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Fantastic Memories

The Relevance of Research into Eyewitness Testimony and False Memories for Reports of Anomalous Experiences

Reports of anomalous experiences are to be found in all known societies, both historically and geographically. If these reports were accurate, they would constitute powerful evidence for the existence of paranormal forces. However, research into the fallibility of human memory suggests that we should be cautious in accepting such reports at face value. Experimental research has shown that eyewitness testimony is unreliable, including eyewitness testimony for anomalous events. The present paper also reviews recent research into susceptibility to false memories and considers the relevance of such work for assessing reports of anomalous events. It is noted that a number of psychological variables that have been shown to correlate with susceptibility to false memories (e.g., hypnotic susceptibility, tendency to dissociate) also correlate with the tendency to report paranormal and related anomalous experiences. Although attempts to show a direct link between tendency to report anomalous experiences and susceptibility to false memories have had only limited success to date, this may reflect the use of inappropriate measures.

I: Introduction

In all cultures throughout the world, there have always been occasional reports of strange, even miraculous, events. Today, such events are often labelled as 'paranormal' to indicate that, if they really did occur as reported, conventional science is incapable of explaining them. Such reports have always aroused intense controversy. Believers in the paranormal see them as proof of the limitations of the scientific worldview, whereas sceptics often dismiss them as being the result of fraud, stupidity or madness. How should a fair-minded, intelligent, rational person respond to such reports?

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In 1748, Hume published *Of Miracles*, an essay that is particularly relevant to this question (Grey, 1994). Hume presented a strong argument that one would never be rationally justified in believing that a miracle had occurred. He defined a miracle as an event that violates a law of nature, a definition that would be taken by many as including paranormal events. It is important to realise that Hume was not claiming to have proved that miracles have never occurred, only that we would never be justified in believing that they have. He proposed the following principle:

No testimony is sufficient to establish a miracle unless that testimony be of such a kind that its falsehood would be more miraculous than the fact which it endeavours to establish.

Although this principle allows for the possibility that the evidence in favour of a miracle might outweigh the evidence against it, in practice, Hume argued, this never happens. Several factors undermine the credibility of miraculous claims, not least of which is the problem of witness reliability. Is it more likely that the person or persons making the claim are deceivers, or else themselves deceived, or that a law of nature has been violated? Whereas the evidence supporting violations of laws of nature is sparse, possibly even non-existent, we are surrounded by evidence that people sometimes lie and sometimes make mistakes.

This article will focus on the reliability of accounts of anomalous events from individuals who are sincere in presenting those accounts. This is not to deny that deliberate hoaxes and fraud are present in the world of the paranormal, but to accept that many — probably most — reports are made in good faith. Even so, sincerity is no guarantee of accuracy. Empirical support for such scepticism comes from both classic experiments on eyewitness testimony and more recent research on the formation of false memories. The evidence will be considered under four headings. (1) Cases where a normal episode is generally agreed to have taken place, but eyewitnesses disagree over details of what happened. (2) Cases where an apparently paranormal episode is generally agreed to have taken place, but eyewitnesses disagree over details of what happened. (3) Cases where there is a doubt as to whether a sincerely remembered normal episode ever took place at all. (4) Cases where a sincerely ‘remembered’ episode can be shown never to have taken place, but is entirely the product of an experimental procedure of one kind or another.

In the light of this survey, and accompanying analysis of the ways in which sincere memories can be inaccurate, the role of unreliable memory as a source of genuinely held belief in paranormal events will be considered. The motivation for this investigation is that sceptics are often challenged to offer a natural explanation for some alleged paranormal event as described by an individual who claims to have witnessed the event firsthand. However, if memory research supports the idea that such an account may not be an accurate reflection of an actual past event, then in the absence of objective evidence that the event really did occur as described, this is a challenge that should not be accepted. It is possible that the ‘event’ is either a distorted account of an episode that did occur or even a false memory with no basis whatsoever in objective reality.

II: Evidence of Unreliable Testimony

1. *Eyewitness testimony (normal events)*

A great deal of research has been directed towards understanding factors affecting the reliability of eyewitness testimony for normal events, particularly in forensic contexts. A full review of this topic is beyond the scope of the current paper (for more detailed consideration, the reader is referred to, e.g., Cohen, 1989; Loftus, 1979). Studies have typically involved assessing the recall of eyewitnesses for staged events, either using live action or video presentation. When we are able to assess witness reports against some form of objective record, it becomes clear that both perception and memory are constructive processes, influenced not only by input from the senses ('bottom-up' influences) but by our own knowledge, belief and expectations about the world ('top-down' influences).

Some of the findings from this body of research are consistent with our everyday intuitions about how memory works. Our memory is less accurate for peripheral details compared to those upon which our attention is focussed. Our memories are poorer for stimuli presented briefly under imperfect viewing conditions compared to extended viewing under ideal conditions. Our memories are most accurate when we are neither under-aroused (e.g., drowsy) nor over-aroused (e.g., frightened).

However, it is worth noting that our intuitions about memory are often wrong. For example, even under perfect viewing conditions, our memories of what we saw may be highly influenced by our view of what we think we must have seen. French and Richards (1993) showed participants an ordinary clock face with Roman numerals under perfect viewing conditions for an extended period. Participants were asked to draw the clock face from memory. They tended to represent the four as 'IV' in line with their general expectations of Roman numerals. In fact, however, the four on clocks and watches is almost always represented as 'IIII'. Most people are quite surprised when this is first pointed out to them, as they reflect upon the literally thousands of occasions they must have looked at clocks and watches without noticing this oddity. Even thousands of exposures to a simple stimulus under perfect viewing conditions may not be enough to lead to accurate recall.

Schema theory provides a useful framework for considering eyewitness testimony. As Cohen (1989, p. 71) points out:

It can account for the fact that many of our experiences are forgotten, or are reconstructed in a way that is incomplete, inaccurate, generalised, or distorted. Schema theory emphasises the role of prior knowledge and past experience, claiming that what we remember is influenced by that which we already know. According to this theory, the knowledge we have stored in memory is organised as a set of schemas, or knowledge structures, which represent the general knowledge about objects, situations, events, or actions that has been acquired from past experience.

Loftus (1979) has drawn attention to the potentially distorting effects on memory of the use of leading questions in post-event interviews. Classic examples from

her research include the fact that, following the viewing of a film of two cars colliding, witnesses give much higher estimates of speed if they are asked how fast they were travelling when they ‘smashed into’ each other than if the word ‘contacted’ is used. Furthermore, witnesses were more likely to report seeing a broken headlight (even though there wasn’t one) if they were asked, ‘Did you see *the* broken headlight?’ as opposed to ‘Did you see *a* broken headlight?’ (emphasis added). There are real concerns that interviews carried out by investigators with very strong motivations to find evidence supporting their beliefs may often unintentionally lead witnesses in similar fashion.

Another potential source of socially encountered misinformation is that of fellow eyewitnesses. Understandably, investigators often have more faith in an eyewitness account if it appears to be supported by an account of the same incident from another eyewitness. However, it is very likely to be the case that witnesses will have discussed the incident amongst themselves before ever being formally interviewed by investigators. In the light of findings from research on conformity, we might expect that witnesses will influence each other’s reports to a greater or lesser extent. Recent experimental work (e.g., Gabbert *et al.*, in press, submitted) has shown that this is indeed the case. In a sense, such research on misinformation effects provides a link between that dealing mainly with naturally arising memory distortions for witnessed events and that dealing primarily with false memories for events that never actually took place at all.

2. *Eyewitness testimony (apparently paranormal events)*

The focus of this section is on the reliability of eyewitness accounts of apparently paranormal events in circumstances where we can be fairly certain that paranormal forces were not at work. In many of the studies reviewed below, we can be absolutely certain of this, as the situations employed were entirely under the control of the investigators concerned.

As long ago as 1887, Davey had experimentally demonstrated the unreliability of eyewitness accounts of séances. Hyman (1985, p. 27) offers the following account:

Davey had been converted to a belief in spiritualistic phenomena by the slate-writing demonstrations of the medium Henry Slade. Subsequently, Davey accidentally discovered that Slade had employed trickery to produce some of the phenomena. Davey practised until he felt he could accomplish all of Slade’s feats by trickery and misdirection. He then conducted his well-rehearsed séance for several groups of sitters, including many who had witnessed and testified to the reality of spiritualistic phenomena. Immediately after each séance, Davey had the sitters write out in detail all that they could remember having happened during his séance. The findings were striking and very disturbing to believers. No one realized that Davey was employing tricks. Sitters consistently omitted crucial details, added others, changed the order of events, and otherwise supplied reports that would make it impossible for any reader to account for what was described by normal means.

Similar findings were reported by Besterman (1932) and, more recently, by Wiseman *et al.* (1995) and Greening (2002).

Such studies do not allow us to distinguish between the possibilities that distortions occurred during the actual perception of the events as opposed to subsequent recall, but the end result is the same. It is likely that both stages of information processing are affected. The actual perception of the séance is likely to be affected by the mental set that is adopted by the observer. A sceptic is likely to adopt a 'problem-solving' approach, intent on trying to figure out how any effects are being achieved. Someone who believes that the effects might be genuinely paranormal is more likely to just sit back and enjoy them, without a critical eye for crucial details.

Such an account is supported by Wiseman and Morris (1995) who compared believers and disbelievers in the paranormal in terms of their accuracy of recall for pre-recorded 'pseudo-psychic demonstrations' — in other words, conjuring tricks, such as bending a key ostensibly using psychic powers. Overall, believers tended to rate the demonstrations as being more 'paranormal' than disbelievers. They also tended to be less accurate in remembering information that was crucial to explaining how the deception had occurred (e.g., the fact that the key disappeared from view was important because a bent key was switched for the original straight key).

Jones and Russell (1980) exposed participants to either a 'successful' demonstration of ESP or a 'failed' demonstration. In the former case, the experimenters used a marked deck of cards to ensure 60 per cent accuracy, whereas performance was at the chance level of 20 per cent in the latter demonstration. Results again showed accurate recall by disbelievers regardless of whether the results supported their belief, but a strong tendency for believers to remember both demonstrations as successful.

Many of the factors associated with poor reliability of eyewitness testimony are commonly (although not universally) associated with ostensibly paranormal events (see, e.g., Loftus, 1979). These include poor viewing conditions (e.g., darkness or semi-darkness), altered states of consciousness (e.g., due to tiredness, biological trauma, engaging in particular rituals or drug abuse), emotional arousal, and either the ambiguous and unexpected nature of the event on the one hand (in spontaneous cases) or a high level of expectation and will to believe on the other (e.g., in a séance). It should not be surprising, therefore, that the often schema-driven accounts given by eyewitnesses to ostensibly paranormal events are typically distorted versions of the actual events in question. French (1992; 2001a) discusses further the role of beliefs and expectations in perception and interpretation of anomalous experiences.

3. Questionable normal memories

Loftus (1993) presents evidence showing that autobiographical memories for entire episodes can often be open to doubt, even in the absence of any deliberate attempt by others to implant such memories. For example, she describes a study by Pynoos and Nader (1989) in which the investigators had assessed children's memories for a sniper attack on an elementary school playground. Interestingly,

children who had not, in fact, been present during the attack provided apparently sincere first-hand accounts of the event, presumably based upon accounts provided by actual witnesses:

One girl initially said that she was at the school gate nearest the sniper when the shooting began. In truth she was not only out of the line of fire, she was half a block away. A boy who had been away on vacation said that he had been on his way to the school, had seen someone lying on the ground, had heard the shots, and then turned back. In actuality, a police barricade prevented anyone from approaching the block around the school. (Pynoos & Nader, 1989, p. 238)

Another relevant example is provided by so-called 'flashbulb memories' (Brown & Kulik, 1977). It was once believed that certain highly emotional events could lead to memories that were highly vivid and accurate. Classic examples include people's highly confident reports of where they were, whom they were with and what they were doing when they learned of some dramatic news story, such the assassination of John F. Kennedy. Subsequent research in which participants were questioned soon after such dramatic events, and then again after a long delay, has shown that even flashbulb memories can often be inaccurate, no matter how confidently they are described (see, e.g., Neisser & Harsch, 1993, pp. 9–31, for a study of flashbulb memories of the Challenger disaster).

Loftus (1993) provides numerous other examples of situations where confidently held autobiographical 'memories' appear to be based upon no event that the claimant ever actually witnessed first-hand. Such examples should lead us all to be somewhat less confident concerning the accuracy of our autobiographical memories, no matter how clear and vivid they may appear to be. There are very few real-life contexts in which we are forced to question the accuracy of apparent memories, either our own or those of others. But it appears likely that many such memories, whether for natural or paranormal events, could be false memories even without any deliberate attempt by others to implant such a false memory.

4. Implanted false memories

Although psychologists have long recognised that eyewitness accounts of witnessed events were unreliable, it is only within the last decade or so that much research has been directed at the possibility that people may sometimes have rich and detailed memories for events that they have never actually witnessed at all. The main reason for this explosion of research into false memories was the sudden increase in cases of alleged recovered memories of childhood sexual abuse, especially in the USA (see, e.g., Lindsay & Read, 1995; Loftus, 1993; Loftus & Ketchum, 1994; Ofshe & Watters, 1994). Worryingly, surveys of some professionals who were using such techniques as hypnotic regression in attempts to recover memories of abuse revealed a very poor understanding of the relationship between hypnosis and memory. In Yapko's (1994, p. 163) words:

Survey data regarding hypnosis and suggestibility indicate that while psychotherapists largely view hypnosis favourably, they often do so on the basis of misinformation. A significant number of psychotherapists erroneously believe, for example,

that memories obtained through hypnosis are more likely to be accurate than those simply recalled, and that hypnosis can be used to recover accurate memories even from as far back as birth. Such misinformed views can lead to misapplications of hypnosis when attempting to actively recover memories of presumably repressed episodes of abuse, possibly resulting in the recovery of suggested rather than actual memories.

Experimental psychologists tended to doubt the accuracy of the memories recovered via hypnosis and related techniques (e.g., Spanos, 1996; Wagstaff, 1989, pp. 340–57). A considerable amount of experimental evidence shows that the hypnotic regression procedure is such that it provides a context in which individuals often produce an account mixing fantasy with pre-existing knowledge and expectations — and may then come to believe with total conviction that the account reflects events that really took place (McConkey *et al.*, 1998, pp. 227–59). Recent reviews by Kebbell and Wagstaff (1998) and Lynn and McConkey (1998) conclude that there is little or no evidence to support the claim that hypnosis can reliably enhance the accuracy of eyewitness memory.

Indeed, experimental psychologists have expressed doubts about the very concept of repression itself. The idea that the unconscious mind can somehow automatically take over and hide away memories for traumatic events is not supported by any convincing experimental evidence (Holmes, 1990, pp. 85–102). However, it must also be recognised that convincing experimental evidence for repression would be almost impossible to produce for ethical reasons. The severity of the traumatic intervention which clinicians suspect would be required to produce repression is far more extreme than the experimental manipulations that any ethics committee would approve.

Data are available from real-life contexts supporting the claim that some people experience traumatic events and subsequently appear to be unable to recall those events. Williams (1994), for example, showed that many women with a documented history of childhood sexual abuse did not report the abuse when interviewed twenty years later. Loftus *et al.* (1994) reported that 19 per cent of their sample of women reporting childhood sexual abuse felt that they had forgotten the abuse for periods of their life, only for the memory to return later. There are numerous difficulties in interpreting the findings from such studies as they relate to the concept of repression. Loftus *et al.* (1994) consider a number of these, including the fact that some such events would elude recall due to childhood amnesia and, in other cases, the ordinary mechanisms of forgetting. Furthermore, it is possible that some women may actually remember the abuse but choose not to reveal this to the interviewer. Femina *et al.* (1990), in a study of childhood physical abuse, found that some interviewees with documented abuse histories simply denied ever having been abused. However, when confronted with the evidence of abuse during a second follow-up interview, the interviewees admitted they could remember the abuse. Reasons for initially denying the abuse included ‘embarrassment, a wish to protect parents, a sense of having deserved the abuse, a conscious wish to forget the past, and a lack of rapport with the interviewer’ (p. 229).

To a large extent, whether or not repression ever occurs, in the sense of an active, unconscious, automatic and involuntary suppression of traumatic memories, is not centrally important to the issues addressed in this paper. Readers are referred to collections edited by Conway (1997), Davies and Dalgleish (2001), Lynn and McConkey (1998), Pope and Brown (1996) and Schacter (1995), for a range of views on the wider issues surrounding this debate. For our purposes, it is sufficient that the controversy led to increased research activity in the area of false memories.

In the early days of the controversy, those who believed that recovered memories were largely accurate would sometimes object that, although memory for peripheral details of a witnessed event might be distorted, there was little evidence that people were prone to false memories for episodes that had never actually occurred at all. In fact, we now know that it is alarmingly easy to implant false memories in a sizeable minority of the population using well-established experimental techniques.

There is now a considerable amount of experimental literature available regarding false memories. However, it is unclear whether different experimental approaches lead to different types of false memory and as yet no single theory can fully account for all of the available data. Intuitively, some experimental approaches appear to be of greater relevance to assessing the likely reliability of accounts of anomalous events than others. The different approaches described below vary in a number of important ways. Some approaches involve studying distortions of memory for events that were actually witnessed, whereas more recently attempts have been made to implant false memories for entire episodes that were never witnessed at all.

Some commentators would include the extensive literature on the so-called 'misinformation effect' established by Loftus and colleagues in the 1970s (e.g., Loftus *et al.*, 1978) within the false memory framework. In general, such studies have involved showing participants slides or video clips of events such as traffic accidents or criminal acts and subsequently reading text which includes misleading information about the witnessed event. Participants frequently incorporate the misinformation into their memory for the event as demonstrated in recall or recognition tasks. Studies investigating the effects of leading questions upon recall and recognition (e.g., Loftus, 1975), as described above, can also be considered within the misinformation framework insofar as they involve a deliberate attempt to distort a memory for an actual witnessed event. The actual events in question may range from the trivial (e.g., falsely recalling single words) to the mildly traumatic (e.g., getting lost as a child in a shopping mall).

Roediger and McDermott (1995) replicated an effect first demonstrated by Deese (1959) in which participants were presented with a list of words all strongly semantically related to a critical non-presented word. For example, the words *thread*, *pin*, *sewing*, *point*, and so on, were presented, but the word *needle* was not. Subsequently, the critical lure word (in this example, *needle*) was falsely recalled or recognised with great confidence by many participants.

Arguably of more direct relevance to reports of anomalous events are those studies that have attempted to implant false memories for entire episodes that in all probability never occurred. Loftus and Pickrell (1995), for example, found that partial or complete false memories for a plausible but false childhood event (i.e., getting lost in a shopping mall) could be implanted in around 25 per cent of their participants. This was achieved by repeatedly interviewing the participants and getting them to try to recall as much detail as possible for four childhood events, three of which had actually occurred (according to other family members) plus the false event. Similar results were reported by Hyman *et al.* (1995). Other techniques that have been successfully used to implant false memories rely upon the use of other forms of false feedback to convince participants that events that they initially cannot remember must have actually taken place. Mazzoni and Loftus (1998) found that telling participants that the contents of their dreams indicated that certain events must have taken place before the age of three led to a dramatic increase in reports of corresponding memories.

Orne (1979) is one of a large number of investigators to show that suggestions made to hypnotically susceptible individuals following a hypnotic induction procedure will often lead to those individuals reporting memories for events that never occurred (e.g., being woken up in the night by a loud noise). However, numerous studies have now demonstrated that simply imagining events that never occurred can also lead to the formation of false autobiographical memories, a phenomenon that is known as 'imagination inflation' (Loftus, 2001). For example, Garry *et al.* (1996) had participants indicate which of a number of childhood events had or had not happened to them personally. Two weeks later, participants were asked to imagine some of the events that they had indicated had not happened to them. Subsequently, their confidence that these events had actually taken place was significantly increased relative to similar events that had not been imagined.

Further research is needed on the relationship between laboratory-based measures of susceptibility to false memories and susceptibility to false memories in more ecologically valid contexts. In general, experimenters adopt a single measure of false memory formation and so it is not clear whether or not the different measures would all inter-correlate, supporting the notion of a general susceptibility to false memories. Alternatively, it may be more accurate to think in terms of a number of distinct susceptibilities, each of which are related to different underlying brain mechanisms. It is worth noting, however, that Platt *et al.* (1998) reported that susceptibility as assessed using Roediger and McDermott's (1995) word-list technique was positively correlated with susceptibility to false autobiographical memories.

A full discussion of different theoretical approaches to false memories is beyond the scope of the current article (see Brainerd *et al.*, 2000, pp. 93–127, for further details). Although some apparent false memories can be accounted for in terms of demand characteristics and participants actually reporting accurate memories for misinformation (McCloskey & Zaragoza, 1985), it is now generally accepted that false memories really can be produced using the paradigms

described above. Early 'single-trace' theories assumed that only one memory trace was laid down for each event and that this trace had to be overwritten or distorted in some way for a false memory to result. However, such theories have largely been supplanted by 'multiple-trace' theories in which more than one memory trace is associated with each event and false memories occur when there is confusion regarding which traces are accurate.

One influential theory of false memory development is that put forward by Hyman and Kleinknecht (1999, pp. 175–88). They proposed that three processes are involved in the development of false memories. First, the presented information is judged with respect to plausibility. Such judgements will be dependent upon the source of the information and the pre-existing beliefs of the individual. Second, an event memory must be constructed on the basis of schematic knowledge plus personal experiences, suggestion and current situational demands. Finally, the individual must commit a source monitoring error in which the constructed memory is accepted as reflecting the initial event rather than misinformation presented following the event.

Several other models of false memory also assume that errors of source monitoring underlie false memories. Source monitoring refers to the ability to accurately determine the original source of information (Johnson *et al.*, 1993) where the original sources could represent any number of internal or external sources. Internal sources might include imagination, dreams or hallucinations. External sources might include written text, pictures, verbal utterances (by a range of speakers) and so on. One particular aspect of source monitoring which is of potentially great relevance to the topic of this paper is that of reality monitoring, i.e., the more general ability to distinguish between memories based upon external events and those generated by internal mental processes (Johnson & Raye, 1981). Indeed, a number of experimental techniques have been developed to allow measurement of reality monitoring ability in which participants are presented with some stimuli and asked to internally generate others, for example by imagining them. The number of errors made in subsequently deciding which stimuli were presented and which were simply imagined provides an index of reality monitoring ability. Several commentators view errors in which imagined items are confused with presented items as themselves being false memories and have used standard reality monitoring tasks to assess susceptibility to false memories (e.g., Blackmore & Rose, 1997).

III: Further Examples of Probable False Memories for Anomalous Events

Section II.2 above dealt with several instances where one could be certain that the situations concerned did not involve paranormal forces because they were entirely under experimental control and objective records existed of the events involved. It is often the case, however, that the only source of evidence is the allegedly first-hand report itself. In the case of alien abduction claims and past-life regressions, a strong circumstantial case can be made that we are indeed often dealing with instances of false memory.

1. Alien abduction claims

It appears that the circumstances under which detailed reports of alien abduction are produced are exactly those that one would expect to lead to the formation of false memories. Blackmore (1994, p. 30) provides the following report of an alleged alien abduction. It is a fictional composite account based upon her investigations of numerous cases:

I woke up in the middle of the night and everything looked odd and strangely lit. At the end of my bed was a four-foot-high grey alien. Its spindly, thin body supported a huge head with two enormous, slanted, liquid black eyes. It compelled me, telepathically, to follow and led me into a spaceship, along curved corridors to an examination room full of tables on which people lay. I was forced to lie down while they painfully examined me, extracted ova (or sperm) and implanted something in my nose. I could see jars containing half-human, half-alien foetuses and a nursery full of silent, sickly children. When I eventually found myself back in bed, several hours had gone by.

Those who believe that alien abduction accounts accurately reflect events that really occurred often argue that the aliens involved are generally capable of rendering their victims almost totally amnesic with respect to the episode. The abductee may, for example, only remember waking up in his or her bedroom and being unable to move. Alternatively, the abductee may remember nothing at all, and simply be aware of a period of 'missing time'. Such experiences are open to various more conventional explanations, but some ufologists (e.g., Hopkins *et al.*, 1992) insist that they actually indicate a high probability that the victim was abducted. If such an explanation appears to offer a plausible explanation to the person who experienced it, that person may be interviewed by a therapist specialising in alien abduction cases to see if they can recover further details. Spanos *et al.* (1994, p. 438; see also, Spanos, 1996) comment as follows:

Frequently, the interviews include two phases. In the first phase background information is obtained and clients are asked about unusual or inexplicable experiences that have occurred during their life. These include 'missing time' experiences, unusual or bizarre dreams, and experiences that suggest hypnagogic imagery or sleep paralysis (e.g., having seen a ghost, strange lights, or a monster). Such experiences are defined as distorted memories of alien abduction that call for further probing (Jacobs & Hopkins, 1992). Moreover, making such experiences salient enhances the likelihood that some of their characteristics (e.g., paralysis, feelings of suffocation) will be incorporated into any abduction memories that are recalled in Phase 2. Phase 2 typically involves hypnotic or non-hypnotic guided imagery employed to facilitate recall. This may involve leading questions (Baker, 1992), or the subject may be pressed repeatedly for more details (Jacobs, 1992). In addition, subjects may be informed that some material is so deeply hidden that several such interviews are required. Subjects who have difficulty 'remembering' some or all of their abduction are defined as 'blocking' and are provided with strategies for facilitating recall. These include asking subjects to imagine a curtain and then to peek behind it to view their abduction, or to imagine a movie screen on which they see their abduction replayed (Jacobs & Hopkins, 1992).

The creation of false memories is clearly implicated in UFO abduction claims, but several other factors are also involved (see, e.g., Appelle *et al.*, 2000, pp. 253–82; French, 2001b, pp. 102–16; Holden & French, 2002), although discussion of such additional factors is beyond the scope of this article.

2. *Hypnotic past-life regression*

Some believers in reincarnation believe that it is possible to hypnotically regress individuals not only back to childhood, but back to previous incarnations. A Cardiff-based hypnotherapist, Arnall Bloxham, was the subject of a BBC documentary and subsequently featured in a book by Iverson (1977). At first sight, it appeared that Bloxham had used hypnotic regression to produce incontrovertible proof of reincarnation. One of his cases in particular, that of a Welsh housewife referred to as Jane Evans, appeared to be very impressive. She provided details of six previous incarnations, many with a wealth of historically correct background information. In one life, she was a maid in the house of a wealthy French merchant named Jacques Couer in the fifteenth century.

Although Iverson felt that the case for reincarnation was established, subsequent investigation by Harris (1986) proved him wrong. In fact, in both of these cases and others, there were significant errors in the accounts produced. For example, Jane Evans reported that Couer was single with no children. In fact, he was married with five children — something that most maids would notice. Such errors provided the clue to the source of the story. A novel by Thomas B. Costain entitled *The Moneyman* was based upon Couer's life but the author had taken the literary liberty of deliberately omitting Couer's family as they kept getting in the way of the plot development. It appears that Evans had read the book and then forgotten reading it. During the hypnotic sessions these details had re-emerged and had been taken to be real memories.

In the case of Jane Evans and many other similar claims, it is generally believed that no deliberate hoax was involved. Instead, these are seen as being cases of cryptomnesia (literally, 'hidden memories'; see Baker, 1992). It is argued that an individual can store away information from a variety of sources during his or her life, such as from novels, films, history books, or wherever, without later being aware of the source of the information. When the information is later recalled under hypnosis, perhaps elaborated upon by the individual's own fantasies, the memories can be taken to be veridical.

Spanos and colleagues (1994) summarise some of their own studies of past-life regression. It appears that a particular type of personality is very prone to producing detailed accounts of past lives under hypnosis. Such individuals score highly on measures of fantasy-proneness. They are highly imaginative individuals with a rich fantasy life and sometimes have difficulty separating fantasy from reality. They become engrossed in works of fiction to the extent that they lose themselves. Elsewhere, Spanos *et al.* (1991) have reported the results of studies in which individuals were hypnotised and regressed into past lives and then asked for details of their past life. Information that any individual living at

the time would be aware of (e.g., the country's currency, ruler, etc; is the country at war?) is usually not known by the participant. Whether or not participants subsequently accept their past-life memories as evidence of reincarnation depends upon whether they believe in the possibility of reincarnation and the expectations built up by the experimenter.

IV: Is There a Link Between Susceptibility to False Memories, Paranormal Beliefs and Tendency to Report Paranormal Experiences?

Within the last few years, attention has turned to the issue of why some individuals seem to be more prone to false memories than others. A number of psychological factors have been identified as being correlated with such susceptibility and the degree to which such factors have been found to correlate with the tendency to report anomalous experiences is of considerable interest. If common factors were found linking both susceptibility to false memories and tendency to report anomalous experiences, this would strengthen the *prima facie* case that at least some reports of anomalous experiences may be based upon false memories. Not surprisingly, the link between paranormal belief and reports of personal experience of ostensibly paranormal phenomena is already well established. Those who feel they have had personal experience of the paranormal are understandably far more likely to believe in the paranormal.

Dobson and Markham (1993) and Markham and Hynes (1993) reported that participants with vivid visual imagery were more likely to make source-monitoring errors. Hypnotic suggestibility has been found to correlate with number of false memories reported by a number of investigators (e.g., Barnier & McConkey, 1992; Laurence & Perry, 1983; Sheehan *et al.*, 1991). Heaps and Nash (1999) found that susceptibility to imagination inflation was correlated with indices of hypnotic suggestibility and dissociativity, but not with vividness of imagery or interrogative suggestibility. However, a subsequent study by Horselenberg *et al.* (2000) did find a correlation between imagination inflation and imagery ability, using a different measure of the latter. Tomes and Katz (1997) assessed habitual susceptibility to misinformation by presenting participants with three events involving misinformation. They found it to correlate with vivid visual imagery (as well as spatial dexterity and emotional empathy for others). Eisen and Carlson (1998) reported that susceptibility to misinformation was positively correlated with both absorption and dissociation. *Absorption* has been described by Tellegen and Atkinson (1974) as 'a disposition for having episodes of single "total" attention that fully engage one's representational (i.e., perceptual, enactive, imaginative and ideational) resources'. It is commonly measured using the Tellegen Absorption Scale (Tellegen & Atkinson, 1974).

Hyman and Billings (1998) attempted to implant false childhood memories in participants using a similar approach to that employed by Loftus and Pickrell (1995). Using this technique, susceptibility to false memories was found to correlate with scores on the Creative Imagination Scale (CIS; a measure of both hypnotisability and imagery) and dissociativity, but not with absorption or social

desirability. Platt *et al.* (1998) used two measures of memory distortion in their study: scores on Roediger and McDermott's (1995) word task (described above) and naturally occurring distortions of autobiographical memory. Only one significant correlation was found between either of the two memory measures and measures of absorption, dissociativity and fantasy-proneness: absorption was negatively correlated with accuracy of autobiographical memory. Although no significant correlations were found between the word task and personality measures in this study, a previous investigation by Winograd *et al.* (1998) had found significant correlations between both dissociativity and vivid imagery and susceptibility to false memories. CIS scores were not correlated with proneness to false memories in this study.

A number of psychological factors have thus been found to correlate with susceptibility to false memories, although there is considerable variation across studies. It is likely that this reflects, to some extent, the use of different measures of susceptibility, suggesting that different types of false memory may well depend upon different mechanisms. As stated, if the same psychological factors also correlate with paranormal belief and reports of anomalous experiences, it would strengthen the argument that at least some such reports may depend upon false memories.

Imagery ability has also been found to correlate with paranormal beliefs (Finch, 2002; Greening, 2002; Diamond & Taft, 1975). Furthermore, although people who report out-of-body experiences (OBEs) do not score higher than non-OBEers on standard imagery questionnaires (e.g., Blackmore, 1982; Irwin, 1981a), they do seem to be superior in terms of using spatial imagery to create novel perspectives (e.g., Blackmore, 1986, pp. 108–11; Cook & Irwin, 1983).

A number of studies have demonstrated a small but significant correlation between hypnotic susceptibility and belief in the paranormal (e.g., Diamond & Taft, 1975; Palmer & Van Der Velden, 1983; Wagner & Ratzenberg, 1987), although some studies have failed to find such a relationship (e.g., Groth-Marnat *et al.*, 1998–99; Pekala *et al.*, 1995). Atkinson's (1994) study is exceptional in finding a relatively large correlation ($r = .53$) between hypnotic susceptibility and belief in the paranormal. Other investigators have shown that groups of highly hypnotisable participants report higher levels of paranormal belief than those with less susceptibility (Nadon *et al.*, 1987; Pekala *et al.*, 1992; Pekala *et al.*, 1995; see Kumar & Pekala, 2001, pp. 260–79, for a thorough technical review of this area).

Hypnotic susceptibility has also been found to correlate with a range of reported paranormal and anomalous experiences (e.g., Atkinson, 1994; Nadon & Kihlstrom, 1987; Palmer & Van Der Velden, 1983; Pekala *et al.*, 1995; Spanos & Moretti, 1988; Wagner & Ratzenberg, 1987; Wickramasekera, 1989, pp. 19–35), although once again there are occasional studies that fail to find such a relationship (e.g., Persinger & De Sano, 1986). Richards (1990, p. 35) reported 'low and marginally significant' correlations between hypnotic susceptibility and self-reports of psychic experiences. Studies have also compared groups differing

in hypnotic susceptibility and have found differences in the degree to which anomalous/paranormal experiences are reported (e.g., Pekala *et al.*, 1992; 1995).

Absorption correlates moderately with paranormal belief (Palmer & Van Der Velden, 1983), subjective paranormal experiences (e.g., Irwin, 1981a) and mystical experiences (Spanos & Moretti, 1988). Both Irwin (1981b) and Myers *et al.* (1983) found that students who reported OBEs also demonstrated higher levels of absorption than those who did not. Irwin (1985) showed that the need for absorption was higher in experiencers than non-experiencers for a wide range of subjective paranormal experiences.

Dissociativity has often been shown to be correlated with paranormal belief (e.g., Greening, 2002, Study 2.2; Irwin, 1994; Pekala *et al.*, 1995; Wolfradt, 1997), but some studies have failed to find such a relationship (Greening, 2002, Study 2.1; Groth-Marnat *et al.*, 1998–99). Makasovski and Irwin (1999) present data suggesting that pathological dissociation predicts belief in parapsychological and spiritual concepts, but that non-pathological dissociative tendencies (absorption) do not correlate with paranormal belief. Rattet and Bursik (2001) reported that dissociative tendencies were related to paranormal belief, but not to self-reported precognitive experiences. Dissociativity has been shown to be related to the tendency to report a wide range of paranormal and anomalous experiences (Pekala *et al.*, 1995; Richards, 1991; Ross & Joshi, 1992; Ross *et al.*, 1991). Powers (1994) has shown that a group of alleged alien abductees showed higher levels of dissociativity than a matched sample of non-abductees. Children reporting past-life memories have been shown to have higher levels of dissociative tendencies in both Sri Lanka (Haraldsson *et al.*, 2000) and Lebanon (Haraldsson, 2002). Greyson (2000) has reported that although people reporting near-death experiences (NDEs) are psychologically healthy, some do show non-pathological signs of dissociation. The possibility that at least some reports of NDEs may be based upon false memories was raised by French (2001c) in a commentary on a prospective study of NDEs by van Lommel *et al.* (2001). The latter investigators interviewed a number of patients two years after they had suffered cardiac arrests that they had reported at the time were not associated with NDEs. At the two-year follow-up interviews, however, four of the 37 patients now reported that they had indeed experienced NDEs during their cardiac arrest.

In summary, it appears that there are numerous studies supporting an association between paranormal beliefs and reports of anomalous experiences on the one hand and a range of psychological factors thought to be associated with increased susceptibility to false memories on the other. It is important at this point to emphasise, however, that this pattern of correlations is also consistent with an alternative interpretation, one that is taken seriously by many parapsychologists. It is possible that individuals who score highly on such measures as dissociativity, hypnotic susceptibility and so on have the right psychological profile to experience genuine paranormal phenomena (if they actually exist). Of course, the false-memory hypothesis and the psi hypothesis are not mutually

exclusive. The correct interpretation of the pattern of findings will only be resolved by empirical investigation.

Having established a *prima facie* case for a link between false memories and paranormal beliefs and tendency to report anomalous experiences, we shall now review the relatively few studies that have investigated the postulated link directly. Haraldsson (1985) reported a low but significant correlation between suggestibility (as measured by the Gudjonsson Suggestibility Scale) and global paranormal beliefs (as measured by Tobacyk's Paranormal Belief Scale, PBS). Of the seven sub-scales of the PBS, only those measuring belief in witchcraft, spiritualism and precognition were significantly correlated with suggestibility.

Blackmore and Rose (1997) tested the hypothesis that susceptibility to false memories would be correlated with paranormal belief using a reality-monitoring task. Participants were initially shown simple drawings of objects or asked to imagine drawings of objects. Over subsequent sessions spanning a number of weeks, they were questioned regarding their memory of the pictures (both real and imagined). In a final session, they were asked to indicate whether each drawing had initially been presented or imagined. A false memory was recorded every time a picture that had only been imagined was recorded as having been presented. No correlation was found between susceptibility to false memories and paranormal belief. Three similar experiments by Rose and Blackmore (2001) also failed to find the predicted relationship. Greening (2002), using a similar methodology, did find a significant correlation in the predicted direction, but was unable to replicate the effect in two follow-up experiments.

Clancy *et al.* (2002) used the word list paradigm of Roediger and McDermott (1995) in a study comparing people with recovered memories of alien abduction, people who believed they had been abducted but without such memories, and people who denied having been abducted by aliens. The group with memories of abduction were shown to be more susceptible to false memories than the control participants. Furthermore, false recognition and recall were correlated with hypnotic susceptibility, depressive symptoms and schizotypic features.

V: Directions for Future Research

It is clear that direct attempts to prove a link between susceptibility to false memories and reports of anomalous experiences have so far met with only limited success. However, this may reflect the methods that have been used to date to test the hypothesis. It is unlikely that all of the different measures of susceptibility to false memory are measuring the same thing. It would therefore be advisable if future studies concentrated mainly upon those techniques that would appear to be most relevant to the possibility that memories for certain types of event may sometimes be false. Intuitively, naturally occurring distortions of autobiographical memory and susceptibility to implanted memories of entire episodes would seem to be the most relevant. Measurements of reality monitoring errors would appear to be of less relevance unless it could be shown that errors made in the task used by Blackmore and Rose (1997) generalise to more serious confusions

(such as between daydreams and reality). Susceptibility to misinformation is of some relevance, but one assumes that in everyday life it would be relatively rare for another individual to try to deliberately manipulate someone else's memory. Unintentional distortion by discussion with another individual is always a possibility, however. Finally, it is ironic that the word list paradigm is one of the few which seem to have been successful in discriminating between a group who had reported a particular anomalous experience and control groups (Clancy *et al.*, 2002), given the apparent lack of ecological validity of the task itself. This important finding awaits replication, however.

Another possible reason for the inconsistency in results to date is that many investigations have focussed upon belief in anomalous phenomena rather than reported experiences of anomalous phenomena. Although one of the most common reasons given for belief in the paranormal is personal experience, it is by no means the case that all believers have had such personal experience. There are many other reasons for belief in anomalous phenomena including media reports, personal accounts from trusted others, and so on. Clearly, one would expect a higher correlation between susceptibility to false memories and actual reports of particular anomalous experiences rather than belief in those anomalous phenomena. A further recommendation for future research in this area is that greater emphasis should be placed upon searching for correlates of the tendency to report anomalous phenomena as opposed to simply believing in them.

As is usually the case when considering psychological factors associated with paranormal and related beliefs, the studies reviewed above are generally quasi-experimental in nature. Participants cannot be randomly assigned to high and low paranormal belief groups. It is possible that susceptibility to false memories causes people to come to believe they have had a paranormal experience (even if they have not) which then produces or reinforces their belief in some particular aspect of the paranormal. On the other hand, it is reasonable to argue that pre-existing beliefs play a causal role in the acceptance of potential false memories as authentic. According to Hyman and Kleinknecht (1998), plausibility is an important factor in making such decisions. Whereas a fleeting memory of an ostensibly anomalous experience might be dismissed as probably being the memory of a dream by a sceptic, a believer is more likely to accept that it may reflect something that actually happened. Further reflection and elaboration may then lead to a more detailed and vivid 'memory'.

It must be emphasised, however, that memory distortion and the formation of false memories can never provide a complete explanation for all reports of anomalous events, nor is it intended to do so. A wide range of other factors needs to be taken into account (see, e.g., Cardeña *et al.*, 2000; French, 1992; Roberts & Groome, 2001; Zusne & Jones, 1989). To take but one example, a sincere report of having seen a ghost may well actually be a more or less accurate report of an hallucinatory experience. It is possible that the intense emotion generated by the experience may lead to less reliable testimony (e.g., Loftus, 1979) but the report is best understood by considering primarily the psychology of hallucinations (Bentall, 2000, pp. 85–120).

It is possible that much of what we take to be our personal autobiographical history is based upon false, or at least distorted, memories. This usually is not drawn to our attention because no one is likely to challenge mundane memories of ordinary everyday events unless one person's memory actually directly contradicts another. With respect to paranormal and related claims, however, the situation is entirely different. A listener may decide that a particular account must be inaccurate simply because the account contradicts that person's understanding of what is and what is not possible. Is it reasonable that such a person, without any claim whatsoever to first-hand knowledge of the events in question, should feel justified in adopting this sceptical position? On the basis of the evidence reviewed above, the answer has to be affirmative.

The review of recent developments in the area of false memory research suggests that a *prima facie* case can be made for a possible link between susceptibility to false memories and tendency to report anomalous experiences. One of the most important factors associated with paranormal and related beliefs is alleged personal experience of anomalous events and thus an indirect link may exist between susceptibility to false memories and level of belief. Alternatively, as described above, it may be that pre-existing beliefs play an important role in determining whether potential false memories are accepted as records of events that really occurred. They may also play a role in determining the content of such memories, as schema-driven distortions are likely to occur. To date, the few direct tests of the postulated links between susceptibility to false memories, reports of anomalous experiences, and level of paranormal and related beliefs have met with only limited success, but further research, taking into account the issues discussed above, is certainly warranted.

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