Allen & Unwin.

—— (1988) The irritable bowel: a pathological or a psychological syndrome? *Journal of the Royal Society of Medicine*, **81**, 718–720.

Whorwell, P. J., Houghton, L. A., Taylor, E. E., *et al* (1992) Physiological effects of emotion: assessment via hypnosis. *Lancet*, **340**, 69–72.

——, Prior, A. & Faragher, E. B. (1984) Controlled trial of hypnotherapy in the treatment of severe refractory irritable bowel syndrome. *Lancet*, *ii*, 1232–1234.

T. D. Rogers, *Senior Registrar, The Royal Edinburgh Hospital, Morningside Terrace, Edinburgh EH10 5HF*; David Waxman, LRCP, MRCS, *Associate Specialist in Psychiatry (retired), Central Middlesex Hospital, London, and 86 Harley Street, London W1N 1AE*