

A COMPONENTIAL APPROACH TO HYPNOTIC MEMORY FACILITATION: FOCUSED MEDITATION, CONTEXT REINSTATEMENT AND EYE MOVEMENTS

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Abstract

Although hypnosis is now less popular as an interviewing technique in forensic investigations than it used to be, recent evidence suggests that some of the components of hypnotic interviewing might still be useful in the development of brief memory facilitation procedures. Two experiments are described which continue this componential approach to hypnotic interviewing. In the first experiment, the effects on episodic memory of a brief context reinstatement (revivication) procedure were examined together with a focused breathing meditation technique which shares similarities with traditional hypnotic induction. A second experiment investigated the effects of horizontal eye movements which some have also associated with hypnotic responding. Results indicated that a combined context reinstatement and focused meditation procedure was more effective than context reinstatement alone in facilitating memory for an emotional event without the increase in false positive errors familiar to more traditional hypnosis techniques. In contrast, an instruction to perform horizontal eye movements was not effective in facilitating memory and, when combined with a suggestion for improved recall, produced higher confidence in incorrect responses. Implications are discussed. Copyright © 2007 British Society of Experimental & Clinical Hypnosis. Published by John Wiley & Sons, Ltd.

Key words: accuracy, confidence, context reinstatement, EMDR, eye movements, forensic hypnosis, interviewing, meditation, memory facilitation

Introduction

In both the UK and USA, forensic hypnotic interviewing is considerably less popular as an eyewitness memory facilitation technique than it was in the early 1980s, having been displaced largely by the Cognitive Interview (Kebbell and Wagstaff, 1998, 1999a,b; Hammond, Wagstaff and Cole, 2006). The most frequently cited problem is that, under hypnosis, witnesses may erroneously report items that they would normally reject on the basis of uncertainty (see for example, Orne, 1979; Diamond, 1980; Wagstaff, 1982b; 1989, 1999ab; Orne, Soskis, Dinges and Orne, 1984; Laurence and Perry, 1988; Krass, Kinoshita and McConkey, 1989; Perry, Orne, London and Orne, 1996; Scoboria, Mazzini, Kirsch and Milling, 2002). More recently, this problem has been compounded by public concerns over the safety of hypnosis, especially with vulnerable individuals.

At the same time, however, evidence suggests that, for recall of meaningful stimuli, hypnotic interview procedures may sometimes produce more correct recall than no

memory facilitation procedures at all (Geiselman, Fisher, MacKinnon, and Holland, 1985; Erdelyi, 1994; Wagstaff, 1999a, 1999b). This is not surprising, as many components of traditional hypnotic interviewing have subsequently been shown to enhance memory in their own right. For example, although the Cognitive Interview has been presented as an alternative to 'hypnosis', it draws upon a number of procedures and devices previously utilized by hypno-investigators: these include the use of sympathetic non-authoritarian interrogators who establish trust and rapport; repeated testing; focused retrieval; techniques to provide memory retrieval cues, such as recalling in different orders; changing perspectives; and context reinstatement (see for example, Hibbard and Worring, 1981; Geiselman et al., 1985; Geiselman, Fisher, MacKinnon and Holland, 1986; Fisher and Geiselman, 1992; Memon, Wark, Bull and Koehnken, 1997; Kebbell and Wagstaff, 1998, 1999; Wagstaff, 1999a, 1999b). Indeed, one of first versions of the Cognitive Interview was developed specifically from work on hypnosis (Wagstaff, 1982a).

Unlike hypnosis, however, a considerable amount of evidence indicates that, if used appropriately, the Cognitive Interview does not unduly influence incorrect responses and susceptibility to leading questions, or disrupt confidence accuracy relationships (see, for example, Geiselman et al., 1985, 1986; Fisher, Geiselman, Raymond, Jurkevich, and Warhaftig, 1987; Fisher, Geiselman and Amador, 1989; Memon and Bull, 1991; Memon and Kohnken, 1992; Bekerian and Dennett, 1993; Boon and Noon, 1994; Kebbell and Wagstaff, 1996). Nevertheless, the Cognitive Interview has not been without criticism. In practice it is time consuming not only in terms of time spent interviewing the witnesses but also in training the interviewers; moreover, often officers do not adhere to the specified procedures (Kebbell and Wagstaff, 1999). Additionally, if it is used inappropriately or by inadequately trained interviewers, the Cognitive Interview is also capable of producing an unacceptable number of false positive errors (Memon, Wark, Holley, Bull and Koehnken, 1997).

Consequently, Wagstaff, Brunas-Wagstaff, Cole, and Wheatcroft (2004a) and Wagstaff, Brunas-Wagstaff, Knapton, Winterbottom, Crean, Cole and Wheatcroft (2004b) have suggested there may be merit in re-examining components of hypnotic interviewing that may be useful in their own right, and may not require excessive time and training to administer. For example, similarities between the effects produced by standard hypnotic induction procedures and other procedures such as systematic relaxation, autogenic training and meditation have often been commented upon (see, for example, Barber, Spanos and Chaves, 1974; Benson and Klipper, 1976; Edmonston, 1977, 1991; Morse, Martin, Furst and Dubin, 1977). According to Benson and Klipper (1976), these procedures share in common the adoption of a relaxed, passive mode of thinking, brought about by the focusing of attention on some neutral target or set of targets such as parts of the body or breathing, while ignoring distracting thoughts. According to Wagstaff et al. (2004ab) it is possible that such procedures might facilitate memory for certain kinds of material. For example, instructions that invite participants to focus attention away from external sources onto bodily experiences, may encourage a more 'holistic' or 'global' mode of information processing (Gur and Gur, 1974; Wagstaff, 1998) along with decrease in left frontal processing and an increase in non-executive right hemisphere processing (Gruzelier, 1988; Gruzelier and Warren, 1993; McCormack and Gruzelier, 1993). A variety of evidence suggests that these factors may facilitate memory for faces and memory for meaningful emotional material (Sergent, 1985; Tanaka and Farah, 1993; Ali and Cimino, 1997; Kim, Andreasen, O'Leary, Wiser, Ponto, Watkins and Hichwa, 1999; Macrae and Lewis, 2002; Nagae and Moscovitch, 2002). At the same time, these

factors would be likely to interfere with left frontal executive tasks, such as verbal fluency (Gruzelier, 1988; Gruzelier and Warren, 1993; Kallio, Revonsuo, Hamalainen, Markela and Gruzelier, 2001; Wagstaff, 2003).

With these considerations in mind, Wagstaff et al. (2004a, b) investigated the effects on memory of what they termed a 'Focused Meditation' procedure (FM), which shares features of hypnotic induction but without the contextual label of 'hypnosis'; i.e. without a feature that might engender the expectancies that could lead to false alarms and false confidence effects typically associated with hypnosis. Their results showed that a very brief FM procedure facilitated free recall of an emotional event (Princess Diana's funeral), without the characteristic false errors and inflated confidence levels associated with traditional hypnotic techniques. As predicted, FM also inhibited performance on a verbal fluency task.

However, if the FM procedure is to be advanced as a viable tool for facilitating eyewitness memory it is important to see how it performs when compared to other brief memory facilitation procedures. To this end, Hammond et al. (2006) compared the efficacy of FM relative to that of context reinstatement. With context reinstatement, participants are asked to describe in detail the context surrounding the critical event, including their thoughts and feelings at the time. Although now seen as a routine part of cognitive interviewing, context reinstatement has traditionally been a fundamental feature of the 'revivication' technique in hypnotic forensic interviewing (Hibbard and Worring, 1981), and can be effective by itself (Smith, 1979; Malpass and Devine, 1981; Krafka and Penrod, 1985; Cutler, Penrod and Martens, 1987). In their study, Hammond et al. (2006) found that, for both adults and children, FM and context reinstatement procedures enhanced performance on both open-ended and closed questions to levels above those achieved by controls. However, although those in the context reinstatement condition also produced significantly more correct responses than those in the FM condition, they also displayed elevated levels of confidence in relation to incorrect responses on closed questions (FM did not have this effect).

Given these results, the next obvious comparison to make is one between the effects of context reinstatement alone and those of a combined context reinstatement and FM procedure, i.e. to examine whether context reinstatement is made even more effective by the addition of FM. This was the aim of the following experiment.

Experiment 1

Ready, Bothwell, and Brigham (1997) found that a procedure that combined hypnotic induction and context reinstatement was more effective in facilitating face recognition than hypnotic induction or context reinstatement alone. If FM and hypnotic induction share similar characteristics, it could be that FM will also complement context reinstatement in other memory domains. However, whereas FM appears to facilitate memory without producing an increase in the number of errors or confabulated details, context reinstatement seems less reliable in this respect (Wagstaff et al., 2004a, b; Hammond et al., 2006). It remains to be seen, therefore, which of these trends dominates when the two are combined.

Method

Participants

The participants were 20 female and 10 male members of the general public from various educational backgrounds and occupations. The age range was 19–56 years ($M = 32.33$;

$SD = 11.34$). Participants were included only if they had seen the entire live televised coverage of Princess Diana's funeral in 1997, and had not viewed it since.

Materials and procedure

All participants were invited to take part in psychological memory experiment which centred on Princess Diana's funeral in 1997. Participants were assigned randomly to one of three group conditions: Control, Context Reinstatement Alone, and Meditation plus Context Reinstatement, 10 in each. There were 4 males and 6 females in each of the former groups, and 2 males and 8 females in the latter. The mean ages were 36.50 ($SD = 11.40$), 30.80 ($SD = 11.75$), and 29.70 ($SD = 10.79$), for the three groups, respectively.

As in previous studies employing FM, participants in the Meditation plus Context Reinstatement condition were first given a focused breathing meditation exercise which lasted 90 seconds (for details see Wagstaff et al., 2004b). Participants were instructed to continue these focused breathing exercises as they undertook the memory task. Following this, a brief context reinstatement procedure was read out slowly to each participant by the experimenter (see Appendix 1). Participants were then required to answer a questionnaire about the funeral. This included three open-ended questions, 'describe the funeral procession', 'describe the church where the funeral took place', and 'describe the scene as the coffin was taken through the church'. These were followed by six 'closed' questions requiring specific details; for example, 'what type of flowers were on the coffin?' and 'what did the crowd do as the coffin was driven away?' Participants were asked to rate their confidence in the accuracy of the answers to each question on a 5-point scale, where 1 indicated a 'pure guess' and 5 indicated 'sure'. Participants were also informed that they could leave the experiment at any time.

For the Context Reinstatement Alone condition, the procedure was exactly the same as that for the Meditation plus Context Reinstatement condition, except that there was no focused breathing exercise beforehand. Those in the Control condition simply received the questionnaire.

Results and discussion

A one-way ANOVA on the number of correct responses for the open-ended questions showed a significant main effect for the three conditions, $F(2,27) = 8.30$, $p < 0.003$. Post hoc Tukey tests ($p < 0.05$) showed that the Meditation plus Context Reinstatement group scored significantly more correct responses ($M = 11.70$, $SD = 5.31$) than both the Context Reinstatement Alone group ($M = 6.40$, $SD = 2.50$) and the control group ($M = 5.40$, $SD = 2.63$), which did not differ significantly. Incorrect responses to the open-ended questions were negligible in all conditions.

A significant main effect for the three conditions was also found for the closed questions, $F(2,27) = 4.25$, $p < 0.03$. Post Hoc Tukey tests ($p < 0.05$) showed that the Meditation plus Context Reinstatement condition ($M = 3.90$, $SD = 1.60$) gave significantly more correct responses than the Context Reinstatement Alone condition ($M = 2.40$, $SD = 0.84$) and the Control condition ($M = 2.40$, $SD = 1.43$); the latter did not differ significantly from each other.

One-way ANOVAs on the confidence data showed no significant differences between the groups in terms of confidence in correct answers to the open-ended or closed questions, or confidence in incorrect answers to the closed questions; i.e. there was no evidence that either Meditation plus Context Reinstatement or Context Reinstatement Alone inflated levels of confidence to both correct and incorrect answers.

Further analyses showed that none of the above effects was influenced significantly by adding age and sex as covariates and conducting a series of ANCOVAs. However, although not affecting the significance of the overall effect for groups, there was a trend for males ($M = 9.00$, $SD = 5.54$) to score higher than females ($M = 7.25$, $SD = 4.01$) on correct responses to open questions, $F(1,25) = 4.81$, $p < 0.04$, which, given the smaller proportion of males in the Meditation with Context Reinstatement group, suggests that our results may be a conservative estimate of the efficacy of this procedure.

When considered together with previous studies, these results suggest that an FM procedure can reliably facilitate memory for details of an emotionally salient event, whether presented alone or along with context reinstatement (Wagstaff et al., 2004a, b; Hammond et al., 2006). Moreover, this was accomplished without an increase in false positive responses. Unlike previous studies, however, no memory facilitation effect was found for context reinstatement alone (though there was a slight trend in the predicted direction for open questions), suggesting that brief context reinstatement alone may be somewhat less reliable, at least in facilitating episodic memory.

The possibility that the FM might complement context reinstatement poses interesting questions about the mechanisms involved. For example, a popular explanation for the effects of context reinstatement is that when attention is focused on the production of contextual information this provides associative cues which aid the retrieval of target information. In contrast, as mentioned previously, like hypnotic induction, FM may work on the principle that concentration on the meditation instructions uses up executive processing capacity, with the result that there is less interference from executive processes which may interfere with the recall of more globally processed material (Wagstaff et al., 2004b). But, if this is the case, it is not immediately obvious why context reinstatement should benefit from FM. However, it is possible that both FM and context reinstatement could benefit from a common mechanism. For instance, perhaps the activity of 'thinking around' the target also uses up executive capacity, reducing executive interference in other tasks.

Having investigated FM and context reinstatement, we next turned our attention to another possible brief procedure for facilitating memory that has also been linked to hypnosis, eye movements.

Experiment 2

The idea that there may be links between hypnosis and horizontal eye movements is fairly old (see, for example, Tebecis and Provins, 1975). However, the idea that eye movements may facilitate memory for emotionally salient events has been more recently associated with Eye Movement Desensitization and Reprocessing (EMDR) therapy (Shapiro, 1991, 2001; Stickgold, 2002). Although EMDR was originally developed as a technique for trauma resolution, more recently some have advocated its use as a technique for recovering memories. In this respect, there has been debate not only as to whether EMDR may share similar problems to hypnosis (for example, with regard to the production of pseudomemories), but also as to whether EMDR is itself a form of hypnosis (for example, whether horizontal eye movements can induce a state of hypnosis as in the stereotypic 'swinging pendulum' style of induction). Indeed, in Australia, as a result of the NSW Court of Criminal Appeal's decision in *R v Tillott & Ors* (1995) there are now common procedural guidelines for obtaining evidence from witnesses who have undergone hypnosis or EMDR therapy.

Notwithstanding these issues, there is some experimental evidence that instructing participants to move their eyes horizontally from left to right may facilitate certain forms of memory retrieval. For example, Christman, Garvey, Propper and Phaneuf (2003) found that horizontal saccadic (but not vertical or smooth pursuit) eye movements produced an increase in discriminability between old and new items on a recognition but not fragment completion task. They also found that horizontal saccadic eye movements facilitated autobiographical memory. By way of explanation they suggest that only horizontal eye movements result in the selective activation of the contralateral hemisphere and saccadic eye movements produce greater cortical activation than pursuit eye movements. The simultaneous activation of both hemispheres induced by bilateral horizontal saccades may thus enhance inter-hemispheric interaction, producing the improvement in episodic memory.

If this is the case, however, there would appear to be little if any overlap between the alleged mechanisms underlying memory facilitation through eye movements, and those resulting from FM and hypnosis. However, an alternative explanation might be that rather than directly 'activate' the brain regions responsible for episodic memory, horizontal saccades (more than vertical smooth pursuit movements) may use up, in particular, some of the left frontal executive processing capacity that might otherwise interfere with (or distract from) more automatic retrieval processes. If this is the case, then there may indeed be an overlap between some of the effects of FM and horizontal eye movements and standard relaxation hypnotic induction procedure.

However, although there are reasons to propose a simple horizontal eye movement procedure could potentially be useful as a brief memory facilitation procedure, as yet, there have been no experimental investigations looking at how its efficacy may be affected by expectations. For example, do horizontal eye movements lead to increased reporting errors, or will this only happen if the procedure is accompanied by a suggestion that it will improve memory? These issues were the focus of this experiment.

Method

Participants

The participants were 18 male and 27 female members of the general public from various educational backgrounds and occupations. The age range was 21–59 yrs ($M = 27.00$; $SD = 10.39$). Again, participants were included only if they had seen the entire live televised coverage of Princess Diana's funeral in 1997, and had not viewed it since.

Materials and procedure

Participants were then assigned randomly three conditions: Eye Movement Alone, Eye Movement with Suggestion, and Control; 15 in each. There were 7 males and 8 females, 5 males and 10 females, and 6 males and 9 females, in the three groups respectively. The mean ages were 26.27 ($SD = 9.72$), 29.27 ($SD = 12.57$), and 26.13 ($SD = 9.00$), for the three groups, respectively. As in Experiment 1, all participants were informed that they were taking part in a psychological memory experiment based on Princess Diana's funeral in 1997 and that they could leave the experiment at any point.

In the Eye Movement Alone condition, in common with EMDR practice, participants were instructed to track the motion of the first two fingers of the experimenter's hand with their eyes alone, whilst their head remained still. The experimenter then moved her first two fingers back and forth in a horizontal plane across the line of vision from left to right, approximately 30 to 40 centimetres away from the participant's face. Each sweep covered the extreme left and right of the field of vision, which is around 30 centimetres.

This was done at the rate of two back and forth movements each second, for 30 seconds, at which point participants were asked to complete a questionnaire regarding their memory for Princess Diana's funeral. The first four questions in the questionnaire were open ended, requiring participants to describe in as much detail as they could, 'the funeral procession', and 'the church in which the funeral took place'. They were also asked to name 'as many famous guests' as they could remember that attended the funeral and were asked 'which royals walked behind the coffin as it was taken into the church'. These were followed by a further 11 closed questions; for example, 'what type of flowers were on top of the coffin?' and 'what did the crowd do following Earl Spencer's speech?' As in Experiment 1, after each questions, participants were also asked to rate their confidence in the accuracy of the answers on a 5-point scale.

In the Eye Movement with Suggestion condition participants were treated identically to those in the Eye Movement Alone, except that before the eye movement task, participants were told that left to right eye movements can act 'as a useful memory enhancer for events such as Princess Diana's funeral'. In the Control condition, participants' only task was to complete the questionnaire. There was no mention of bilateral eye movement.

Results and discussion

One-way ANOVAs on a number of correct responses for the open-ended and closed questions showed no significant main effect for the three conditions; $F(2,44) = 0.06$, $p > 0.94$, and $F(2,44) = 0.03$, $p > 0.97$, for the open and closed questions respectively. Incorrect responses to the open ended questions were again negligible in all conditions.

However, a one-way ANOVA on the mean confidence data for correct answers to closed questions showed a significant difference between the groups, $F(2,44) = 3.60$, $p < 0.04$. Post-hoc Tukey tests ($p < 0.05$) showed that those in the Eye Movement with Suggestion condition ($M = 2.80$, $SD = 0.38$) showed more confidence in correct responses than those in the Control condition ($M = 2.40$, $SD = 0.47$). Neither of the comparisons involving the Eye Movement Alone condition ($M = 2.60$, $SD = 0.36$) was significant.

A one-way ANOVA on the mean confidence data for incorrect answers to closed questions also showed a significant difference between the groups, $F(2,44) = 7.52$, $p < 0.003$. Post hoc Tukey tests ($p < 0.05$) showed that those in the Eye Movement with Suggestion condition ($M = 1.86$, $SD = 0.21$) showed more confidence in incorrect responses than those in the Control condition ($M = 1.40$, $SD = 0.41$). Again, neither of the comparisons involving the Eye movement Alone condition ($M = 1.67$, $SD = 0.32$) was significant. Further ANCOVA analyses showed that none of the above effects was influenced significantly by adding age and sex as covariates.

These results suggest that the simple horizontal eye movement procedure used here was ineffective as a procedure for facilitating memory for an emotional event, though when combined with an efficacy suggestion it appeared to inflate confidence in both correct and incorrect responses. Having said this, there are two features of the eye movement procedure used here that might have prevented a more positive result. First, it was short in duration, and might have been more effective had it continued, at least intermittently, whilst participants were actually answering the questionnaire. Second, although the procedure adopted for inducing eye movement is common to EMDR practice, the predictable stimulus movements might have precluded the arousing saccadic activity described by Christman et al. (2003). However, if these factors are requirements for the successful use of this procedure, they may present practical problems in the field. For

example, this technique may require the provision of some kind of apparatus for stimulating saccadic eye movements during interviews; moreover, a problem we found in pilot studies was that (unlike FM and context reinstatement) participants find this task quite fatiguing.

General discussion

As mentioned, when considered together with previous studies, the results of the first experiment suggest that an FM procedure can reliably facilitate memory for details of an emotionally salient event whether presented alone or along with context reinstatement (Wagstaff et al., 2004a, b; Hammond et al., 2006). In contrast, the other possible candidates as brief forensic memory facilitation procedures, context reinstatement and horizontal eye movements alone, may be less reliable in facilitating this kind of memory.

Of importance also is the fact that, in the absence of efficacy suggestions, there is as yet no evidence that, by itself, FM produces more incorrect information or inflated confidence in incorrect information. In this respect, FM differs substantially from hypnosis. As noted earlier, the obvious explanation for the difference is that hypnosis creates a much higher expectancy for memory facilitation; thus for example, Wagstaff, Vella and Perfect (1992) found that jurors were more confident in the veracity of testimony if told it was delivered under hypnosis. In the same way, although no effect was found here, it is possible that a brief context reinstatement instruction could engender different expectancies to an FM instruction (Hammond et al., 2006); for instance, by encouraging the participant to generate peripheral contextual detail, context reinstatement could create a false sense of confidence in veracity of the central detail reported. The importance of expectancy is well illustrated in the second experiment which suggests that eye movement procedures may not of themselves result in false positive errors, but will do so if associated with an expectancy for improved memory.

A more detailed exploration of why false confidence effects occur in memory facilitation procedures would clearly be beneficial in devising techniques for limiting them. For example, neuroimaging work indicates that higher confidence in both correct and incorrect responses is associated with activity in the prefrontal cortex, whereas higher confidence in correct responses only is associated with activity in the temporal lobe (Chua, Rand-Giovanetti, Schacter, Albert and Sperling, 2004). Also there is some evidence that anxiety and the presence of others, both of which can disrupt executive processing, may facilitate confidence-accuracy relationships (Nolan and Markham, 1998; Wagstaff, Cole, Wheatcroft, Brunas-Wagstaff, Blackmore and Pilkington, 2006), and that eyewitness testimony that is automatic and undeliberated is more accurate (Dunning and Stern, 1994). All this suggests that, if there are adequate constraints on expectancy, any procedure which prevents the witness from deliberating about what is remembered could potentially guard against the production of false positive errors.

Nevertheless, whatever the case, the present results continue to endorse the view that, notwithstanding the shortcomings of hypnotic forensic interviewing, a componential approach may provide a rich source of ideas that may yet be useful in police forensic investigations, particularly where time and resources are very limited.

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Appendix

The context reinstatement instruction

Now what I would like you to do is to close your eyes and take yourself back in time to the event of Princess Diana's funeral (pause). Think about where you watched the event (pause), what you were doing at the time (pause), who you watched the televised funeral with (pause). Recall any sounds you could hear, any smells you associate with the event (pause), try and recall the setting in which the event occurred (pause). For example, who was there (pause), what were they wearing (pause), what were they saying (pause)? Think about your feelings and reactions to the event (pause). Try and recall as much

about the context in which the event occurred as you can by mentally taking yourself back to that context (pause).

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