CONTEMPORARY HYPNOSIS

ISSN 0960-5290

www.interscience.wiley.com/journal/ch

WILEY-BLACKWELL

THE JOURNAL OF THE BRITISH SOCIETY OF CLINICAL AND ACADEMIC HYPNOSIS PUBLISHED BY JOHN WILEY & SONS

Contemporary Hypnosis (1999)
Vol. 16, No. 2, pp. 55–67

EXPERIENCING AND TESTING HYPNOTIC ANAESTHESIA

Kevin M. McConkey, Gemma L. Gladstone and Amanda J. Barnier

University of New South Wales, Sydney, Australia

Abstract

High- and low-hypnotizable subjects ('Highs' and 'Lows') were given a suggestion for hypnotic anaesthesia in the palm of their left hand. Their responses to the suggestion were investigated through verbal ratings of the impact of stimuli of different strengths (aesthesiometer), through a dial method of obtaining continuous, concurrent ratings of the degree of anaesthesia, and through retrospective verbal ratings of subjects' success of and belief in anaesthesia. The stimulus ratings of subjects indicated that they acknowledged a change in the strength of the aesthesiometer across two tests. However, the dial ratings showed that there was no corresponding shift in their experience of anaesthesia. The retrospective ratings of success and belief showed a complex pattern of association with the stimulus ratings and the dial ratings. The findings are discussed in terms of the theoretical and methodological issues involved in drawing inferences about experiencing and testing hypnotic anaesthesia, in particular, and about external and internal influences on hypnotic phenomena more generally.

Key words: hypnosis, hypnotizability, anaesthesia, analgesia, assessment, experience

Introduction

Hypnotic anaesthesia and analgesia involve a suggestion for total or partial loss of sensitivity in a particular area of the body. Usually, hypnotic *anaesthesia* involves a suggestion for a loss of sensory awareness and hypnotic *analgesia* involves a suggestion for the reduced experience of a noxious stressor. The nature of hypnotic anaesthesia and analgesia have been investigated in various experimental and clinical reports, and the findings have been interpreted from a number of theoretical perspectives (e.g. Sutcliffe, 1961; McGlashan et al., 1969; Garratt and Wallace, 1975; Hilgard, 1977; Hilgard et al., 1978; Wallace and Hoyenga, 1980, 1981; Hilgard and Hilgard, 1983; Miller and Bowers, 1986; Spanos, 1986; Tripp and Marks, 1986; Spanos and Katsanis, 1989; Erickson, 1994; Crasilneck, 1995; Enqvist et al., 1995). Overall, the findings indicate that high-hypnotizable individuals can experience hypnotic anaesthesia and analgesia in a compelling way and that such phenomena can assist in the management of both acute and chronic pain.

We have been investigating the subjective experience and behavioural reactions of subjects to hypnotic anaesthesia and in particular their response to different ways of testing that phenomenon in the experimental setting (McConkey et al., 1989; McConkey et al., 1990; Wilton and McConkey, 1994; Barnier et al., 1997; Wilton et al., 1997). For instance, Wilton and McConkey (1994) placed ordinary objects into the anaesthetized and non-anaesthetized hands of high-hypnotizable subjects and

asked them to identify those objects. The subjects who reported experiencing complete anaesthesia identified fewer objects in the anaesthetized than in the non-anaesthetized hand. Notably, some subjects who experienced complete anaesthesia identified none of the objects, and other subjects identified some or all of the objects in the anaesthetized hand. Moreover, those subjects who did not identify any objects reported greater success in experiencing anaesthesia, than did subjects who identified at least one object in the anaesthetized hand. Finally, those subjects who did not identify any objects reported greater belief in the reality of their anaesthesia than did those subjects who identified at least one object in their anaesthetized hand. Notably, the external reality of the task of identifying objects did not decrease the reported success or belief for subjects who did not identify any of the objects; in fact, their ratings of success in experiencing anaesthesia increased from before to after the object task.

This finding is consistent with the notion that interpretations of and attributions about hypnotic experience can be made by subjects in a way that reinforces experience and behaviour consistent with that requested by the hypnotist (e.g. Bryant and McConkey, 1989a, 1989b, 1990; McConkey, 1990, 1991). Moreover, it underscores the complexities involved when an internal, subjective experience is tested through the presentation of an external, objective stimulus. Similar complexities have been seen when hypnotic anaesthesia has been assessed in clinical and experimental settings through the use of the circle-touch test. This test involves suggesting to subjects that a circular area marked on their hand is anaesthetized and then testing their response to touches inside and outside that defined area (e.g. Arons, 1967; Orne et al., 1984; Ebilmayr, 1987; McConkey et al., 1989, 1990; Barnier et al., 1997; Wagstaff, 1997; Wilton et al., 1997). For instance, Wilton et al. (1997) investigated the effect of the circle-touch test instructions on the display of hypnotic anaesthesia. Their findings indicated that hypnotized individuals can experience suggested anaesthesia in a compelling way and can sustain that experience when tested by aesthesiometers. In addition, they reported that subjects' success in achieving anaesthesia and their belief in the genuineness of the experience were associated with hypnotizability. Wilton et al. (1997) considered that these findings underscored that hypnotic experiences and the interpretations and attributions that subjects make about those experiences require a theoretical framework that recognizes the interactive influence of the factors in the hypnotic setting and the abilities of the hypnotized individual.

The aim of the present experiment was to extend previous research by investigating the impact of external stimulus events and to use a new method of indexing the internal experience of hypnotic anaesthesia. In the present experiment, high- and low-hypnotizable subjects ('Highs' and 'Lows') were given a suggestion for hypnotic anaesthesia in the palm of their left hand. Hypnotic anaesthesia was investigated in three different ways.

First, to explore the impact of external stimulus events on subjects' experience of anaesthesia, two aesthesiometers ('weak' and 'strong') were used, and subjects were touched with these three times: before the anaesthesia suggestion was given (Pre-test), after it was given (Test 1) and before it was cancelled (Test 2). The same aesthesiometer was used in the Pre-test and Test 1, and either the same or a different one was used in Test 2. At each application, subjects rated verbally how much they felt the stimulus. This allowed us to determine how subjects experienced the effect of different stimuli and how they experienced a change in those stimuli (see also McGlashan et al., 1969).

Second, throughout the suggestion, test and cancellation, subjects were asked to turn a dial to indicate the degree of anaesthesia they were experiencing. Drawing on previous work (Cheek, 1959; Evans and Orne, 1965, 1971; Field, 1966; Orne and Evans, 1966), we have developed this dial method to provide a continuous and concurrent measure of the hypnotic experience of the individual subject. In experiments using this method (McConkey et al., 1999; McConkey et al., submitted; see also Barnier et al., 1997) subjects were told that turning the dial all the way to the left means they are not at all experiencing the suggestion, and turning the dial all the way to the right means they are completely experiencing the suggestion; the dial is connected to a computer that records its position every second across the item. By this method, subjects physically, rather than verbally, indicate their experience of the hypnotic phenomenon from when it is first introduced until the hypnotist indicates it is over. These dial ratings allow fine-grained shifts in experience within and across individuals to become transparent. In the present experiment, we were interested in how the external stimulus events would influence the internal experience of the hypnotized individual as indexed by the dial method.

Third, as in Wilton and McConkey (1994) and Wilton et al. (1997), after hypnotic de-induction subjects were asked retrospectively to rate how successful they thought the suggestion for anaesthesia was and how much they believed at the time that their palm was anaesthetized.

In summary, hypnotic anaesthesia was investigated through verbal ratings of the stimulus effect, dial ratings of the degree of anaesthesia, and retrospective verbal ratings of the success of, and belief in, anaesthesia. This multi-method approach allowed us to look for points of convergence and divergence among indices of the impact of the external stimulus and the nature of the internal experience.

Method

Subjects

Thirty-two high-hypnotizable (24 female, 8 male; mean age = 18.96 years, SD = 1.71) and 32 low-hypnotizable (18 female, 14 male; mean age = 22.72 years, SD = 9.08) first-year psychology students at the University of New South Wales, Sydney, Australia, participated in the study in return for research credit. They were selected on the basis of their performance on the 12-item *Harvard Group Scale of Hypnotic Susceptibility, Form A* (HGSHS:A) (Shor and Orne, 1962) and on a 10-item tailored version of the *Stanford Hypnotic Susceptibility Scale, Form C* (SHSS:C) (Weitzenhoffer and Hilgard, 1962). 'Highs' scored 9–12 on the HGSHS:A (mean = 10.12, SD = 1.24) and 8–10 on the SHSS:C (mean = 8.97, SD = 0.78); 'Lows' scored 0–4 on the HGSHS:A (mean = 2.13, SD = 1.07) and 0–3 on the SHSS:C (mean = 1.94, SD = 0.95).

Apparatus

Aesthesiometers

Two Semmes–Weinstein pressure aesthesiometers were used as the test stimuli. The aesthesiometers differed in the amount of pressure they produced when applied to the skin. The *weak* stimulus, which was calibrated to bend with the application of 4.17 g of pressure, applied a pressure just above detection threshold (as determined by pilot testing). The *strong* stimulus, which was calibrated to bend with the application of 5.46 g of

pressure, applied a pressure above detection threshold (as determined by pilot testing). Half the subjects received the strong stimulus first and half received the weak stimulus on the first test; also, half the subjects received the same stimulus on the second test, and half received the different stimulus on the second test. Note, for the Pre-test, subjects received the same stimulus as for Test 1.

Dial

The dial was positioned on the right arm of the subject's chair. It consisted of a semi-rotatable disc of 70 mm diameter fixed to a stationary base. There was a pointer on the dial and a mark on the base at halfway that allowed subjects to feel how far they had turned the dial. The dial rotated through 100°; the rotation end positions indicated that subjects were experiencing normal sensation in the palm (100) or were experiencing total loss of sensation (anaesthesia) in the palm (0). Position 100 was 50° right of centre, Position 0 was 50° left of centre; the dial was set at Position 100 at the beginning of the item. The dial was connected to a personal computer (via the joystick port) and a DOS-based computer program recorded the position of the pointer each second. Recording of the position of the dial could be controlled via the computer keyboard. The resolution of the recording of the position of the dial was ±0.5°.

Procedure

After welcoming subjects, the experimenter asked them to read and sign an informed consent form. A 10-item tailored version of the SHSS:C, which included the hypnotic anaesthesia item, was then administered. Before giving the anaesthesia suggestion, the experimenter administered the Pre-test with the aesthesiometer. She touched the centre of subjects' left palm with the aesthesiometer and asked them to rate verbally how much they felt the stimulus (1 = *'not at all'*; 10 = *'as normally as possible'*). Following this, the experimenter gave instructions for use of the dial; these instructions were given while subjects were hypnotized and their eyes remained closed. Specifically, subjects were told that soon they would find all the feeling in the palm of their left hand fading away, and that they should use the dial to indicate the degree of anaesthesia that they were experiencing at each moment. Subjects were told that when they moved the dial all the way to the left it meant that there was *'no feeling in their palm'* and when they moved the dial all the way to the right it meant that *'their palm was feeling as normal as possible'*. The subjects were then given an opportunity to practise using the dial before being asked to return it to its original position all the way to the right. Finally, subjects were reminded to continue using the dial throughout everything that occurred from when they were told to begin until they were told to stop.

Following this, subjects were told to begin using the dial, a key on the computer was pressed to begin recording the position of the dial, and the suggestion for anaesthesia was given. This suggestion took 140 seconds. In part, the experimenter said:

> *Soon you will notice that you can feel less and less of your left palm, your palm is losing all feeling. Notice that all sensation in your palm is fading away and that you can feel your palm less and less. Soon it will be completely anaesthetized, you will not be able to feel your palm at all. Any remaining feeling you have in your palm is flowing out of your hand, maybe the feeling is flowing down out of your hand through your fingertips ...feeling is flowing out of the palm of your hand, it's just disappearing from your hand. ...Your palm will stay this way, completely without feeling until I say to you that your hand is right back to normal again.*

At the end of the suggestion, the experimenter pressed a key on the computer to mark the end of the suggestion. A 10-second interval was then allowed. At the end of this time, Test 1 was administered. The centre of the subject's palm was touched with either the weak or the strong aesthesiometer, a key on the computer was pressed to mark the position of Test 1 and subjects were asked to rate how much they felt the stimulus (1= *'not at all'*; 10 = *'as normally as possible'*). The experimenter then waited for the subjects' verbal ratings and allowed a 10-second interval before administering Test 2. As in Test 1, the centre of the subject's palm was touched with either the same or a different aesthesiometer, a key on the computer was pressed to mark the position of Test 2, and subjects were asked to rate how much they felt the stimulus. The experimenter then waited for their verbal ratings and allowed another 10-second interval before administering a 30-second cancellation of the suggestion; a key on the computer was then pressed to mark the end of the cancellation. Following a further 10-second interval, subjects were instructed to stop using the dial and a key on the computer was pressed to finish recording the dial's position. Note that during tests 1 and 2, subjects were required both to make a verbal rating of how much they felt the stimulus and to continue using the dial to indicate their degree of anaesthesia.

The experimenter then administered the remaining SHSS:C items and a standard de-induction procedure. Following this, a brief post-experimental inquiry was conducted in which subjects were asked about their experience of the anaesthesia item. In particular, subjects were asked: *'Can you tell me how successful you thought the suggestion for anaesthesia – not feeling anything in your palm – was?'* (1 = *'not at all successful'*; 10 = *'extremely successful'*) and *'Can you tell me how much you believed at the time that your palm was anaesthetized – that you couldn't feel anything in your palm?'* (1 = *'did not believe at all'*; 10 = *'believed completely'*). Finally, the experimenter answered any questions, thanked subjects for their participation and ended the session.

Results

To index the initial effect of the anaesthesia suggestion, the change in stimulus ratings from before to after the suggestion was first examined; that is, from Pre-test to Test 1. A 2 (hypnotizability) x 2 (stimulus) x 2 (test) mixed-model analysis of variance (ANOVA) yielded significant main effects for hypnotizability ($F(1,60) = 25.54$, $p<0.001$) and for test ($F(1,60) = 80.15$, $p<0.001$), and a significant interaction between hypnotizability and test ($F(1,60) = 14.54$, $p<0.001$). Although 'Highs' (mean = 7.31, SD = 2.47) and 'Lows' (mean = 8.70, SD = 1.94) made similar stimulus ratings at Pre-test, 'Highs' (mean = 3.70, SD = 2.17) made appreciably lower ratings than did 'Lows' (mean = 7.25, SD = 2.45) at Test 1. Next, the change in dial ratings of anaesthesia were examined, from the beginning of the suggestion to just before Test 1; for analysis, this period of 170 seconds was divided into three phases. A 2 (hypnotizability) x 2 (stimulus) x 3 (phase) mixed-model ANOVA yielded significant main effects for hypnotizability ($F(1,60) = 22.75$, $p<0.001$) and for phase ($F(2,120) = 32.79$, $p<0.001$), and a significant interaction between hypnotizability and phase ($F(2,120) = 12.12$, $p<0.001$. Whereas the dial ratings for 'Highs' decreased appreciably across the phases (mean = 82.69, SD = 24.12; mean = 65.11, SD = 35.03; mean = 47.81, SD = 44.92, respectively), those for 'Lows' remained relatively constant (mean = 98.36, SD = 1.84; mean = 94.06, SD = 11.92; mean = 89.85, SD = 18.92, respectively). Thus, both the verbal ratings and the dial ratings indicated that the suggestion for anaesthesia was

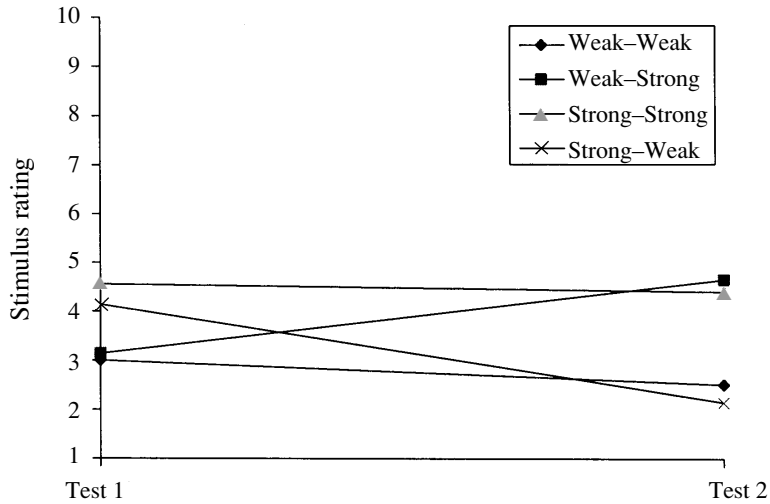
influencing the internal and external experience of 'Highs', but was not influencing the experience of 'Lows'.

To index the effect of the tests during anaesthesia, the change in stimulus ratings from Test 1 to Test 2 were examined first. Figure 1 presents the stimulus ratings on Test 1 and Test 2. The data were analysed separately for 'Highs' and 'Lows'. For 'Highs', a 2 (stimulus) x 2 (change) x 2 (test) mixed-model ANOVA yielded significant interactions between stimulus and test ($F(1,28) = 11.86$, $p<0.005$), and among stimulus, change and test ($F(1,28) = 16.97$, $p<0.001$). For 'Lows', a similar analysis yielded a significant main effect for stimulus ($F(1,28) = 5.12$, $p<0.05$) and significant interactions between stimulus and test ($F(1,28) = 24.23$, $p<0.001$) and among stimulus, change and test ($F(1,28) = 21.00$, $p<0.001$). In other words, for both 'Highs' and 'Lows' the stimulus ratings were similar across the tests when the stimuli was the same (i.e. weak–weak, strong–strong) and the stimulus ratings changed across the tests when the stimuli changed (i.e. weak–strong, strong–weak); specifically, when the stimulus changed from weak to strong, the stimulus ratings increased (i.e. subjects felt it more), and when the stimulus changed from strong to weak, the stimulus ratings decreased (i.e. subjects felt it less). The change in dial ratings of anaesthesia from just before Test 1 to just after Test 2 was also examined; this period of 80 seconds was divided into eight phases. Figure 2 presents the dial ratings of anaesthesia across the eight phases. For 'Highs', a 2 (stimulus) x 2 (change) x 8 (phase) mixed-model ANOVA yielded a significant main effect for phase ($F(7,196) = 3.09$, $p<0.005$). For 'Lows', a similar analysis yielded no significant main or interaction effects. In other words, for 'Highs' but not for 'Lows', the ratings of anaesthesia decreased across Test 1 and Test 2 (i.e. where 100 means 'normal feeling in palm' and 0 means 'no feeling in palm'); in other words, the experience of anaesthesia was stronger. Thus, a change in the stimuli across the tests was reflected in a change in the stimulus ratings, but this change in the stimuli was not reflected in a change in the dial ratings of anaesthesia.

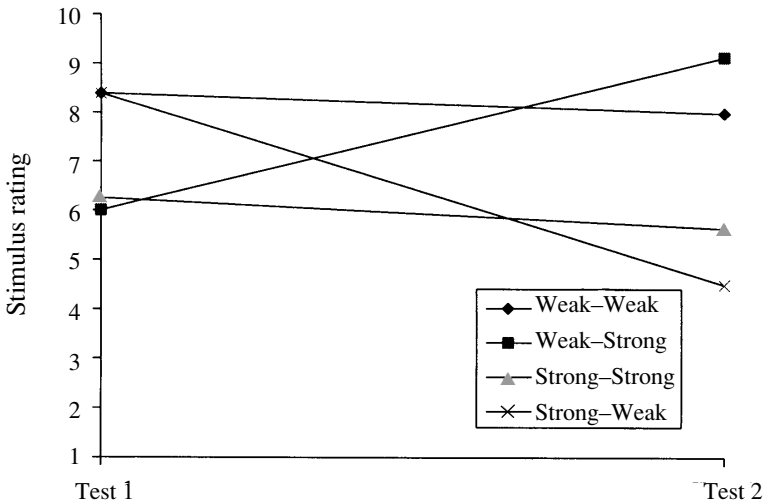
To index subjects' overall perceptions of their experience, their retrospective ratings of success of and belief in anaesthesia were examined. Table 1 presents those retrospective ratings of success and belief. For success, a 2 (hypnotizability) x 2 (stimulus) x 2 (change) ANOVA yielded a significant main effect for hypnotizability ($F(1,56) = 6.24$, $p<0.05$) and a significant interaction between hypnotizability and stimulus ($F(1,56) = 4.80$, $p<0.05$). For belief, a similar analysis yielded a significant main effect for hypnotizability ($F(1,56) = 11.26$, $p<0.001$). In other words, 'Highs' rather than 'Lows' gave higher ratings of success of and belief in anaesthesia. Also, 'Highs' but not 'Lows' who were given the weak rather than the strong stimulus on Test 1 gave higher ratings of success of anaesthesia.

In addition to considering the different variables that indexed the effect of the external events (i.e. stimulus ratings) and the nature of the internal experience (i.e. dial ratings and retrospective ratings), the relationship among these variables was examined. The stimulus ratings on Test 1 and Test 2 were related to the dial ratings across each of the eight phases from just before Test 1 to just after Test 2 for 'Highs' (for Test 1, $r = 0.35–0.41$, $p<0.05$; for Test 2, $r = 0.35–0.42$, $p<0.05$), and across the last four phases for Test 1 and the last five phases for Test 2 for 'Lows' (for Test 1, $r = 0.40–0.44$, $p<0.05$; for Test 2, $r = 0.36–0.41$, $p<0.05$). The stimulus ratings on Test 1 and Test 2 were related to success ratings for 'Highs' (for Test 1, $r = –0.64$, $p<0.001$; for Test 2, $r = –0.50$, $p<0.005$), and on Test 1 for 'Lows' (Test 1, $r = –0.38$, $p<0.05$).

High hypnotizable



Low hypnotizable

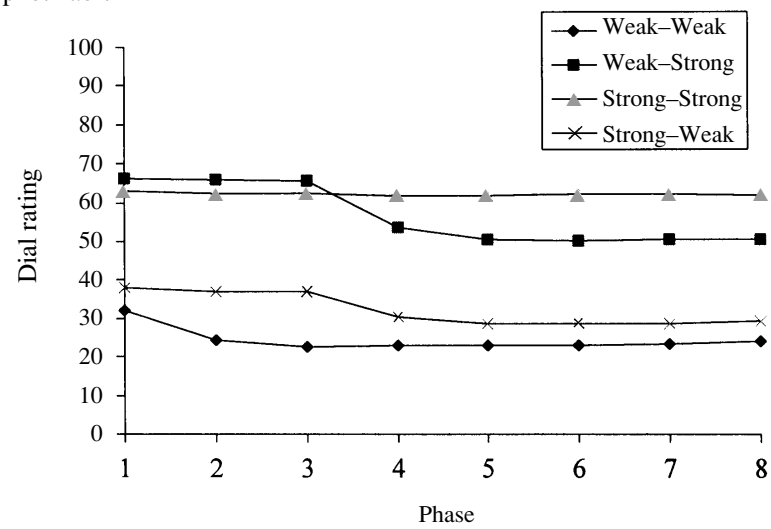


NB: For stimulus rating: 1 = '*not at all*'; 10 = '*as normally as possible*'.

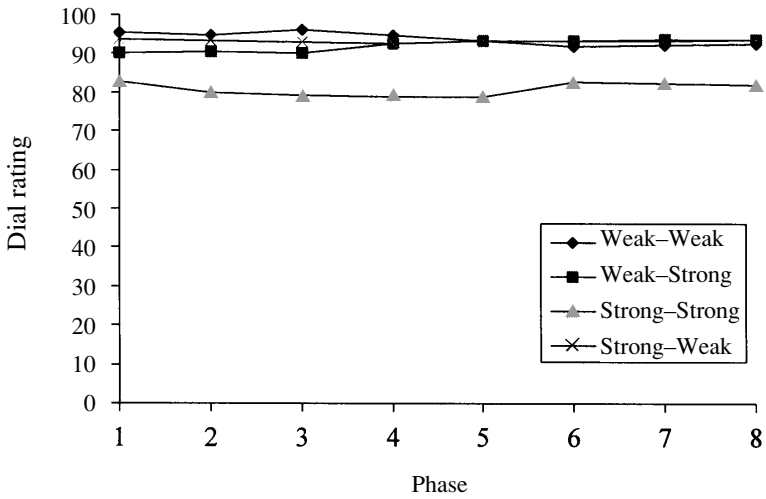
Figure 1. Stimulus ratings on Test 1 and Test 2.

The stimulus ratings on Test 1 and Test 2 were not related to belief ratings for either 'Highs' or 'Lows'. The dial ratings across each of the eight phases were not related to success or belief ratings for either 'Highs' or 'Lows'. Finally, ratings of success and belief were related for both 'Highs' ($r = 0.44$, $p<0.05$) and 'Lows' ($r = 0.77$, $p<0.001$).

High hypnotizable



Low hypnotizable



NB: For dial ratings: 0 = '*no feeling in palm*'; 100 = '*palm feeling as normal as possible*'. The eight phases represent the period of time from just before Test 1 to just after Test 2. Phase 4 incorporates Test 1; phase 6 incorporates Test 2.

Figure 2. Dial ratings across eight phases.

Discussion

Hypnotized subjects develop a transient belief that the state of affairs is as suggested by the hypnotist rather than as communicated by external reality (Orne, 1959; Sutcliffe, 1961) and the subject achieves this shift in phenomenology through both the cognitive and the social events associated with hypnosis. As McConkey (1991) noted, the interaction of cognitive and social processes encourages a context of credibility in

Table 1. Retrospective ratings of success and belief

Hypnotizability and stimuli	Rating (SD)	
	Success	Belief
High-hypnotizable		
weak–weak	6.13 (1.64)	6.50 (2.45)
weak–strong	6.25 (2.19)	6.38 (2.62)
strong–strong	4.50 (1.77)	6.63 (1.41)
strong–weak	4.88 (2.30)	6.31 (2.79)
Low-hypnotizable		
weak–weak	3.75 (2.55)	4.75 (3.33)
weak–strong	2.86 (1.89)	2.75 (1.91)
strong–strong	5.00 (0.93)	5.38 (1.60)
strong–weak	4.06 (2.46)	4.56 (3.16)

NB. For success: 1 = *'Not at all successful'*; 10 = *'Extremely successful'*. For belief: 1 = *'Did not believe at all'*; 10 = *'Believed completely'*. SD = standard deviation.

which subjects accept as genuine the events suggested by the hypnotist and experienced by themselves. That was the case in the present experiment for high-, rather than low-hypnotizable subjects who displayed an experience of hypnotic anaesthesia through their verbal ratings of stimulus effect, dial ratings of degree of anaesthesia, and retrospective verbal ratings of success of and belief in anaesthesia. Accordingly, our comments here are focused on high-hypnotizable subjects, and comment on low-hypnotizable subjects only in specific instances.

In terms of the effect of the external event, the stimulus ratings of high- (and also low-) hypnotizable subjects indicated that they acknowledged a change in the strength of the aesthesiometer that was being used across the two tests. When the strength of the aesthesiometer increased, subjects' ratings indicated that they felt it more, and when the strength decreased, their ratings indicated that they felt it less. The acknowledgment of this shift in external reality, however, was not reflected in a corresponding shift in the internal experience of anaesthesia for high-hypnotizable subjects. That is, the dial ratings did not show similar changes in the degree of anaesthesia. Taken together, these findings indicate that hypnotized subjects can simultaneously be aware of shifts in objective reality and not allow that to influence their experience of a counter-factual suggested experience. This is consistent with previous findings that hypnotized individuals can experience suggested anaesthesia in a compelling way and can sustain that experience when tested by aesthesiometers or other objects (e.g. Wilton and McConkey, 1994; Wilton et al., 1997). Also, it is consistent with similar findings from investigations of other phenomena that involve the suggested loss of sensory awareness, such as hypnotic blindness (e.g. Bryant and McConkey, 1989a, 1989b, 1990).

In addition to the implications for theoretical and methodological issues, these findings have implications for clinical applications of hypnosis, particularly in the management of pain. For instance, the finding that high-hypnotizable subjects can maintain their hypnotically suggested, internally generated anaesthetic experience in the face of externally generated, conflicting information suggests that certain patients could maintain the effects of clinical hypnotic suggestion for pain reduction away from the clinical setting, even when faced with adverse stimuli. This is an important issue for further research, especially given that Barber (1998) asserted that the

mechanism by which some individuals can experience persistent pain relief in response to hypnotic analgesia is unknown and relatively unresearched. One way to conceptualize clinical success of hypnotic analgesia is in terms of the relationship between internal experience and external reality as highlighted in the present findings. Specifically, it may be useful to compare the relative strengths of the suggested analgesic experience (within the clinical setting) and adverse stimuli that the client is likely to confront outside the clinical setting, which may conflict with their analgesia experience and thus their ability to manage pain. Of course, when considering the effect of externally generated, conflicting information it is problematic to equate essentially innocuous stimuli (such as placing an object in the hand or touching the palm with an aesthesiometer) with adverse stressors associated with the demands of daily life. Nevertheless, conceptualizing the effect of clinical suggestions in this way may provide an understanding of the persistence of analgesia effects inside and outside the clinical setting.

The pattern of convergence and divergence among our indices of the effect of the external stimulus and the nature of the internal experience suggests that researchers need to consider more carefully the precise data they collect from subjects and the inferences they draw from those data. In the present experiment, for instance, a focus solely on the stimulus ratings could lead to an inference that subjects were not experiencing anaesthesia as much when the aesthesiometer was stronger than when it was weak; however, a consideration of both the stimulus ratings and the dial ratings indicates that subjects were both acknowledging external reality while maintaining their internal experience of anaesthesia. In other words, the multiple conflicting demands of the communications of the hypnotist and the setting had to be resolved, and subjects worked to resolve those demands without compromising the phenomenal genuineness of hypnotic anaesthesia.

This interpretation is complicated by the finding that the retrospective ratings of success showed that 'Highs' who were given the weak rather than the strong stimulus on the first test gave higher ratings of success. This finding suggests that the experiential interface of external and internal events can influence subjects' retrospective assessment of their experience of a suggested effect; notably, however, this pattern was not seen for ratings of belief. The way in which subjects' determine their success of and belief in an hypnotic event is a critical feature in both theoretical and methodological terms (McConkey, 1991). Theoretically, for instance, although investigators have speculated about processes such as delusion (Sutcliffe, 1961), self-deception (Sarbin, 1981), misattribution (Spanos, 1986), compliance (Wagstaff, 1981) and dissociation (Kihlstrom, 1987), the criteria that subjects use to determine whether their subjective experience or behavioural performance is consistent with a hypnotically suggested effect is not clear (Lynn et al., 1990; McConkey, 1991). Methodologically, as Wagstaff (1997) pointed out, the use of procedures such as the Experiential Analysis Technique (Sheehan and McConkey, 1982) is one way to explore more fully the experiences and interpretations of the hypnotized individual. The dial method is another way. It is interesting to note, however, that in the present experiment subjects' retrospective ratings of belief were not related to either their stimulus ratings or their dial ratings. Thus, it is unclear on what basis subjects made judgements about belief; understanding the factors that shape belief in the hypnotic setting is a continuing important focus for research.

The dial method was used in the present experiment to provide a concurrent, continuous assessment of the experience of anaesthesia. Overall, it indicated that for high-hypnotizable subjects the degree of suggested anaesthesia typically increased during the suggestion, decreased across the tests, and decreased more during the can-

cellation. This pattern is consistent with McConkey et al. (1999) who reported that the strength of the hypnotic item typically increased as the suggestion was being given (albeit differently across different levels of hypnotizability and different types of items), levelled off during any test period, and decreased as the effect was being cancelled (although not necessarily for all subjects and not as rapidly as might be expected). Notably, although the dial ratings and the stimulus ratings were related across the tests, the dial ratings across the tests were not related to the retrospective ratings of success or belief. It is somewhat surprising that there was no relationship between the dial ratings and the retrospective ratings in the present experiment, and this underscores how a focus on particular measures will lead sometimes to convergent and sometimes divergent interpretations of the behaviour and experience of the hypnotized individual.

The dial ratings focused on the degree of anaesthesia at the time that subjects were experiencing it, and the success and belief ratings asked subjects to look back and subjectively average, as it were, their overall experience. We acknowledge that how subjects interpreted the request for dial ratings of the degree of anaesthesia is not clear. We also recognize that the dial method places an attentional and physical load on subjects, and that the instructions for using the dial were given during the hypnotic experience. Although post-experimental comments indicated that subjects were able to undertake the use of the dial with relative care, were interpreting the dial rating as an indication of the phenomenal genuineness of anaesthesia, and neither the instructions nor the use of the dial appeared to disrupt their hypnotic experience, further investigation of these methodological aspects of the dial measure is necessary (see also McConkey et al., 1997; McConkey et al., 1999). Further, whereas our use of the dial method focused on the degree of anaesthesia, it is useful to note that this could be used for any dimension for which it would be helpful to collect concurrent information to index shifts in the experience of the hypnotized individual across the establishment, test and cessation of an hypnotic experience. In doing so, however, it would be important to ensure that subjects' understanding of the dimension of interest was consistent across subjects and across test conditions, as well as consistent with the investigator's intended dimension; of course, this is the case for any verbal report or behavioural reaction in the experimental setting.

Finally, both the experiencing and the testing of hypnotic items can be said to involve the creation of a confrontation between real, external and suggested, internal events. The resolution of that confrontation is at the core of much debate about hypnosis. For instance, Orne (1959) considered that when faced with such conflict during hypnosis, hypnotized individuals typically resolve the conflict in a way that ignores logic. Although empirical findings of such resolution of conflict are not necessarily consistent with that original notion (e.g. McConkey, 1983; McConkey et al., 1991), they do show that there is a complexity in response to conflict that is not accommodated easily by theoretical frameworks that do not recognize that subjects approach, interpret, display and attribute hypnotic phenomena in a variety of ways. The present experiment underscores that complexity and indicates that hypnotized individuals can keep separate, as it were, their assessment of real and suggested events.

Acknowledgements

This research was supported in part by a grant from the Australian Research Council to Kevin M. McConkey and by an Australian Postgraduate Award to Amanda J. Barnier. We are grateful to Fiona Maccallum and Heather Wilton for research assistance.

References

Arons H. Hypnosis in Criminal Investigation. Springfield, IL: Charles C Thomas, 1967.

Barber J. The mysterious persistence of hypnotic analgesia. International Journal of Clinical and Experimental Hypnosis 1998; 46: 28–43.

Barnier AJ, McConkey KM, Wilton HJ. Anaesthesia and the circle-touch test: Exploring phenomena and method in hypnosis. Contemporary Hypnosis 1997; 14: 22–25.

Bryant RA, McConkey KM. Hypnotic blindness: A behavioral and experiential analysis. Journal of Abnormal Psychology 1989a; 98: 71–77.

Bryant RA, McConkey KM. Hypnotic blindness, awareness and attribution. Journal of Abnormal Psychology 1989b; 98: 443–447.

Bryant RA, McConkey KM. Hypnotic blindness and the relevance of cognitive style. Journal of Personality and Social Psychology 1990; 59: 756–761.

Cheek DB. Use of rebellion against coercion as a mechanism for hypnotic trance deepening. International Journal of Clinical and Experimental Hypnosis 1959; 7: 223–227.

Crasilneck HB. The use of the Crasilneck Bombardment Technique in problems of intractable organic pain. American Journal of Clinical Hypnosis 1995; 37: 255–266.

Eiblmayr K. Trance logic and the circle-touch test. Australian Journal of Clinical and Experimental Hypnosis 1987; 15: 133–145.

Enqvist B, von Konow L, Bystedt H. Stress reduction, preoperative hypnosis and perioperative suggestion in maxillofacial surgery: somatic responses and recovery. Stress Medicine 1995; 11: 229–233.

Erickson JC. The use of hypnosis in anesthesia: a master class commentary. International Journal of Clinical and Experimental Hypnosis 1994; 42: 8–12.

Evans FJ, Orne MT. Motivation, performance, and hypnosis. International Journal of Clinical and Experimental Hypnosis 1965; 13: 103–116.

Evans FJ, Orne MT. The disappearing hypnotist: The use of simulating subjects to evaluate how subjects perceive experimental demands. International Journal of Clinical and Experimental Hypnosis 1971; 19: 277–296.

Field PB. Some self-rating measures related to hypnotizability. Perceptual and Motor Skills 1966; 23: 1179–1187.

Garrett JB, Wallace B. A novel test of hypnotic anesthesia. International Journal of Clinical and Experimental Hypnosis 1975; 23: 139–147.

Hilgard ER. Divided Consciousness in Hypnosis: Multiple controls in human thought and action. New York: Wiley, 1977.

Hilgard ER, Hilgard JR. Hypnosis in the Relief of Pain. Los Altos, CA: William Kaufmann, 1983.

Hilgard ER, Hilgard JR, Macdonald H, Morgan AH, Johnson LS. Covert pain in hypnotic analgesia: Its reality as tested by the real–simulator design. Journal of Abnormal Psychology 1978; 87: 239–246.

Kihlstrom JR. The cognitive unconscious. Science 1987; 237: 1445–1452.

Lynn SJ, Rhue JW, Weekes JR. Hypnotic involuntariness: A social cognitive analysis. Psychological Review 1990; 97: 169–184.

McGlashan TH, Evans FJ, Orne MT. The nature of hypnotic analgesia and placebo response to experimental pain. Psychosomatic Medicine 1969; 31: 227–246.

McConkey KM.The impact of conflicting communications on response to hypnotic suggestion. Journal of Abnormal Psychology 1983; 92: 351–358.

McConkey KM. The construction of hypnotic experience: The relevance of belief. Australian Journal of Clinical and Experimental Hypnosis 1990; 18: 1–7.

McConkey KM. The construction and resolution of experience and behavior in hypnosis. In: Lynn SJ, Rhue JW (eds), Theories of Hypnosis: Current models and perspectives. New York: Guilford, 1991; 542–563.

McConkey KM, Bryant RA, Bibb BC, Kihlstrom JF. Trance logic in hypnosis and imagination. Journal of Abnormal Psychology 1991; 100: 464–472.

McConkey KM, Bryant RA, Bibb BC, Kihlstrom JF, Tataryn DJ. Hypnotically suggested anaesthesia and the circle-touch test: A real–simulating comparison. British Journal of

Experimental and Clinical Hypnosis 1990; 7: 153–157.
McConkey KM, Glisky ML, Kihlstrom JF. Individual differences among hypnotic virtuosos: A case comparison. Australian Journal of Clinical and Experimental Hypnosis 1989; 17: 131–140.
McConkey KM, Szeps A, Barnier AJ. Hypnotic Sex Change: Indexing the subjective experience of a transient delusion. Manuscript submitted for publication.
McConkey KM, Wende V, Barnier AJ. Measuring change in the subjective experience of hypnosis. International Journal of Clinical and Experimental Hypnosis 1999; 47: 23–39.
Miller ME, Bowers KS. Hypnotic analgesia and stress inoculation in the reduction of pain. Journal of Abnormal Psychology 1986; 95: 6–14.
Orne MT. The nature of hypnosis: Artifact and essence. Journal of Abnormal and Social Psychology 1959; 58: 277–299.
Orne MT, Evans FJ. Inadvertent termination of hypnosis with hypnotized and simulating subjects. International Journal of Clinical and Experimental Hypnosis 1966; 14: 61–78.
Orne MT, Dinges DF, Orne EC. On the differential diagnosis of multiple personality disorder in the forensic context. International Journal of Clinical and Experimental Hypnosis 1984; 32: 118–169.
Sarbin TR. On self-deception. Annals of the New York Academy of Sciences 1981; 364: 220–235.
Sheehan PW, McConkey KM. Hypnosis and Experience: The exploration of phenomena and process. Hillsdale, NJ: Erlbaum 1982.
Shor RE, Orne EC. Harvard Group Scale of Hypnotic Susceptibility, Form A. Palo Alto, CA: Consulting Psychologists Press, 1962.
Spanos NP. Hypnotic behavior: A social-psychological interpretation of amnesia, analgesia and 'trance logic'. Behavioral and Brain Sciences 1986; 9: 449–502.
Spanos NP, Katsanis J. Effects of instructional set on attributions of nonvolition during hypnotic and nonhypnotic analgesia. Journal of Personality and Social Psychology 1989; 56: 182–188.
Sutcliffe JP. 'Credulous' and 'skeptical' views of hypnotic phenomena: Experiments on esthesia, hallucination, and delusion. Journal of Abnormal and Social Psychology 1961; 62: 189–200.
Tripp EG, Marks D. Hypnosis, relaxation and analgesia suggestion for the reduction of reported pain in high- and low-suggestible subjects. Australian Journal of Clinical and Experimental Hypnosis 1986; 14: 99–113.
Wagstaff GF. Hypnosis, Compliance and Belief. New York: St Martin's Press, 1981.
Wagstaff GF. The circle-touch test: Trance-logic, dissociation, or demand characteristics? Contemporary Hypnosis 1997; 14: 16–21.
Wallace B, Hoyenga KB. Production of proprioceptive errors with induced hypnotic anesthesia. International Journal of Clinical and Experimental Hypnosis 1980; 28: 140–147.
Wallace B, Hoyenga KB. Performance of fine motor coordination activities with a hypnotically anesthetized limb. International Journal of Clinical and Experimental Hypnosis 1981; 29: 54–65.
Weitzenhoffer AM, Hilgard ER. Stanford Hypnotic Susceptibility Scale, Form C. Palo Alto, CA: Consulting Psychologists Press, 1962.
Wilton HJ, McConkey KM. Hypnotic anaesthesia and the resolution of conflict. Contemporary Hypnosis 1994; 11: 1–8.
Wilton HJ, Barnier AJ, McConkey KM. Hypnotic anaesthesia and the circle-touch test: Investigating the components of the instructions. Contemporary Hypnosis 1997; 14: 9–15.

Address for correspondence:
Professor K.M. McConkey,
School of Psychology,
University of New South Wales,
Sydney 2052,
Australia
E-mail: k.mcconkey@unsw.edu.au

Received 10 October 1997; revised version accepted 15 February 1999