

**THE RELATIONSHIP BETWEEN  
FALSE MEMORY AND  
PARANORMAL BELIEF**

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## *ABSTRACT*

The thesis investigates the effects of false memory and belief in the paranormal on reports of events. The first chapter reviews the existing literature on false memory. The main theories of how false memory develops are described and the individual differences of those susceptible to false memories are considered. The paranormal belief literature is then examined, particularly with regard to the cognitive differences between believers and disbelievers. It is concluded that these differences would be suggestive of a relationship between paranormal belief and false memory.

The second chapter considers the relationship between imagination inflation, paranormal belief and ESP. No correlation between the factors was found. The third chapter examines whether pre-event suggestion and belief in the paranormal can affect experiences of 'ghostly' phenomena in an allegedly haunted location. Evidence for the effect of belief in the paranormal was found, but there was no effect of pre-event suggestion or an interaction between the two factors. The fourth chapter investigates the effects of positive and negative during-event suggestion and paranormal belief on reports of events in the séance room, and the fifth chapter explores the effects of during-event suggestion on reports of a key bending video. There was some evidence that during-event suggestion is effective in altering reports of events, and the causes for this effect are considered. Paranormal belief was not shown to consistently affect acceptance of suggestion, but may affect reports of phenomena which are judged to be paranormal.

The thesis concludes that during-event suggestion and negative suggestion are areas which offer great potential for further research. The relationship between paranormal belief and false memory development has not been demonstrated. However, it has been shown that belief and suggestion can affect the manner in which situations are attended to and interpreted.

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## ***CHAPTER 1: THE RELATIONSHIP BETWEEN FALSE MEMORY AND PARANORMAL BELIEF***

This thesis investigates the possible relationship between false memory, suggestibility and belief in the paranormal. The work builds on previous research looking at the effects of imagination and misleading information on memory, and expands the existing literature by considering the role of pre-event and during-event suggestion.

This introduction firstly reviews the existing literature on false memory, describing the existing protocols for developing false memories, the main theories explaining the false memory effect and the individual differences of those susceptible to false memory generation. It then considers the belief in the paranormal literature, specifically considering the evidence that believers and disbelievers have differing cognitive processes and susceptibility to suggestion. The findings indicative of a possible relationship between the two factors are then examined.

### **FALSE MEMORY**

Surprisingly for such a pervasive concept as ‘false memory’, there is no clear definition in the literature as to what actually constitutes a false memory. Entire books have been written on the subject without the authors fully explaining what the phrase actually means (e.g. Spanos, 1996; Bjorkland, 2000). In some cases, the term is used interchangeably with ‘memory distortion’, ‘repressed memory’ or ‘recovered memory’ (e.g. Loftus & Ketcham, 1994; Ofshe & Watters, 1994). Schacter (1995), reviewing studies of clinical patients, suggests that false memory could be broken down into two separate areas: ‘confabulation’ “where patients misremember the time and other contextual aspects of actual events” (p. 11); and ‘fabrication’ “where patients concoct improbable and bizarre scenarios that could not have in fact occurred” (p. 11). Despite this emphasis on false memory as a symptom of a neurological disorder, Loftus and Ketcham (1991) indicate that development of false memory may be the norm for most people. They argue that, because the human memory is fallible and liable to be



reconstructed according to the current situation, most of the things that are 'remembered' are, at best, rough approximations of what actually occurred. The difference between false memories for everyday events and false memories for large, traumatic events is that everyday events are rarely questioned in detail, so the degree of memory error is not discovered.

The researchers seem to agree that false memory does not involve forgetting, or lack of encoding at the time. Instead, for a memory to be 'false' it should be distorted in some way. This could involve the alteration or elaboration of an existing event, or a memory created where one did not previously exist.

There are two main areas of false memory currently being investigated by researchers. The first of these is false memory developed as a result of misleading information being suggested to participants. The second is false memory developed as a result of source confusion or imagination inflation.

### **Misinformation in laboratory studies**

Traditional misinformation studies have followed the paradigm established by Loftus and colleagues in the 1970s. For example, Loftus, Miller and Burns (1978) ran a series of studies which involved showing participants slides depicting a traffic accident. They were then read a narrative which contained misleading information about the slides which they had just seen (specifically, the narrative claimed that the slides showed a yield sign rather than a stop sign). Participants were then tested on their recall of the events. A strong and consistent effect has been found whereby the misinformation affects participants' reports of the scene that they viewed. A great deal of discussion has taken place as to the extent of interference and memory impairment that results when participants are subjected to false information. McCloskey and Zaragoza (1985) argued that the original misinformation studies did not actually affect memory and the results obtained were a mixture of incorrect interpretation of results, and demand characteristics caused by the experimental setting. For example, a participant may clearly remember seeing the original stimuli but will appear to accept the misinformation because they feel

that that is what the experimenter wants. According to McCloskey and Zaragoza, the obtained results were indicative that a situation in the original scene was not adequately encoded, and therefore the misinformation was filling a gap in knowledge rather than overwriting existing knowledge. Alternatively, the participants may simply have been guessing the answers.

McCloskey and Zaragoza's hypothesis caused researchers to refine studies in order to fully assess whether misinformation can, in fact, affect memory. The original paradigm involved participants being asked whether they saw the misleading item or the original item. Belli (1989) introduced a new testing procedure where participants were asked to give yes or no answers to one of two possible questions; whether they saw the original item or a novel item (not previously mentioned) related to the other two items. No participant was questioned about both the items. Tversky and Tuchin (1989) asked three separate questions; did they see the original item, did they see the misleading item, and did they see a new item. Both papers indicate that participants who received misleading information were less likely to give 'yes' answers to the original item. Misled participants also tended to reject the possibility of having seen the new item, thus suggesting that they were not simply randomly guessing the correct answer.

Loftus, Donders, Hoffman and Schooler (1989) presented evidence which indicated that the misinformation causes interference with the original memory trace, although it does not necessarily replace the original memory. Their studies were carried out using a similar paradigm to that of Loftus et al. (1978), with participants being shown a slideshow of a burglary and then being subjected to misinformation. In a recall test, participants quickly and confidently selected the misinformation as being the correct answer. However, some participants were not presented with the misinformation item as a possible option. In these cases, participants selected the original item as often as control subjects, but their responses were much slower. This indicates that although the original memory was still present, the misinformation had created difficulty in retrieval. Loftus and Hoffman (1989) reviewed the basic changes to the misinformation paradigm and concluded that there was now little support for the notion that memory was not

affected by misinformation, but there remained considerable confusion as to the exact nature of the changes to memory.

Studies have also been conducted to examine whether false memory generation is caused by source monitoring errors (Lindsay & Johnson, 1989a). This indicates that participants remember the suggested item, but fail to remember whether it occurred in the original stimuli or the misinformation. Lindsay and Johnson (1989b), and Rantzen and Markham (1992) conducted studies using what they called the 'reversed eyewitness testimony design' in order to test the source monitoring account. This involves presenting participants with a piece of misinformation before showing the stimuli. Rantzen and Markham (1992) extended Lindsay and Johnson's original design to include different contexts for the introduction of the misinformation. The misinformation was either presented by an experimenter reading aloud or through the form of a read narrative. The purpose behind this was to investigate the possibility of context effects and demand characteristics affecting the results. The researchers reported that there was no effect of misinformation context, indicating that participants were not answering in accordance with the wishes of the experimenter. However, suggestion continued to affect responses, with participants reporting the misinformation as accurate. These studies provide strong support for the source monitoring explanation for the misinformation effect, indicating that participants accept misinformation because they do not remember where it comes from. The studies were also an important indication that suggestion does not have to occur after an event in order to successfully alter accounts of that event.

The misinformation studies described thus far concern incorrect responses to small scale laboratory based events. However, studies have also been conducted examining whether it is possible to affect autobiographical memories using misinformation.

### **Misinformation in autobiographical memories**

The laboratory based studies of misinformation have been very successful in altering accounts of events viewed. However, the research into misinformation and suggestion

has now been extended in order to examine whether participants could alter their real-life memories as a result of suggestion. Loftus (1997) describes her 'lost in a shopping mall' experiment, in which she succeeded in implanting 'memories' for childhood events that never happened (see also Loftus & Pickrell, 1995). For each participant, a booklet was prepared containing short narratives about three events that had actually happened (provided by a family member) and one false event – namely the scenario of being lost in a shopping centre. After reading the booklet, the participants were asked to write down everything they recalled about each of the four events, and this was followed by two subsequent interviews in which they were questioned about their recollection of the events. There was a high level of recollection for the true events at each of the three test stages, with approximately two thirds of the scenarios being recalled. With regard to the false event, one third of the participants claimed to remember being lost in the shopping centre consistently over the three stages of interview. Hyman, Husband and Billings (1995) report similar levels of suggestion acceptance in their study of implanted childhood memory. They used a similar protocol to that of Loftus, but included a variety of false childhood events such as hospitalisation with an ear infection or attending a birthday party where there was a clown. They found that, although none of the participants recalled the events at the initial interview, one fifth claimed that they remembered it at the second interview.

The creation of false childhood memories through misinformation was extended further by Porter, Yuille and Lehman (1999). They used a similar technique to that of Loftus (1997) and Hyman et al. (1995) but concentrated on implanting memories for highly emotional situations in which a child would experience above average levels of stress (such as serious attack by an animal or a serious medical procedure). This was for two reasons; firstly, it is unlikely that these items could be mistaken for other childhood events; and secondly, if Porter et al. succeeded in implanting memories for traumatic childhood experiences, there would be obvious implications for the debate into repressed memory of sexual abuse. Porter et al. comment that the previous studies involving false memories for childhood events may not be generalisable to the repressed memory debate because they involve relatively mundane events, rather than the

traumatic, extraordinary events being reported as repressed memories. Porter et al. reported that one quarter of participants developed a complete memory for the false traumatic experience and a further third of participants recalled some aspects of the event.

It has been established that it is possible to implant memories for both autobiographical and laboratory based events as a result of misinformation. Researchers were able to elicit detailed descriptions of memories which the participants claimed were accurate (Hyman & Pentland, 1996). It is worth considering, therefore, whether these reports of fictitious events are the same as real memory reports, or whether they can, in fact, be distinguished.

### **The nature of memories developed through misinformation**

Schooler, Gerhard and Loftus (1986) indicated that memories of perceived events should differ from memories of events that have been suggested because of the different processes involved in creating the memories. Memories for events that have actually been witnessed should contain more sensory detail because those details are encoded when the event is perceived. In contrast, Schooler et al. suggest that memories derived from misinformation should include references to cognitive processes that are used when the individual imagines the event. Schooler et al. (1986) showed participants a slide sequence depicting a car crash. After seeing this sequence, a false memory for a road sign was implanted through suggestion. Participants were asked to describe this sign, and the language used was compared to the language used by participants that had actually seen the sign. The experimenters found that the participants describing false memories showed less confidence and fewer words were used in the descriptions. Accounts of the signpost were less detailed with regard to sensory information (e.g. colour, size, shape), but contained more details about the purpose of the sign. Participants whose memories were a result of suggestion included more detail of their cognitive processes (for example: "...the answer I gave was more of an 'immediate' impression of what I remembered..." p. 173) and used more 'verbal hedges', such as "I

think" and "I believe". Thus, Schooler et al. report evidence for their hypothesis that real memories and those developed through misinformation differ in terms of content.

Porter et al. (1999) used similar criteria to compare descriptions of actual childhood events with descriptions of implanted and fabricated memories. They divided the criteria into two separate groups: firstly, the subjective nature of the description, such as clarity of memory, confidence, and experiencing lack of memory; and secondly, the 'presentation-specific' features of the description. This group is concerned with items such as amount of detail, coherence and relevance. The results showed that implanted memories were significantly poorer in terms of vividness and clarity and participants were less confident of these memories. Pickel (1999) placed participants in the situation of viewing a scene involving several objects on a desk. The objects were incidental to the task at hand and were not mentioned specifically, although the desk was referred to. In some cases, a calculator was on the desk at the time. In other cases, the presence of the calculator was suggested to the participants after they left the room. Pickel later asked participants to describe the calculator and found a similar pattern of results to that of Porter et al. She reported that memories developed as a result of suggestion contained less sensory information, included more verbal hedges, more use of the pronoun 'I' and more admissions of memory failure. In addition, Pickel found that participants describing suggested memories spoke faster than those describing accurate memories and made significantly more eye contact.

### **Imagination inflation**

In addition to false memories developed through misinformation, individuals are also susceptible to false memories developed naturally as a result of imagination and source confusion. Tsai, Loftus and Polage (2000) label this form of false memory 'imagination inflation'. Roediger and McDermott (1995) initiated a line of research concerning incorrect recall of words not presented in lists. Participants were read lists of words, with each list being formed of words related to one, unrepresented word (known as the critical lure). For example a list for the critical lure 'hospital' might feature words such as 'doctor', 'nurse', 'surgery', 'ward', etc. When participants were asked to recall the

lists, Roediger and McDermott found a large incidence of critical lures being 'recalled'. Furthermore, when presented with recognition lists, participants were likely to rate the critical lure as having been presented previously. These findings have been reproduced by many other researchers (e.g. Payne, Elie, Blackwell & Neushatz, 1996; Read, 1996). and the protocol has also been expanded to investigate other areas of the phenomenon. For example, Payne et al. (1996) examined the durability of the critical lure effect and found that it did not decrease over a 24 hour period, despite the fact that recognition of presented words decreased significantly in this time.

Other studies have examined whether the memories for the critical lure differ substantially from memories for presented words. Norman and Schacter (1997) analysed participants' explanations for why they believed that they had seen both types of word before. They found that participants were more likely to make associative explanations (i.e. what thoughts were triggered by the word) than sensory or contextual (i.e. what the word sounds like, where it was placed on the list) for both types of words. There were some differences in explanations given for the recollection of the different types of words. Presented words were more likely to be remembered because of their sound, their list position and the participants' reaction when they heard the word. Additionally, participants were more likely to describe the thoughts triggered by the word for presented words. Overall, Norman and Schacter conclude that false memories for critical lures were characterised by less auditory detail and fewer recollections of feelings and reactions. Mather, Henkel and Johnson (1997) performed a similar comparison and also indicated that false memories for critical lures were typified by less recollection of feelings and reactions and less auditory detail.

A related area of study is that of investigating memories for perceived and imagined events. Goff and Roediger (1998) played participants a number of different action statements (such as "Break the toothpick"), and asked them to perform some of the events and imagine others. At a later session they were asked to imagine performing some of the previously heard statements and some completely novel statements. At a final test stage, participants were asked to state whether they had heard, performed or

imagined the statements. Goff and Roediger found that the act of having imagined an event caused participants to believe that they had actually performed it. Henkel and Franklin (1998) found a similar confusion between items that had been imagined and perceived. They found that when participants were asked to imagine items that were in some way linked to perceived items, they were significantly more likely to confuse the source of the image. For instance, participants who were asked to imagine a line drawing of a lollipop, and were presented with a line drawing of a magnifying glass would later remember having seen the lollipop. This effect was evident when the paired items resembled each other (such as the magnifying glass and lollipop) and when paired items were conceptually related (e.g. knife and fork).

Garry, Manning, Loftus and Sherman (1996) asked participants to complete a questionnaire listing various life events, indicating the likelihood that they had experienced each of the events. Two weeks later, they were asked to imagine certain events and answer questions about their images. The experimenters then asked them to complete the life events questionnaire again and found that participants were more likely to rate the imagined events as having happened.

The idea of imagination inflation has implications for the manner in which police investigations, psychotherapy and court cases are conducted. Ofshe and Watters (1994) indicate that investigations into child abuse, for example, are frequently conducted with police and therapists asking the alleged victims and alleged perpetrators to imagine what had taken place. They suggest that this form of imagination inflation is an active factor in miscarriages of justice, as it encourages false accusations of abuse and false confessions. Ceci, Bruck and Battin (2000) also make this point, stating that visualisation techniques used in vulnerable groups, such as children, who have low levels of reality and source monitoring, create memories for traumatic events that never happened.

Studies have also found that imagination inflation can be used to alter memories so that events that did happen are remembered as not having taken place. Loftus and Polage



(1999, cited in Tsai, Loftus & Polage, 2000) asked a group of participants to keep a journal recording the events of each day for a week. For every day, participants were asked to give specific examples of events during the day, events that happened to their partners, a wish that they had for that day, an event that they wished had not happened and a preferred outcome for that event. Participants were then asked to imagine several events recorded in the journals and summarise their images. Later on they filled out questionnaires asking them whether the events had actually taken place. When considering the data for the events that the participants wished had not taken place, Loftus and Polage found that imagining the preferred outcome of the event caused participants to believe that the actual situation had occurred that way. For example, they cite the case of a woman who was dieting and wished that she had not eaten some cake on a particular day. After imagining a scenario where she declined the food, the participant rated the real event as false, and her preferred outcome as that which had actually happened.

The research into imagination inflation (particularly for autobiographical events) is still very new, and few theories have been suggested as an explanation for the effect. However, it is probable that there is a source monitoring error involved, as participants mistake a familiar imagined event for an actual experience (Tsai, Loftus & Polage, 2000).

### **Theories of how false memory develops**

Brainerd, Reyna and Poole (2000) proposed some minimum criteria that a theory of false memory development should meet. Firstly, they indicate that its principles should include all the paradigms in which false memories have been developed. Secondly, the principles should explain both spontaneous and implanted false memories. Thirdly, the principles should explain developmental variability in false memories. Finally, the principles should allow novel predictions for the phenomenon of false memory. Few theories have been proposed that incorporate all these criteria.

There have been a large number of theories forwarded to explain the false memory effect in general, and the misinformation effect in particular. This section aims to summarise some of the theories which have been influential in shaping the research in the field, and also which are accepted as providing the most compelling explanations of false memory development.

### *Strategic effects*

McCloskey and Zaragoza (1985) suggested that the results obtained in misinformation studies up to that point were obtained by factors other than false memory. They indicated that data suggestive of false memory development were actually created by task demands. For instance, if an individual never encoded the original information in a suggestion study, they are not developing false memories by reporting the misinformation at a later date. Instead, they are reporting their actual memories for the misinformation. Additionally, participants' responses may be affected by what they believe the experimenter wants them to write, or a confusion as to which response to make. The strategic effects debate was extremely useful as it caused experimenters to refine the paradigms used in false memory research. Ayers and Reder (1998), in a review of subsequent literature, comment that, although the effect is not as large as originally thought, even after controlling for task demands there is still a significant effect of false memory.

### *Single-trace theories*

The term 'single-trace' refers to the idea that only one memory trace for each possible event exists. Therefore, in order to develop a false memory for an original event, it is necessary to alter that trace so that it represents a new event.

### Overwriting

Loftus, Miller and Burns (1978) forwarded the 'overwriting' or 'trace alteration' account of how false memories are developed in misinformation studies. They suggested that witnessing the original event would produce a single memory trace that is overwritten by subsequent inconsistent information. Loftus et al. indicated that after

receiving misleading information, the memory trace could no longer exist in its original form. However, studies such as the reversed suggestion design (Lindsay & Johnson, 1989b), in which the misinformation is presented before the correct information and false memories are still produced, have demonstrated that the overwriting hypothesis is not a viable description of false memory formation.

### Blended memories

The concept of blended memories was suggested by Melcalfe (1990), who used CHARM (composite holographic associative recall model) to explain false memory development. In this theory, the memory traces for the original memory and the misinformation are blended in order to create a single memory trace which is an 'average' of the previous two events. Pohl and Gawlick (1995) also investigated the idea of blended memories. They found some evidence for blended memories in very specific situations. For instance, in situations where participants in misinformation studies have a very strong memory for the original information (because of repeated exposure), the likelihood of developing false memory is low. However, when participants do develop false memories, they may blend together memories for the misinformation and original information to form some sort of composite memory. When original memory traces are weaker, participants accept misinformation as the sole source of recollection. Ayers and Reder (1998) criticise this model as it does not account for the fact that memory impairment in misinformation studies tends to diminish over time.

Studies examining laboratory implanted false memories tend to replace existing memories with new ones, whilst autobiographical false memories generally involve creation of false memories where a memory did not previously exist. Given this information, there is doubt as to whether the alteration or impairment theories could adequately explain the effect of false autobiographical memories. One possible way of fitting the data to a single-trace theory would be by taking the position that the lack of previous memory has been altered or impaired by the creation of a new memory. However, it is generally agreed that single-trace theories are no longer able to adequately explain the creation of false memories (Ayers & Reder, 1998).

### *Multiple-trace theories*

The term 'multiple-trace' describes the idea that each memory may be represented by more than one memory trace. False memories are, therefore, developed when there is confusion as to which of the memory traces are accurate.

### Blocking

The 'blocking' account of false memory development was suggested by Bekerian and Bowers (1983). Although it is a multiple-trace theory, it is closely related to single-trace theories. The account suggests that traces for the original event and misleading information exist in the memory, but the misleading information 'blocks' access to the original memory trace. Bekerian and Bowers (1983) suggest that the most recent information encountered blocks the earlier traces. Ayers and Reder (1998) indicate that this account was originally supported by some studies; however, the blocking theory is unable to account for the results of the reversed suggestion designs in which memory traces are affected by previously presented information.

### Source monitoring

Lindsay and Johnson (1987) proposed that false memories occur as a result of low source monitoring (i.e. the ability to identify sources of information). They suggest that source confusion is caused by not being able to access the original source of information (either because it has not been encoded, or it has been forgotten) or because participants respond to familiar items. Koriat, Goldsmith and Pansky (2000) summarise other mechanisms that may contribute to source confusions. These include the original information being ambiguous or incomplete; lack of focus when attributing items to sources (due to emotional responses and divided attention, for example); similarity between sources; repeated retrieval of imagined events; and distraction during the testing procedure. This concept was supported by Lindsay and Johnson's (1989b) study in which participants were asked to actively try and retrieve the source of their memory before responding to test items. They found that this technique caused an increase in accuracy, with fewer false memories being reported. Tomes and Katz (1997) also

subscribe to this explanation of false memory development. They state that separate memories are stored for the original event and misinformation, and that false memories occur when there is confusion between the two memory traces.

The source monitoring hypothesis is directly related to a field of research concerning reality monitoring. Johnson and Raye (1981) describe the term of 'reality monitoring' as referring to "the process of distinguishing a past perception from a past act of imagination, both of which resulted in memories" (p. 67). They suggest that false memories occur as a result of an inability to monitor reality adequately, and therefore being unable to distinguish between reality and imagination. Johnson, Foley, Suengas and Raye (1988) indicated that reality monitoring may fail for two possible reasons. Firstly, a memory may not have the usual characteristics that would indicate its source (for instance, if an imagination was particularly vivid). Secondly, the individual may not employ the usual process of reasoning on the basis of prior knowledge, or that reasoning may be faulty.

Ayers and Reder (1998) comment that source monitoring was not forwarded as a structural model of memory. Rather, it is a description of memory and behaviour in some cases according to the particular task demands, and therefore complements other theories of false memory development.

#### Hyman and Kleinknecht's three processes theory (1999)

Hyman and Kleinknecht (1999) proposed a theory of false memory development centred around the interaction between three processes. The first of these processes is plausibility judgments made about new information being received. Individuals are more inclined to judge events as plausible if they are both generally likely and personally likely. Hyman and Kleinknecht suggest that people will assess the overall frequency of particular events taking place, and the likelihood that they will experience them. Additionally, if an individual belongs to a group of people reporting a particular event, the event will seem more plausible. Another factor which increases plausibility is imagining a particular event. The idea that plausibility is influential in false memory

development is supported by Loftus, Levidow and Duensing's (1992) discrepancy detection hypothesis. In this, they suggest that the likelihood of a false memory being developed (in misinformation studies) is negatively correlated with the likelihood of detecting a discrepancy between the misinformation and the original event. In addition, Pedzek, Finger and Hodge (1997) report that although false memories can be developed for implausible events, the implantation of memories is more successful when the events are plausible.

The second process involved in the theory of false memory development is memory construction. Hyman and Kleinknecht (1999) indicate that memory is constructed by integrating schematic knowledge of situations with a combination of personal experiences, suggestion and current situational demands. They suggest that construction of new memories can be assisted by tying the event to existing self-knowledge, and encouraging individuals to describe the event.

The final process involved in Hyman and Kleinknecht's theory is that of source monitoring errors. They report that these are created by situational demands, and can be increased over time, and memory for the source of information fades faster than the content of the information. Hyman and Kleinknecht (1999) suggest that the three factors work together to produce false memory, and this may be a linear or interactive process.

#### Source activation confusion model (SAC)

The SAC model was developed by Reder and Schunn (1996) and used by Ayers and Reder (1998) as a model to explain the development of false memories in misinformation studies. It seems possible that the functions described in the SAC model could also generalise to describe the development of false memory by imagination inflation. The model assumes that the memory exists as a network of connected pieces of information. Each new concept is represented as an individual item in the memory, and the representation of that concept becomes weaker or stronger according to how often it is encountered. Concepts that are encountered relatively rarely will have weak representations in the memory, while frequently encountered concepts will be strongly

represented. In addition, as concepts are encountered and stored, associations to contextual features are automatically created. Concepts become active in the memory through direct encounters and if related contextual features are activated. Memories and actions are affected by whether particular concepts are active, regardless of how the concepts were activated and whether the individual is aware of the activation. Ayers and Reder (1998) posit that memory errors are produced when the source of a concept's activation is misattributed. For example (using the stop/yield sign study of Loftus, Miller & Burns, 1978) a concept of a traffic sign would exist in the memory. During the course of the misinformation study, two separate memory traces would be formed – one for a 'stop' sign, and one for a 'yield' sign. The response that would be provided by participants would be the trace with the greater activation at the time of testing. Given that the 'yield' trace has been produced more recently, that trace would be expected to be more active, and participants will therefore remember that as the correct sign.

Mitchell and Zaragoza (1996 a, b) and Roediger et al. (1996) demonstrated that repeating the misleading suggestions in misinformation studies increases the likelihood of developing false memories. This is consistent with the SAC model, as repeating the misinformation would make the memory trace to the misinformation more active, and therefore more accessible, than the original information trace.

Ayers and Reder (1998) point out that the SAC model is consistent with both the source monitoring and the strategic effects accounts of false memory development. Both of these accounts indicate that false memories are produced when the original memory source is, in some way, inaccessible and the false memory source is dominant.

#### Fuzzy trace theory (FTT)

A final proposed explanation for false memory development is the fuzzy trace theory (Brainerd, Reyna, & Poole, 2000). This theory has been proposed to account for both spontaneous false memories and implanted false memories. Brainerd et al. indicate that two specific memory traces are stored after any event. The first of these is a verbatim trace that exactly represents the main features of the situation. The second trace is a gist

trace which incorporates a summary of the events without any specific information. These two traces are stored in parallel in the memory. When individuals attempt to access information about the primary action in an event, the verbatim trace will be accessed. However, the gist trace will be consulted when information is needed about peripheral details of the situation. Gist traces tend to rely more on schematic information about events, rather than the specific information of one individual event.

When tested on items in memory, Brainerd et al. report that participants will have two subjective responses. Either they will have a feeling of remembering an event, which involves strong recollection, or they will have a general feeling of familiarity for the circumstances, and a feeling that they know the response without remembering the specific situation. The former feeling is associated with retrieval of verbatim traces from memory, and the latter is associated with retrieval of gist traces. False memories and memory errors occur when participants mistakenly attribute a feeling of remembering an event to a gist trace. This problem is compounded because verbatim traces become inaccessible more rapidly than gist traces, so individuals increasingly rely on gist traces for specific event information.

It can be seen that the final four accounts of false memory development described (source monitoring, Hyman and Kleinknecht (1999), SAC and FTT) are not necessarily mutually exclusive. Instead, they each describe different aspects of a similar model. It can, perhaps, be concluded that false memories develop as a result of source confusion and inaccessibility of original memory traces.

### **False memory over time**

It is now commonly accepted that memory is not a process in which events are reproduced perfectly without elaboration or distortion. Barclay (1986) describes memory as a reconstructive process, in which recollections are formed according to schema which exist to facilitate storage of routine and mundane events. Therefore, although the main themes of an event will be remembered, the exact details will be distorted over time and according to the situation in which they are being remembered.



Barclay states that the schema developed to aid memory storage are dependent upon past processing of similar situations, and thus schemata are heavily influenced by the attitude which the percipient has towards the events. McClelland (1995) suggests that remembering is a constructive process which is simultaneously affected by traces of the event being remembered, by background knowledge of material which may be related to the event and also by the influences of the situation in which the event is being retrieved.

Several examples of situations in which the current situation affects memory for an event are provided by Dawes (2001). He describes various studies which demonstrate that recollections are made from the perspective of the time of recollection, rather than the time of experiencing the event. For example, participants who are asked to evaluate the behaviour of a child that has previously been observed will alter their evaluations on the basis of new information provided after the observation period. The current situation not only affects recall of the behaviour of others but also of self. Dawes (2001) describes a study (Lewinsohn & Rosenbaum, 1987) in which participants' memories of their childhood were collected over a substantial period of time. When participants in the study were going through periods of depression, they rated their childhoods as significantly less happy than when they were not depressed. Dawes cites further studies indicating that current status affects memories of drinking behaviour, political attitudes, child rearing and stress. These findings are congruent with those of Mineka and Nugent (1995) who report the effect of several mood states on memory accuracy. This phenomena is known as 'hindsight bias' and Pohl and Gawlick (1995) suggest that it is closely related to misinformation, as both occurrences involve impaired recollection of events as a result of subsequent information.

Thus, memory has been seen to be dependent on the situation in which it is being tested. However, it is interesting to consider whether distortions of memory have a long-term effect on the accuracy of the memory, if the accuracy is entirely dependent on current mood state. Wiseman and Lamont (1996) examined several descriptions of the Indian Rope Trick published with a variety of time gaps between viewing and publication.

They found that descriptions of the event become systematically more impressive with the passage of time. The effect of memory distortion becoming larger over time has been explained to some extent as being due to repeated retrieval from memory (Roediger, Jacoby, & McDermott, 1996). They presented participants with a series of slides depicting a crime, then a misleading narrative about the events. Participants were then repeatedly tested on the event. Over time they produced more wrong details and were confident of their answers. Roediger et al. state that each time an event is retrieved from memory it is elaborated upon, and repeated retrieval causes greater distortion. They also suggest that each time a memory is recalled, the recollection is for the most recent account provided, rather than for the original event. Additionally, there is evidence to suggest that the time delay between the event and recollection is key in determining the level of distortion that occurs. Schmolck, Buffalo and Squire (2000), reviewing the literature, indicate that serious distortion of memory starts to occur after at least one year. Three days after the verdict in the O. J. Simpson murder trial, Schmolck et al. asked participants to record how they had heard the news. They found that after a period of 15 months, the majority of memories were generally accurate. However, after 32 months over two thirds of recollections were inaccurate in varying degrees, with people distorting where they were, what they were doing and who told them the news. It is worth noting that memories for extraordinary events (flashbulb memories) are commonly believed to be more accurate and durable than those for mundane events (Bohannon & Symons, 1992). Certainly this would be predicted given the notion of a schema-driven constructive memory that recreates situations based, to some extent, on their familiarity and similarity to previous experiences. However, Schmolck et al. (2000) state that up to forty percent of flashbulb memories contain major inaccuracies. This is due, in part, to source confusion created by media reports (in the case of events such as the Challenger disaster and the Kennedy assassination) and also the emotional impact of the situation. Therefore, it appears that both mundane and extraordinary events are equally susceptible to false memory development and memory distortion over time.

### **Individual differences in false memory development**

A number of studies have been conducted concerning the cognitive differences between participants who are and are not susceptible to false memory generation. Loftus, Levidow and Duensing (1992) found that artists and architects were more susceptible to suggestion than the general population. They speculated that this distinction may be caused by the imagery ability of artistic people. If a person can imagine very clearly an image which is being suggested to them, confusion will result as to the source of the remembered image. Dobson and Markham (1993) measured vividness of visual imagery in participants in a misinformation study, and found that individuals with high levels of visual imagery were poorer at discriminating the source of misinformation than those with low levels of visual imagery.

The extent to which an individual is hypnotisable has been found to correlate with false memory in a number of studies. For example, Barnier and McConkey (1992) presented participants with a series of slides and then hypnotised participants and gave misleading suggestions about the images in the slides. Participants who were highly hypnotisable were more accepting of the misinformation than those with low levels of hypnotisability. Barnier and McConkey (1992) also considered whether the factor of absorption (the extent to which an individual becomes involved in thought processes and experiences) is related to false memory susceptibility, but found no correlation.

Tomes and Katz (1997) presented participants with three separate events involving misinformation, in order to identify people with an habitual susceptibility to misinformation and suggestibility. This is, perhaps, a more reliable means of assessing the individual differences of those susceptible to false memory than relying on their performance in one particular study. They found that habitual susceptibility to misinformation is correlated with poor memory for items not affected by misinformation, vivid visual imagery, spatial dexterity and emotional empathy for others. In addition, Oakes and Hyman (2000) report work by Hyman that found that an individual's susceptibility to false memory could be predicted by responses in their initial interviews. People who talked about related self-knowledge were more likely to

develop false memories. Oakes and Hyman construe this to mean that false memories are constructed by combining false ideas with actual events from the past.

Hyman and Billings (1998) examined the relationship between a number of cognitive variables and susceptibility to false memory. They hypothesised that creative imagination, absorption, and dissociation should all correlate with false memory generation because they are all linked to hypnotisability and mental imagery, which have previously been demonstrated to predict susceptibility to false memory. They also predicted that social desirability (willingness to provide a socially acceptable response and win approval) would be related to false memory. The measure of false memory used by Hyman and Billings was that of false memory created as a result of source confusion, rather than misinformation. This is an interesting distinction because most studies examining the individual differences of false memory creators tend to use memories created as a result of misinformation. The results showed support for the notion that creative imagination and dissociation are correlated with false memory, but there was no relationship between false memory and either absorption or social desirability. Hyman and Billings suggest that the relationship between false memory and dissociation is indicative of the tendency of dissociative people to integrate external information into their memories. They further conclude that people with dissociative tendencies may use less stringent means to monitor reality, thereby creating confusion as to the nature of their memories. The creative imagination scale used by Hyman and Billings measures both imagery and hypnotisability, and the authors conclude that the correlation with false memory may be caused by either of these factors, or a combination of the two.

Platt, Lacey, Iobst and Finkleman (1998) also assessed the possible relationships between false memory, absorption and dissociation. They also considered whether fantasy proneness was a factor in determining susceptibility to false memory. They suggested that this might be the case as high scorers on fantasy proneness measures typically have difficulty differentiating between real and fantasy events. The authors considered two types of false memory – errors in autobiographical memory as a result of source confusion, and susceptibility to false memories generated using the word list

procedure of Roediger and McDermott (1995). Platt et al. report that autobiographical memory error is significantly correlated with absorption, as participants with higher absorption levels were less accurate. However, autobiographical memory error was not correlated with either dissociation or absorption, and word list error did not correlate with any of the three individual differences measures.

The use of the word list paradigm to assess individual differences in false memory was initiated by Winograd, Peluso and Glover (1998; cited in Platt et al., 1998). Winograd et al. predicted and found a correlation between false memory and dissociative experiences scores.

Therefore, it appears that there is a reasonably strong case for visual imagery and hypnotisability being more evident in individuals susceptible to false memory generation. There is also some evidence that dissociation is linked to false memory susceptibility, and also perhaps absorption.

## **BELIEF IN THE PARANORMAL**

### **Differing cognitive processes**

A great deal of research has been conducted examining the possible cognitive differences between paranormal believers and disbelievers. This work has resulted in a wide variety of possible differences being examined, and a compelling case exists for the view that the two groups are cognitively distinct. Irwin (1993) suggested that this research is due to an underlying assumption by (mainly sceptical) researchers that believers are not just cognitively different from disbelievers, but are actually cognitively deficient. Irwin dubs this the 'cognitive deficits hypothesis' and continues "Under this collective view, the believer in the paranormal is held variously to be illogical, irrational, credulous, uncritical, and foolish" (p. 16).

Snel, van der Sijde, and Wiegant (1995) investigated whether a relationship exists between belief in the paranormal and field dependency. Field dependency is manifested

in a need for structure in information being presented. People with high field dependency find it difficult to separate unimportant and important information and require context to interpret data. In contrast, field independent people can structure information by themselves, do not need context to make sense of information and are analytical. Snel et al. found the predicted positive correlation between paranormal belief and field dependency, and concluded that paranormal believers will, therefore, interpret anomalous phenomena in terms of the context in which it is presented. Disbelievers will look at phenomena as independent items separate from the context, and assess the data accordingly.

Thalbourne, Dunbar and Delin (1995) conducted a large survey investigating the cognitive and personality characteristics of paranormal believers. They found a strong correlation between paranormal belief and magical ideation, which they define as “a broad term defined negatively as a kind of thinking that conceives of various cause-effect relationships in terms that are at variance with, or contradict, naturalistic materialistic science” (p. 216). Examples of magical ideation include superstitious thinking and belief in concepts such as astrology and luckiness. Thalbourne et al. also found that belief correlated positively with neuroticism and dogmatism. This suggests that believers are both more emotionally unstable than disbelievers, and less likely to adjust their views in the face of persuasive evidence. This, however, contradicts the findings of Lester, Thinschmidt and Trautman (1987). They compared paranormal belief to results on a Jungian personality measure and found that believers were more likely to score highly on feeling, perceiving and intuiting, while disbelievers’ scores were for thinking, judging and sensing. Lester et al. conclude that believers are less logical but more open-minded than disbelievers. Finally, Thalbourne et al. (1995) replicated earlier findings that believers showed more of an external locus of control than disbelievers.

Although believers have been shown to have external loci of control and believe that events are largely controlled by external forces, they are also subject to the illusion of control. This was defined by French (1992b) as “a tendency for subjects to perceive random processes as being potentially under their control” (p. 296). A number of

researchers (e.g. Benassi, Sweeney, & Drevno, 1979; Jones, Russell, & Nickell, 1977) have demonstrated a strong interaction between illusion of control and belief in the paranormal. Blackmore and Troscianko (1985) tested this using a task which required subjects to attempt to influence the toss of a coin. This study revealed that participants who believed in the paranormal felt that they had far more control over the coin tosses than disbelievers did. Blackmore and Troscianko (1985) also found that believers were worse than disbelievers at probability judgment tasks and misjudged chance scoring by underestimating the level of scoring required by chance in ESP tasks. Blackmore and Troscianko suggested that this lack of understanding of chance may be the cause of the illusion of control – believers feel that they are performing well because they do not understand what would constitute a good performance. Additionally, Blackmore and Troscianko suggested that if believers do not understand the likelihood of coincidences, they will misinterpret entirely probable events as extraordinary.

Wierzbicki (1985) indicated that, in addition to a lack of understanding of probabilistic reasoning, believers also underperformed on syllogistic reasoning. However, Irwin (1991b) replicated this study and found no support for his hypothesis that the reasoning skills of paranormal believers are defective. He suggested that previous findings indicating that this is the case may be due to studies being conducted by sceptics. In particular, Irwin suggests that the scepticism of the investigator may have inhibited participants and prevented them from revealing the extent of their belief in the paranormal. This idea is disputed by Smith, Foster and Stovin (1998) who found no effect of context on intelligence scores of believers and disbelievers; however, the believers did score lower than the disbelievers in the intelligence test.

Roberts and Seager (1999) found a correlation between syllogistic reasoning and paranormal belief, but not between probabilistic reasoning and belief. Similarly, Blackmore (1997) conducted a newspaper survey with a large number of respondents and found no evidence of probability misjudgment on the part of believers.

Thalbourne and Nofi (1997) examined the possible relationship between paranormal belief and intelligence. They found no correlations between paranormal belief and intellectual or statistical ability. Believers were no more or less intelligent or statistically able than disbelievers.

Roe (1999) challenged the cognitive deficits hypothesis. He found no differences between believers and disbelievers on a critical thinking task. He suggested that (in line with Irwin, 1991b, 1993) previous studies suggesting cognitive deficits may have been affected by the scepticism of the experimenter. He also indicated that paranormal belief may have a social, rather than cognitive, foundation. This was supported by Irwin (1993) who proposed a model to describe the origins and functions of belief in paranormal phenomena. He suggested firstly that either encouragement of fantasy in childhood or traumatic childhood experiences, resulting in a need for a sense of control, may result in a strong level of fantasy proneness. This leads to paranormal belief, which allows an illusion of control over events. However, the degree of paranormal belief and the specific form that it takes will depend on the social context in which the belief is formed. Irwin proposes that there is an interaction between paranormal belief and experiences, as belief will cause ambiguous stimuli to be interpreted as paranormal, and the experiencing of unusual events will foster belief.

The literature reviewed thus far seems to suggest that, while there is support for Irwin's (1993) suggestion that sceptics conduct experiments in order to test the cognitive deficits hypothesis, there is considerable uncertainty as to whether believers are, in a variety of ways, cognitively inferior to disbelievers. However, work has been conducted that supports the idea that believers and disbelievers differ in terms of knowledge and cognitive processes. This literature appears to suggest that believers may actually benefit from more creativity, a richer imagination and a stronger sense of fantasy.

Haraldsson (1981) conducted a series of surveys examining the relationship between paranormal belief and various factors. He found strong and consistent correlations between level of paranormal belief and both recollection of dreams and the likelihood of



attempting to interpret the dreams. Haraldsson suggests that this reflects the greater tendency of believers to pay attention to their inner processes and also to attend to purely subjective experiences. Haraldsson's findings were supported by Irwin (1985) who also found correlations between belief and dream recall and interpretation. He further reported that believers in the paranormal were more likely to read about paranormal events and report personal experiences of psychic phenomena.

Irwin (1993) reports that paranormal believers have an external locus of control, while disbelievers tend to have an internal locus of control. This means that the believers attribute events to external forces such as other people, fate and luck, rather than believing that they have control over a situation. This reflects the work of (for example) Scheidt (1973), who found a strong correlation between belief in parapsychological and occult phenomena and external locus of control. This was also found by Allen and Lester (1994) in a survey of undergraduates. It is not clear, however, whether having an external locus of control is a consequence of paranormal belief, or whether the locus of control determines paranormal belief. It may be true that having an external locus of control is, in some cases, an advantage. For example, Dudley (1999a) reports that when participants were presented with an unsolvable puzzle, those with high belief in superstition and the paranormal were more able to recover and solve subsequent problems. Dudley suggests that in the situation of experiencing the unsolvable problem, the believers attributed the difficulty to external forces and this allowed them to move on without their performance being impaired. Disbelievers, however, would internalise the cause of the failure to solve the problem, causing disruption when attempting later questions.

Thalbourne (1995) conducted a survey examining different elements of belief. In this survey, he reports that belief in the paranormal correlated positively with scores on the Conceivability Scale, which measures the ability of participants to imagine specific unusual scenarios. Furthermore, the data indicated strong positive correlations between belief and creativity and belief and fantasy proneness. The latter finding supports research by Irwin (1990, 1991a) which has also demonstrated a link between paranormal

belief and fantasy proneness. Indeed, Irwin (1993) suggests that fantasy proneness is a vital component in the formation and maintenance of paranormal belief.

Similarly, Wiseman & Smith (1994) considered whether the differing reactions of believers and disbelievers to phenomena were caused by motivational factors (i.e. they interpret events in such a way as to confirm their existing beliefs) or cognitive factors (i.e. their interpretation of events is dependent on their cognitive capacity). Two studies were carried out in which participants were asked to assess a situation which may or may not have demonstrated evidence of paranormal or anomalous phenomena. In both cases, the believers made attributions of paranormal activity, and in both cases these attributions were caused by cognitive rather than motivational factors. The cognitive factor assessed by Wiseman and Smith was creativity, the implication being that believers are either more creative than disbelievers (this is also suggested by Thalbourne, 1995), or that they use their creativity differently than disbelievers.

Irwin (1993) conducted a wide-ranging review of the literature considering the differences between believers and disbelievers. He indicates that there is strong evidence that people with an existing belief in the paranormal will be more likely than disbelievers to actively seek out paranormal events and become involved in activities related to the paranormal. Examples of these are given as reading and watching television programmes about the paranormal, participating in parapsychology courses and attempting to have paranormal experiences. Sparks, Nelson and Campbell (1997) reported that exposure to particular programmes regularly depicting paranormal activity will result in an increased tendency to hold paranormal beliefs. Therefore, paranormal belief may be viewed as a circular process in which information which will strengthen and perpetuate the belief is actively sought. This view is supported by Clarke (1995) who conducted a survey considering the causes of belief and disbelief in the paranormal. He found that the single most persuasive factor in determining belief is personal experience, followed by the experiences of others and media reporting. Disbelief was determined by insufficient or unpersuasive evidence and by not having had anomalous experiences.

One area in which seeking out paranormal information may not increase existing paranormal belief is through attending parapsychology courses. Wesp and Montgomery (1998) indicate that being taught about the paranormal, and how to assess reports of paranormal experiences, increases critical thinking and scepticism. This was also found by Gray (1985) who found that a taught course in parapsychology reduces belief at the time, and this belief reduction is still evident up to a year later. Gray concludes that a determining factor in paranormal belief is basic ignorance concerning what constitutes reliable evidence. Gray and Mill (1990) extended this line of research by presenting graduate students with abstracts of scientific studies that were inadequate in terms of explaining how the studies were conducted, or that described studies which did not adequately test their hypotheses. The students' ability to recognise the flaws in the abstracts was assessed. The authors found that students with strong paranormal belief were significantly less likely to find errors than participants with little belief in the paranormal. Gray and Mill suggest that endorsement of paranormal phenomena may take place because individuals are not equipped with the knowledge to properly assess the situation.

It has therefore been demonstrated that, although believers in paranormal phenomena are not necessarily cognitively inferior to disbelievers, there is a strong case suggesting that cognitive differences do exist and these may affect the knowledge and behaviour of believers. Given that believers do demonstrate these cognitive differences, it is interesting to consider whether their behaviour is specific to belief in paranormal phenomena, or whether they are generally susceptible to believing unusual things.

Standing and Keays (1987) developed a measure of general gullibility, which involved assessing levels of belief in a variety of statements not related to the paranormal. They found that paranormal belief was positively correlated with this gullibility factor, suggesting that believers are simply more susceptible to accepting odd or unusual information. This finding is supported by Thalbourne and French's (1997) survey into the general beliefs of paranormal believers. They found that belief in ESP was correlated with belief in a number of non-paranormal extraordinary concepts, such as astrology and

UFOs. Roig, Bridges, Renner and Jackson (1998) also support this view, as they investigated whether there was a connection between paranormal belief and irrational thinking. In their measures, believers scored significantly higher than disbelievers on a global measure of irrational thinking. Additionally, the believers scored significantly higher than disbelievers on two specific subscales of the irrational thinking measure – worrying and rigidity.

This seeming tendency of believers in the paranormal to also believe in other unusual phenomena may be explained by Heard and Vyse's (1998-1999) finding. In a comparison of paranormal belief scores and authoritarianism/rebelliousness scores, they found a significant positive correlation. People that believe in the paranormal are more likely to yield to authority than disbelievers. It is, therefore, reasonable to assume that believers will be more likely than disbelievers to believe what they are told without questioning it.

## **PARANORMAL BELIEF AND FALSE MEMORY**

A small amount of research has been conducted examining the possible relationship between paranormal belief and various kinds of suggestibility. Haraldsson (1985) predicted and found a significant correlation between paranormal belief scores and scores on the Gudjonsson Suggestibility Scale (GSS) (Gudjonsson, 1984). The GSS assesses participants' tendency to respond to leading questions and change accounts of events as a response to pressure from an authority figure. Dafinoiu (1995) also found that paranormal belief was significantly correlated with suggestibility. This was measured in two ways; firstly a suggestibility questionnaire was administered, and secondly, participants were placed in a situation where they received a misleading suggestion about an event. Both forms of suggestibility were affected by paranormal belief, with believers showing more tendency to be suggestible than disbelievers.

With regard to hypnotic suggestibility, Saucer, Cahoon and Edmonds (1992) found no relationship between it and belief in the paranormal. However, Wagner and Ratzeburg

(1987) found a correlation between this factor and paranormal belief. They queried whether this would necessarily predict a correlation between waking-state suggestibility and belief, as there was no research indicating a relationship between the two forms of suggestibility. Despite this, they concluded that both types of suggestibility involve imagination and acceptance of phenomena suggested by other people, so a correlation between suggestibility and paranormal belief may exist. Atkinson (1994) found correlations between hypnotic susceptibility and both paranormal belief and reported paranormal experiences. He suggested that the correlation of hypnotic susceptibility and paranormal belief may be influenced by the fact that both variables are associated with absorption. Irwin (1989) reported that people who experience anomalous events exhibit a higher need for absorption than those not reporting anomalous experiences. Irwin suggests that the need for absorption may even cause the unusual experiences. Pekala, Kumar and Marcano (1995) also found a correlation between hypnotic susceptibility and paranormal belief and experiences. Additionally, they reported a relationship between experiencing of unusual phenomena and dissociative tendencies, and suggested that levels of dissociation are more predictive of anomalous experiences than hypnotic susceptibility.

The relationship between dissociation and paranormal belief and experience has been reasonably well documented in the literature. Richards (1991) found that subjective accounts of psychic and anomalous experiences are strongly correlated with dissociation scores. Irwin (1994) found that dissociative experience scores correlated with a global measure of paranormal belief and also the subscales of belief in psi and precognition. Makasovski and Irwin (1999) and Rattet and Bursik (2001) also report significant interactions between dissociative experiences scores and paranormal belief. Wolfradt (1997) extended the investigation using the Dissociative Experiences Scale (Carlson & Putnam, 1993). He identified two main factors on the scale and named these depersonalization/derealization and absorption/amnesia. The first factor concerns experiences such as a feeling of disconnection from the body, or lack of reality in the rest of the world. The second factor is connected with being unsure about whether certain events actually happened, and forgetting that actions have been performed. There

was no overall correlation between belief scores and dissociation, but individual paranormal belief subscales correlated with different factors on the DES. Specifically, Wolfradt found that the depersonalization/derealization factor correlated with paranormal belief subscales of witchcraft, precognition, spiritualism, superstition and religious belief. The absorption/amnesia factor was correlated with the psi belief, precognition and superstition subscales. Thus, the dissociative factor specifically associated with false memory development has been correlated with belief in psi.

A possible explanation for the relationships between paranormal belief and dissociation, absorption and suggestibility has been suggested by Thalbourne and Delin (1994). They identify a factor called transliminality which links paranormal belief, creativity, mystical experience and psychopathology. Thalbourne, Bartemucci, Delin, Fox and Nofi (1997) define transliminality as “susceptibility to, and awareness of, large volumes of imagery, ideation and affect – these phenomena being generated by subliminal, supraliminal and/or external input” (p. 327). It is suggested that there is a threshold between subliminal processes and supraliminal (conscious) processes which becomes blurred and allows more subliminal information than usual to enter the conscious mind. Certain personality types have more interaction between the subliminal and supraliminal processes, and thus exhibit higher levels of transliminality (Thalbourne & Delin, 1994). Transliminality has been shown to be correlated with dissociation (Thalbourne, 1998) and paranormal belief (Thalbourne, & Houran, 2000; cited in Lange, Thalbourne, Houran, & Storm, 2000). Although the relationship between transliminality and susceptibility to false memory has not previously been tested it is also anticipated that transliminality would correlate with the false memories as this is also affected by a blurring of subliminal and supraliminal processes.

There is, therefore, a certain amount of literature that would support the hypothesis of a link between paranormal belief and false memory. The concept that believers in the paranormal would be more susceptible to false memory than disbelievers was first tested comprehensively by Blackmore and Rose (1997). They suggested that situations in which psychic or paranormal experiences tend to occur are situations in which reality

and imagination may become confused. They suggest that such confusions cause people to misinterpret events as being paranormal and therefore develop false memories for what has taken place. Given that people experiencing and reporting paranormal events typically tend to be believers, Blackmore and Rose (1997) suggested that believers should show more of a tendency to generate false memory than disbelievers. Studies published by Blackmore and Rose (1997, and Rose & Blackmore, 2001) have consistently failed to show such an effect. However, the existing literature on the cognitive and behavioural differences between believers and disbelievers gives indications that such an effect should be present.

Blackmore and Rose (1997) proposed the link between the paranormal belief and susceptibility to false memory as a possible explanation for reports of paranormal events. Their suggestion is supported by the work of Russell and Jones (1980). They presented participants with articles that either validated the existence of ESP or suggested that it did not exist. Disbelievers in the paranormal did not show a bias in their recollection of the articles, remembering both types of article equally well. Participants with a belief in the paranormal had a tendency to remember the articles which supported ESP (and, therefore, their existing views) and have inaccurate memories of the articles that did not support ESP. This finding was also evident in the work of French (1992a), who found that participants with belief in the paranormal reported that ESP had been present in a study concerned with stereotypical responses. This belief persisted despite the fact that the participants had been informed of the true nature of the study. These studies show that paranormal believers appear to misinterpret data as it is being presented to them, and continue to hold a false memory of what they have seen. However, despite the fact that their memories of the events are false, the memories are not necessarily 'false memories' in the typical sense of the phrase, given that no distortion of memory has taken place. Instead, the believers are holding accurate memories of inaccurate perceptions.

## **FALSE MEMORY VERSUS FALSE PERCEPTION**

Research has indicated that misleading information has the ability to affect recollections of events. Studies have shown that this is true whether the misinformation is given before or after an event (Rantzen & Markham, 1992). It is interesting to consider whether suggestion only affects recollection of an event, or whether it can be used to influence perception of an event as it is taking place. If suggestion is given post-event, its effect will be in influencing the memory of that event. If a suggestion is given pre-event or during the event, it may influence perception of, and attention to, the event.

Perception is known to be a constructive process, whereby stimuli are interpreted not only by using sensory information but also by unconscious inferences determined by pre-existing knowledge and biases (Eysenck & Keane, 1995). Eysenck and Keane (1995) list the three main assumptions underlying constructivist theory. Firstly, perception is viewed as a constructive process, consisting of more than a simple pathway between stimulus and reception. Secondly, the sensory information received is used as a stimulus, which is then interpreted using existing knowledge, expectations and motivations. Finally, given the subjective nature of this processing, the resulting perception may occasionally be incorrect.

The effect of constructive processing influences the way that small stimuli are interpreted, but also affects the experiencing of major events and judgment of self and others. Fazio and Williams (1986) found that perceptions of candidate performance in televised debates during an election campaign were largely guided by pre-existing affiliations. Participants regarded their chosen candidate as having outperformed their opponent. This reflects work by Duck, Terry and Hogg (1998) which was also conducted during an election campaign and demonstrated that pre-existing political affiliations caused participants whose party lost an election to perceive the media as biased against their party, and other voters as gullible. Similarly, Vallone, Ross and Lepper (1986) found that, when viewing media reports of a massacre in Beirut, both pro-Israeli and pro-Arab participants rated the coverage as being biased against their



sides. The authors found that participants arrived at this view using two separate mechanisms. Firstly, they evaluated the overall fairness of the coverage badly because they disagreed with comments reflecting the other sides' views. Secondly, they misperceived and misremembered specific instances of the content of the footage, recalling more coverage being afforded to the opposing side. The authors also noted that the more knowledge the participant had, the more biased their perception was.

Walton and McKeown (2001) found that drivers who habitually speed tended to overestimate the speed of other drivers. The authors concluded that this instance of constructive perception was used to justify behaviour which may not otherwise be deemed acceptable. This is an example of constructive perception working as a defence mechanism, selectively interpreting stimuli in order to support a worldview (GinerSorolla & Chaiken, 1997). Another example of constructive perception working as a defence is found when people are asked to examine evidence that may or may not support their views. Chambliss and Garner (1996) report that, rather than neutrally reading a text and considering their beliefs afterwards, participants will use the information selectively as a means to construct an argument that maintains their opinions. This finding was supported by Biek, Wood and Chaiken (1996) who found that participants showing a strong fear of AIDS were likely to interpret data as supporting their views, and also rate information congruent with their attitudes as more acceptable than information that was not attitude-congruent. Their data also reflect those of Vallone et al. (1986), as they found that participants with less knowledge of the situation were less likely to be biased.

Perception is also affected by the cognitive state of the percipient at the time. Brown (1986) reports that a participant's mood at the time of completing a task will influence the attributions they make about their success on the task. Lucock, White, Peake and Morley (1998) found that participants who are in a state of high anxiety about their health are likely to perceive doctors as less reassuring than those in lower states of anxiety. This perceived difference continues over time, with reports one month later still reflecting the initial attitudes. Another example of cognitive bias in the health field was

found by Williamson, Gleaves and Lawson (1992). They reported that bulimic patients incorrectly rated their daily intake of calories as higher than the intakes of both normal eaters and clinically obese people.

An alternative explanation for the differing recollections of believers and disbelievers with regard to paranormal phenomena is that the error occurs at perception, rather than at recollection. There is a strong literature suggesting that believers in the paranormal may be subject to biases in perception as a result of constructive processing. Jones and Russell (1980) asked participants to watch a demonstration of an ESP test after first measuring their belief in the paranormal. When the test appeared to be successful (i.e. showed above-chance levels of card guessing), both the believers and the disbelievers reported it as such. However, when the test yielded results at chance, the believers continued to report that ESP had been demonstrated. Despite the fact that the concept of chance had been explained to them, the believers consistently perceived the test as having shown ESP. It is interesting to note that the reverse is not true – the disbelievers did not regard the successful trials as having been at chance levels. Thus, it appears that the effects of bias on perception are stronger for believers than disbelievers. The participants were also tested on their own ESP ability. Although there was no overall difference in ESP scores, after the demonstration the believers were more likely than the disbelievers to indicate that their trials had shown evidence of ESP. Again, their beliefs had influenced their perceptions of the events.

These findings are supported by Wiseman, Seager and Smith (1997), in a study involving the differing perceptions of believers and disbelievers in a séance room. They noted that the believers who attended the séances were more likely than disbelievers to report that objects had moved when they had, in fact, remained stationary; to report experiencing unusual phenomena in addition to those which the experimenters had arranged; and to rate the phenomena as being of a paranormal origin.

Blackmore and Moore (1994) suggested that a possible explanation for the greater number of paranormal experiences reported by believers is a tendency for them to

misinterpret neutral or noisy stimuli, and construct a perception of an anomalous event. They tested this idea by presenting believers and disbelievers with a series of images in progressive stages of degraded quality. In accordance with their hypothesis, they found that participants who believed in the paranormal were more likely than disbelievers to report seeing images in the stimuli, and their identifications were incorrect more often. This suggests that, in real-world situations, believers have a greater tendency to misinterpret events as being paranormal and also to experience events differently from how they actually happen.

Hines (1988) reports that this bias of paranormal believers towards unusual phenomena is not unusual, as it reflects the fact that anyone with a strong level of belief about a particular topic will construct their perception accordingly. He cites Glick and Snyder's (1986) study into astrology as an example of this. Participants were provided with an astrological reading for a particular individual and were asked to question him in order to establish whether or not the reading was accurate. Although there was no difference between believers and disbelievers in astrology in the questions that they asked (most tended to ask questions that would confirm the reading as accurate), they were affected differently by the answers received. After questioning the individual, disbelievers tended to modify their previous views on astrology and perceive the reading as being accurate. Believers rated the reading as accurate regardless of how many answers they had heard confirming facts about the reading. Hines (1988) interprets this result as showing that, in most situations, disbelievers are open-minded and prepared to change their views whilst believers are inclined to interpret all events as being congruent with their beliefs.

The tendency of people to selectively interpret data, and construct perceptions that are congruent with their world views is explained by Sanbonmatsu, Posvac, Kardes and Mantel (1998) as being due to selective hypothesis testing. They suggest that in situations where people have to make decisions about certain pieces of information, they will naturally be inclined to interpret the information as in accordance with their beliefs. This is achieved in two ways. Firstly, people will be selective about the hypotheses that they choose to test. Sanbonmatsu et al. (1998) indicate that it is common to avoid

situations in which beliefs and assumptions are challenged, therefore it is possible to retain attitudes that are incorrect or inconsistent. More hypotheses are generated that are consistent with existing attitudes and, therefore, more of these hypotheses are confirmed. Secondly, people will be selective in how they test attitudes and interpret findings. Sanbonmatsu et al. report that ambiguous or neutral stimuli are often perceived to be congruent with existing beliefs. Additionally, hypotheses are expanded or adjusted to accommodate information. When people are particularly motivated to support a particular hypothesis, they may lower their standards of confirmation in order to maintain their opinions. Hypotheses that are generated as a result of pre-existing ideas are often confirmed very quickly, as they are considered to be very credible and consistent with beliefs that have already been confirmed. Thus, in the situation of a strong believer in paranormal phenomena, the possibility of a ghost having been seen will be accepted relatively easily, because it is a concept that is in accordance with previous beliefs and possibly similar to previous events that have been experienced. In the case of a non-believer, the probability that the event was a ghost sighting would be tested much more rigorously, with alternative explanations being considered before the idea was accepted. Similarly, even if an hypothesis is not consistent with previous belief, acceptance will be much faster if the event takes place in a context where the hypothesis is plausible, and when there is encouragement from others for the hypothesis to be accepted. Given the higher likelihood of attitude-congruent hypotheses to be both tested and confirmed, it is also true that there is a higher likelihood that the confirmation will be false. Pre-existing beliefs cause an acceptance of ideas that would otherwise not be supported. In the field of the paranormal, it appears that believers have more of a tendency to selectively test hypotheses than disbelievers, causing misperceptions and misinterpretations of stimuli.

Given this information with regard to the constructive nature of perception, it seems probable that perception of an event will be affected by receiving misleading information before the event is viewed, or as the event is taking place. It also seems probable that acceptance of that information will be greater the more it corresponds to existing beliefs. This thesis, therefore, aims to test the effects of misleading information

before and during the viewing of an event on the perceptions of percipients. It also considers whether the acceptance of misleading information varies according to paranormal belief, and the correspondence between the information and existing beliefs.

## **STRUCTURE OF THESIS**

The first chapter has reviewed the existing literature on belief in the paranormal focusing particularly on the possible cognitive differences between believers and disbelievers. The literature on false memory has also been reviewed, and the theories of why false memories may develop have been considered. The individual differences between false memory developers and non-developers have been considered. The reasons for hypothesising a correlation between paranormal belief and development of false memory have been explained. It has also been suggested that differences in recollection between believers and disbelievers may be caused by error at the encoding stage, rather than the storage or retrieval stages.

Chapter 2 contains details of three studies examining false memory developed as a result of imagination inflation. This draws on work by Blackmore and Rose (1997, and Rose & Blackmore, 2001), and extends the concept to examine the correlations between false memory, paranormal belief, visual imagery, dissociation and transliminality. The studies were successful in generating false memories, but suggest that development of false memories through source confusion is not related to paranormal belief.

Chapter 3 examines whether pre-existing beliefs and expectations can affect the way in which participants experience unusual events. The studies found that participants with belief in ghosts were more likely to experience unusual phenomena in neutral situations than were participants with no belief in ghosts. The second study described in Chapter 3 also considers whether misleading suggestion before an event will influence perception of it, and whether believers will be more susceptible to the suggestion than disbelievers.

Chapter 4 considers the impact of pre-existing beliefs and misleading suggestion upon perceptions of events in a séance room. The study includes the unusual technique of negative suggestions (indicating that an event which is taking place is not happening) as well as suggestion that an event is taking place, and considers whether believers and disbelievers are equally susceptible to selective processing of information which challenges beliefs.

Chapter 5 details four studies examining false perception and false memories developed as a result of suggestion. These studies tested the notion that perceptions can be altered during the course of experiencing an event, and that suggestion does not simply rely on post-event misinformation. This implies that reports of paranormal phenomena may be reliant on factors other than the events that actually take place. The four studies indicate that perceptions of events can be influenced by preconceptions and beliefs; however, there is ambiguity about the interaction between belief and suggestion. The final two studies also consider the role of precise question wording in gaining accurate representations of participants' views.

Chapter 6 summarises the findings within the thesis and examines whether there is evidence for a relationship between paranormal belief and susceptibility to either false memory development or false perception. The chapter concludes by detailing potential areas for further study and considering the implications of the findings.

## ***CHAPTER 2: ASSESSING THE RELATIONSHIPS BETWEEN PARANORMAL BELIEF, DISSOCIATION, IMAGERY AND IMAGINATION INFLATION***

### ***INTRODUCTION***

#### **False memory research**

Researchers have demonstrated that it is possible to produce false memories using a variety of methods. For instance, some researchers have generated false memories in participants by implanting misleading post-event information (e.g., Loftus, Donders, Hoffman, & Schooler, 1989). An alternative approach is to produce false memories by confusing the source of the memories. Roediger and McDermott (1995) demonstrated that when exposed to a series of related words, participants will develop ‘memories’ for words that were not presented, but which are connected to the presented words. For example, when shown a list containing the words ‘seat, arm, cushion, rest’ participants will remember being shown the word ‘chair’. Source confusion was also tested by Goff and Roediger (1998), who examined whether the act of imagining an event could cause a false memory of having actually performed it. They reported that after being asked to perform a series of simple actions and imagine performing some actions, participants are unable to recall which actions were performed or imagined. It is suggested that the action of imagining an event leads to great familiarity with that event, and the participants confuse the source of this familiarity, leading them to believe that they have actually performed the action.

Lane and Zaragoza (1995) tested whether participants would confuse memories for printed words and pictures. They presented participants with a series of cards depicting individual words or a simple picture. The next day they were given a list of the cards viewed and were asked to indicate whether they had seen a picture or a word. They were also asked to state whether they remembered seeing the item, or if they just had a feeling of knowing that they had seen it. Lane and Zaragoza found that, although the majority of judgments were correct,

a significant number of participants made confusion errors as to the source of the memory. They concluded that participants who misremembered words as pictures often based their judgments on a conscious 'recollection' of what the picture looked like. They also found no difference between correct memories and source confusions with regard to remember/know judgments. Participants were unable to distinguish between the two forms of memory.

### **Interaction between false memory and paranormal belief**

Blackmore and Rose (1997) predicted a relationship between paranormal belief and the number of false memories generated through source confusion. This prediction was based on what they refer to as the 'misinterpretation hypothesis', suggesting that people who believe in the paranormal are more likely to confuse reality and imagination, and therefore misinterpret imagined events as real. This prediction is supported by several strands of research.

Within memory research it has been demonstrated that there is a strong correlation between development of false memories and dissociation (for example, Hyman, & Billings, 1998). Pekala, Kumar and Marcano (1995) report that definitions of dissociation range from the somewhat specific "disconnection, independence, or separateness of one part of memory from another" to the broader "disconnectedness or lack of integration of knowledge, identity, memory, and control" (p. 314). Hyman and Billings (1998) suggest that the correlation between dissociation and false memory may be explained by the fact that people who are highly dissociative are less able to monitor reality and are more likely to incorporate outside information into their own experiences.

There is also an established link between paranormal belief and proneness to dissociation. Irwin (1994) demonstrated that dissociation is positively and significantly correlated with global paranormal belief and also several individual subscales of the Paranormal Belief Scale. This is supported by both Makasovski and Irwin (1999) and Rattet and Bursik (2001) who



also report a correlation between paranormal belief and dissociation. Irwin (1994) suggests that this connection may actually be a consequence of the relationship between both factors and fantasy proneness, and that these are defence mechanisms used to cope with uncontrollable life events.

The relationship between paranormal belief and mental imagery has also been well explored. Irwin (1993) reports a positive correlation between mental imagery and paranormal belief, and Thalbourne (1995) found that those with strong paranormal belief score highly on the Conceivability Scale. This scale measures an individual's ability to imagine a certain object or scenario. Marks (1988) even states that 'many sincere believers in paranormal phenomena appear to base their beliefs on autonomous, vivid, hallucinatory images of a non-lucid kind.' (p. 333)

This information is particularly interesting in light of the fact that there is also an established connection between development of false memory and mental imagery. Hyman and Pentland (1996) demonstrated that guided imagery can increase the construction of false memories for childhood events and, in 1998, Hyman and Billings found a significant correlation between generation of false memory and scores on the Creative Imagination Scale, which measures the vividness of mental imagery. Tomes and Katz (1997) investigated the cognitive differences between participants who are and are not susceptible to false memory generation as a result of misinformation. They found a strong correlation between false memory susceptibility and scores on the vividness of visual imagery questionnaire (VVIQ) (Marks, 1973). This supports Dobson and Markham's (1993) finding that high scorers on the VVIQ are more likely to develop false memories after misinformation has been presented. Goff and Roediger (1998) provide an explanation for these findings, stating that good imagers make more source monitoring errors than poor imagers, thus leading to greater potential for false memory development.

One theoretical explanation for these relationships has been suggested by Thalbourne and Delin (1994). They report that there is a 'common thread' linking paranormal belief, creativity, mystical experience and psychopathology, and assign this factor the name 'transliminality'. It is suggested that there is a threshold between subliminal processes and supraliminal (conscious) processes which may become blurred in certain cases. In these instances, more subliminal information is allowed to enter the conscious mind. Thalbourne and Delin suggest that personality types that exhibit high levels of creativity, paranormal belief and certain forms of psychopathology (such as mania and schizophrenia) have more interaction between the subliminal and supraliminal processes, and thus exhibit higher levels of transliminality. This theory is directly applicable to the current study, supporting the hypothesis that there will be correlations between paranormal belief, visual imagery, dissociation and false memory. Each of these factors is associated with high levels of interaction between the subliminal and supraliminal processes.

Blackmore and Rose (1997) chose to concentrate on false memories generated as a result of confusing the source of the memory. In this research, participants were shown simple line drawings of various objects and asked to imagine others. Over several weeks, the participants were questioned about details of the pictures (e.g. 'Did the shoes have laces?'), although they were not asked whether the pictures were real or imagined until the final session. At the end of the study it was shown that participants had developed false memories for some of the pictures. That is, they incorrectly recalled that they had seen some pictures that had simply been imagined. However, Blackmore and Rose (1997) failed to find the predicted correlation between false memory and paranormal belief, and Rose and Blackmore (2001) detail three more, similar, studies which also carried the same prediction and again failed to find a relationship.

## **ESP testing**

Blackmore and Rose tested a second hypothesis within the course of their studies – the ‘reality-imagination psi hypothesis’. They suggested that creating a situation where reality and imagination are somehow confused may be psi-conducive. This is proposed as a possible alternative or complementary explanation for a link between paranormal belief and false memory, as they suggest that people who confuse reality and imagination may have more psychic experiences than other people as the confusion is somehow creating an opportunity for psi to occur. This hypothesis is linked to the ‘sheep-goat’ effect which has often been considered in parapsychology studies. This term refers to the fact that participants who demonstrate strong belief in the paranormal have a tendency to score higher than disbelievers in tests of ESP (Palmer, 1986a). Lawrence (1993) performed a meta-analysis of studies examining the sheep-goat effect between 1947 and 1993, and found that the effect was small but consistent. This indicates that, if ESP exists, participants who believe are more likely to experience it than those who do not believe. Thus, participants also completed a covert ESP test in the course of Blackmore and Rose’s studies.

ESP testing can be classified into two distinct forms – forced-choice tests and free-response tests (Broughton, 1991). In forced-choice testing, participants are aware of a specific number of pre-determined targets and they must attempt to identify which of those targets a particular stimulus corresponds to. For example, in card-guessing tasks participants are aware that each card must depict one of five possible symbols and they must guess which of those symbols is on the card. In free-response tasks, participants generate a description of a possible target, and then must decide which of a number of targets most closely corresponds to their description (Palmer, 1986b). The participants in Blackmore and Rose’s study were not aware that they were participating in an ESP test, and therefore could not consciously select targets. However, the task was more related to a forced-choice test than a free-response test. Blackmore and Rose indicated that if the participants experienced ESP during the studies, they would be more likely to develop false memories for pre-selected

target labels. Each participant was assigned a pack of ESP targets comprising three of the labels that they had been asked to imagine. A ‘hit’ was recorded when the participant reported a false memory that corresponded with one of the target pictures. A ‘miss’ was recorded when a false memory corresponded with one of the non-target pictures. Blackmore and Rose found in their 1997 study, but not the three 2001 studies, that participants developed significantly more false memories for objects that had been selected as ESP targets.

### **Confidence**

There is a consistent effect in false memory research that participants are significantly less confident in their false memories than their real memories. Pezdek and Taylor (2000) reviewed the existing research and found no studies within the false memory literature that indicated that participants were more confident in their false memories. This effect may be due to the fact that false memories are generally less vivid, less detailed and have less clarity (Porter, Yuille, & Lehman, 1999). However, Blackmore and Rose (1997) did not report this effect – they found that participants were as confident of their false memories as their actual memories.

### **The present studies**

The present studies build upon the work of Blackmore and Rose (1997) in four major ways. Firstly, the studies are designed to allow more false memories to develop and this has been achieved by increasing the number of pictures that the participants are asked to imagine from six to twelve. The presented pictures are complex photographs of familiar situations (such as an elephant in a zoo, a seal on a bed of ice) and the participants were therefore encouraged to imagine similar scenes that would also feel familiar. Research has shown that participants commonly distort memories of photographs such that they remember and describe more of a scene than is actually shown (Intraub, Gottesman, Willey, & Zuk, 1996). This phenomenon is known as ‘boundary extension’ and Intraub et al. (1996) explain its

occurrence as being caused by the natural tendency of participants to place scenes in a larger and familiar context. It was therefore anticipated that, by using complex images that the participants would naturally elaborate upon, the distinction between the actual photographs and imagined images would be blurred. The pictures presented are also linked conceptually, as they all involve photographs of animals. It has been shown that in situations where participants are asked to imagine some articles and view pictures of others, source confusion develops most often when the articles are linked around a conceptual theme (Henkel & Franklin, 1998).

Secondly, in a change to the Blackmore and Rose (1997) design, the participants were asked to provide a verbal description of each false memory that they developed as opposed to the Blackmore and Rose study where participants were asked to draw simple pictures. This allows collection of quantitative data and encourages the participants to think carefully about their responses. Thirdly, for reasons of time and practicality, participants were not tested on their recall between the first and last sessions. The fourth major change to the Blackmore and Rose paradigm is that participants' dissociative experiences and visual imagery were assessed, in order to explore the possible connection between these variables and development of false memories.

In addition to measuring the false memories developed by participants, the number of memory errors made in the opposite direction was also recorded. Instances where participants wrongly stated that they imagined a picture, rather than seeing it, were registered as 'forgetting' scores. Such instances are clearly source monitoring errors along the same lines as development of false memory, as participants are able to retrieve part of a picture but do not remember the origin of it (Schacter, Norman, & Koutstaal, 2000). Both forms of memory error could be classed as either constructive (in that they involve generating a new memory for the source of a picture) or destructive (as the participant has forgotten the original source of the picture). However, it is unclear whether forgetting

information is the exact equivalent of false memory generation, or whether it is the opposite. Consequently, it was predicted that forgetting scores would also correlate with the individual differences measures, but the direction of the correlations was not predicted. In addition, a general measure of memory inaccuracy was formed from adding together the number of false memory and forgetting scores, and it was also expected that this would correlate with the individual differences measures.

## ***STUDY 2.1***

### **METHOD**

#### **Design**

The study was a correlational design, in which the dependent variables were: number of false memories developed, forgetting scores, total memory inaccuracy, paranormal belief scores, vividness of visual imagery scores and dissociative experiences scores.

It was hypothesised that belief in the paranormal would significantly correlate with the number of false memories developed, forgetting scores and the total number of inaccurate responses. Furthermore, it was predicted that the number of false memories developed, forgetting scores, total inaccuracy, belief in the paranormal, dissociative experiences scores and vividness of visual imagery would all correlate with each other. Finally, following Blackmore and Rose (1997), it was predicted that participants would develop significantly more false memories for ESP targets than non-targets.

#### **Participants**

This study involved 16 University of Hertfordshire undergraduate students with a mean age of 22.4 years (std. dev. 4.83). 3 males and 13 females participated in the study, all of whom obtained course credits for doing so. All participants completed the task individually.

## **Materials**

### *Stimuli*

The stimulus materials used were 24 slides presented on the Slideshow option of Microsoft's PowerPoint package. Two sets of 24 slides were prepared, each containing 12 slides showing a colour photograph of an animal with the name printed underneath, and 12 slides showing only the name of an animal. The sets were counterbalanced such that each 'photograph and label' slide in Set 1 corresponded to a 'label only' slide in Set 2, and vice versa. Each slide was presented for 10 seconds, with a 2-second break between slides. The slides were presented so that every pair of slides contained a 'photograph and label' slide and a 'label only' slide; however the order of these pairs was randomly selected.

### *Practice Stimuli*

The Practice Stimuli consisted of 2 'photograph and label' slides and 2 'label only' slides which were randomly ordered.

### *Questionnaires*

#### Paranormal Belief Scale (see Appendix A)

The Paranormal Belief Scale (PBS) (Tobacyk & Milford, 1983) consists of 25 statements covering seven subscales of paranormal belief. Participants are asked to record their level of agreement with each statement using a scale ranging from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). The scale is scored by summing the ratings, taking note of the fact that two items on the scale are reverse scored. The mean score for the PBS is reported by the authors as 76.87 (std. dev. 11.97). An example of the statements is: 'A person's thoughts can influence the movement of a physical object'.

#### Dissociative Experiences Scale (see Appendix B)

The Dissociative Experiences Scale (DES) (Carlson & Putnam, 1993) consists of 28 scenarios demonstrating various levels of dissociation. Participants are asked to circle a

number from 0% to 100% (in increments of 10%) to show how often they experience each scenario. The scale is scored by generating a mean of all the responses. The median score for ‘normal’ participants (i.e. those without clinical diagnoses of psychiatric disorders) on the DES is reported by the authors as 4.38. A sample scenario is: ‘Some people find that sometimes they are listening to someone talk and they suddenly realise that they did not hear part or all of what was said. Circle a number to show what percentage of the time this happens to you’.

Vividness of Visual Imagery Questionnaire (see Appendix C)

The Vividness of Visual Imagery Questionnaire (VVIQ) (Marks, 1973) presents participants with 4 different scenes and asks them to imagine 4 specific details of each scene. Participants are asked to record the vividness of their imagery on a scale ranging from 1 (*Perfectly clear and as vivid as normal vision*) to 5 (*No image at all, you only ‘know’ you are thinking of the object*). The scale is scored by generating a mean of all the responses. The mean score for the VVIQ is reported by the author as 3.01 (standard deviation not provided). An example of an item on this scale is:

Think of the front of a shop which you often go to. Consider the picture that comes before your mind’s eye.

- a. The overall appearance of the shop from the opposite side of the road \_\_\_\_\_
- b. A window display including colors, shapes and details of individual items for sale \_\_\_\_\_
- c. You are near the entrance. The colour, shapes and details of the door \_\_\_\_\_
- d. You enter the shop and go to the counter. The counter assistant serves you. Money changes hands \_\_\_\_\_



The VVIQ is reverse scored – high scores on the scale indicate a poor level of imagery, while low scores indicate extremely good imagery.

#### Response Questionnaire (see Appendix D)

This was presented one week after viewing the stimuli and consisted of a list of the 24 labels. Participants are asked for each label to record whether the corresponding photograph had been *Seen* or *Imagined*. For each answer the participant rated their confidence on a 1-7 scale, ranging from *Not at all Confident* to *Very Confident*.

#### *ESP Target Pack*

Four ESP target packs were prepared by two people unconnected with the study. For each participant, six of the twelve ‘label only’ slides that they had seen acted as ESP targets. Colour photographs corresponding to the labels were printed with 6 targets on each sheet of paper. Each sheet of paper was then folded in half and wrapped in foil. These were then placed into separate envelopes, then wrapped in ‘Keepsafe’ bags (secure, tamperproof bags that cannot be opened without leaving evidence). The bags were labelled according to whether they contained the target pictures for Slide Set One or Slide Set Two. The author had no knowledge of which targets were in the envelopes. Participants were assigned one of the two envelopes corresponding to the set of stimuli that they viewed, and it was attached to the response questionnaire during the second session.

As with Blackmore and Rose (1997), a ‘hit’ was recorded when the participant reported a false memory that corresponded to one of the target pictures. A ‘miss’ was recorded when a false memory corresponded to one of the non-target pictures. At no time were the participants told that they were completing an ESP test.

## **Procedure**

Participants were recruited via a poster offering course credits for completion of the study. All participants were run by the author in both sessions. In the initial session, they were shown the 24 stimuli on a computer monitor. Before viewing the stimuli, the participants were instructed that when presented with 'photograph and label' slides they should concentrate on the photograph and take in as much detail as possible, and when presented with 'label only' slides they should imagine a photograph of the appropriate animal. Prior to seeing the slides, participants were shown the Practice Stimuli, to ensure that they understood the task. After viewing the Practice Stimuli and indicating that they understood, participants were shown the actual stimuli. After viewing the slides, participants completed the PBS, the DES and the VVIQ. There were no time restrictions.

Participants returned a week later for a second session. They were presented with the Response Questionnaire and asked to complete it; there was no time limit for this. Participants were deemed to have generated a false memory when they incorrectly stated that they had seen a photograph which had actually been imagined. For each false memory recorded, the experimenter tape-recorded the participant giving a verbal description of the photograph that they believed they had seen. In addition, participants were asked to describe a corresponding number of actual memories (i.e. memories for photographs that had actually been presented and that they recalled seeing).

## **RESULTS**

### **False memory**

The procedure was successful in terms of producing false memories. In total, 47 false memories were generated (mean of 2.9 per participant). Additionally, there were 33 occasions (mean of 2.06) in which participants 'forgot' that they had seen a photograph, and recorded it as an imagined event.

### Correlations with individual differences measures

As predicted, there was a significant correlation between the number of false memories generated and scores on the PBS. However, the number of false memories generated did not correlate with forgetting scores, or participants' performance on the DES or the VVIQ. Neither forgetting scores nor total inaccuracy scores correlated significantly with any of the variables.

There was no correlation between scores on the PBS and the DES or the VVIQ. As predicted, there was a correlation between scores on the VVIQ and the DES. The correlations between individual differences measures are shown in table 2.1.

	FM	FORGET	TOTAL INACCURATE	VVIQ	DES
FORGET	r = .14 p = .6				
VVIQ	r = .16 p = .54	r = .19 p = .47	r = .18 p = .48		
DES	r = -.39 p = .14	r = -.17 p = .51	r = -.30 p = .24	r = -.51 p = .05	
PBS	r = .52 p = .05	r = .09 p = .72	r = .44 p = .09	r = -.34 p = .19	r = -.13 p = .60

Table 2.1: Spearman's Correlation Coefficients between individual differences measures and memory, showing 2 tailed significance.

### ESP

There were no significant differences between the number of false memories created by ESP and non-ESP targets ( $t(15df) = -1.52, p(2t) = .15$ ).

### Confidence

The participant's confidence in their false memories (rated on a 7-point scale) gave a mean score of 4.66 (std. dev. 1.23) against a mean score of 5.63 (std. dev. .95) when rating their actual memories. These means were compared using Wilcoxon Matched-Pairs Signed-Ranks

Test and were shown to be significantly different ( $z = -2.84$ ,  $p (2t) = .004$ ). Participants were significantly less confident in their false memories than in their actual memories.

## **DISCUSSION OF STUDY 2.1**

This study proved to be successful both in terms of generating a good number of false memories, and in finding the correlation between false memory and belief in the paranormal. Whilst this was suggested by the literature, Blackmore and Rose (1997) did not find this correlation. The expected correlations between false memory and scores on the DES and VVIQ were not found, and there was also no significant relationship between PBS scores and scores on the DES and VVIQ. Unlike Blackmore and Rose, the participants were significantly less confident with their false memories than they were with their real memories. These results were unexpected, but could possibly be explained by the fact that the participant sample was very small. In view of this, a replication was attempted with a larger number of participants.

An interesting finding in Study 2.1 was that the two sets of target slides were not generating equal numbers of false memories. Target set one generated a mean of 3.88 false memories (std. dev. 1.13) per participant, and set two generated a mean of 2 false memories (std. dev. 1.77). These means were significantly different ( $t (14df) = 2.53$ ,  $p (2t) = .02$ ). Consequently, it was decided to re-order the target sets into two new sets, each containing half of the slides with high numbers of false memories associated with them, and half of the slides associated with low numbers of false memories.

## ***STUDY 2.2***

The aim of Study 2.2 was to produce a replication of Study 2.1 using a higher number of participants and more equally balanced sets of slides.

### **METHOD**

#### **Design**

The study was a correlational design, in which the dependent variables were: number of false memories developed, forgetting scores, total inaccuracy scores, paranormal belief scores, vividness of visual imagery scores and dissociative experiences scores.

It was hypothesised that, as with Study 2.1, belief in the paranormal would significantly correlate with the number of false memories developed, forgetting scores and total inaccuracy scores. Furthermore, it was predicted that the number of false memories developed, forgetting scores, total inaccuracy scores, belief in the paranormal, dissociative experiences scores and vividness of visual imagery would all correlate with each other. Finally, following Blackmore and Rose (1997), it was predicted that participants would develop significantly more false memories for ESP targets than non-targets.

#### **Participants**

The second study involved 52 University of Hertfordshire undergraduate students with a mean age of 25.4 years (std. dev. 7.66). 11 males and 41 females participated in the study, all of whom obtained course credits.

## **Materials**

The materials used in Study 2.1 were also used in this study; however the two sets of slides were re-ordered to ensure that they contained equal numbers of slides which produced high numbers of false memories, and the ESP target packs were recreated accordingly.

## **Procedure**

The procedure was identical to that used in Study 2.1.

## **RESULTS**

### **False memory**

175 false memories were generated (a mean of 3.4 false memories per participant). 123 forgetting errors were made (a mean of 2.37 per participant). Set One of the slides generated a mean of 3.42 false memories (std. dev. 1.82) and Set Two generated a mean of 3.31 (std. dev. 2.49). There was no significant difference between the two means ( $t(50df) = .19, p(2t) = .85$ ).

### **Correlations with individual differences measures**

The number of false memories generated did not correlate with forgetting scores or performance on the PBS, the VVIQ or the DES. There was, however, a significant correlation between paranormal belief and VVIQ and DES. Additionally, there were correlations approaching significance between false memory and DES, and forgetting scores and PBS scores. These data are shown in table 2.2.

	FM	FORGET	TOTAL INACCURATE	VVIQ	DES
FORGET	r = -.01 p = .96				
VVIQ	r = .08 p = .56	r = .03 p = .81	r = .14 p = .31		
DES	r = -.25 p = .08	r = -.09 p = .49	r = -.22 p = .12	r = -.13 p = .36	
PBS	r = .19 p = .17	r = -.24 p = .09	r = .01 p = .93	r = .37 p = .01	r = .31 p = .02

Table 2.2: Spearman's Correlation Coefficients between individual differences measures and memory, showing 2 tailed significance.

## ESP

There was no significant difference between the number of false memories created by ESP and non-ESP targets ( $t(53df) = -1.56$ ,  $p(2t) = .12$ ).

## Confidence

The participants' confidence in their false memories (rated on a 7-point scale) was given a mean rating of 4.38 (std. dev. 1.29), and the confidence for real memories received a mean rating of 5.43 (std. dev. 1.37). These two ratings were compared using a Wilcoxon Matched-Pairs Signed-Ranks Test and this was shown to be significantly different ( $z = -4.37$ ,  $p(2t) = .001$ ). Participants were significantly less confident in their false memories than in their actual memories.

## DISCUSSION OF STUDY 2

As with Study 2.1, Study 2.2 demonstrated that the technique is successful in terms of generating false memories. However, whilst these memories score in the top half of the confidence ratings (slightly above 'uncertain'), they are significantly less confidently held than the participants' actual memories. The number of false memories generated did not

correlate with belief in the paranormal, although paranormal belief was correlated with the other individual differences measures. It is worth mentioning that, as the VVIQ is reverse scored (high scores indicate low levels of visual imagery), this correlation is in the opposite direction to the predicted correlation. The correlation approaching significance between false memory and dissociation is also in the opposite direction to that predicted. It is worth noting that the participant sample for both Studies 2.1 and 2.2 consisted of a very narrow range of individuals – all were undergraduate psychology students. It is possible that this may have contributed to the uncertain results as their performance may not generalise to that of the general population.

The results from Studies 2.1 and 2.2 fail to provide clear support for Blackmore and Rose's (1997) misinterpretation hypothesis which suggests that those who believe in the paranormal will experience more false memories than those who do not. The data concerning links between the various individual differences measures are also somewhat confused. As a result of this uncertainty, a third study using the same method of producing false memories was carried out. This study introduced a further individual differences measure – the revised Transliminality Scale (Lange, Thalbourne, Houran, & Storm, 2000). This scale measures a number of factors including absorption, fantasy-proneness, magical ideation, and creativity. It is hoped that the introduction of this scale will assist in clarifying the various interactions being investigated, and will provide support for the use of transliminality as a justification for Blackmore and Rose's misinterpretation hypothesis.

### ***STUDY 2.3***

The aim of Study 2.3 was to attempt to clarify the results previously obtained in Studies 2.1 and 2.2, by use of the Transliminality Scale. Thalbourne, Bartemucci, Delin, Fox and Nofi (1997) defined the construct of transliminality as “susceptibility to, and awareness of, large volumes of imagery, ideation and affect – these phenomena being generated by



subliminal, supraliminal and/or external input” (p. 327). People with high transliminality scores will experience a large amount of material moving between conscious and unconscious awareness. Translinality has been shown to be correlated with dissociation (Thalbourne, 1998), paranormal belief (Thalbourne, & Houran, 2000; cited in Lange et al. 2000), and imagery (Lange et al. 2000), and, as such, it was anticipated that scores on the Translinality Scale would significantly correlate with scores on the PBS, the DES and the VVIQ. It was also anticipated that translinality would correlate with the number of false memories generated, although the relationship between translinality and susceptibility to false memory has not previously been tested.

In addition to the introduction of the Translinality Scale, Study 2.3 differed from the previous two studies in two key areas. Firstly, no ESP test was conducted. This was for two reasons; on a practical level, participation in the study was carried out in large groups, which would have made distribution and separation of the ESP targets difficult; and, given the lack of ESP success evident in the previous studies, it was decided that the ESP task was not a productive avenue to explore. The second key difference in the present study was that participants were not undergraduate psychology students. It was hoped that using participants who were not accustomed to participating in psychology experiments, and had more life experience, would provide data that gave clearer results and was more generalisable to the population.

## **METHOD**

### **Design**

The study was a correlational design, in which the dependent variables were: number of false memories developed, forgetting scores, total inaccuracy scores, paranormal belief scores, vividness of visual imagery scores, translinality scores and dissociative experiences scores.

As with the previous two studies, it was hypothesised that there would be a significant correlation between belief in the paranormal and the number of false memories developed, total inaccuracy scores and forgetting scores. It was also predicted that belief in the paranormal, the number of false memories developed, forgetting scores, dissociative experiences scores, transliminality scores and vividness of visual imagery would all correlate with each other.

### **Participants**

64 people attending adult education classes participated in the first session. 53 returned to complete the study (return rate of 83%). The mean age of those who returned was 56.3 years (std. dev. 8.55). Eleven males and 42 females returned.

### **Materials**

The materials used in Studies 2.1 and 2.2 were also used in this study. However, no ESP test was conducted. In addition, the Revised Transliminality Scale was administered.

#### Revised Transliminality Scale (see Appendix E)

The Revised Transliminality Scale (RTS) (Lange et al., 2000) consists of 17 statements covering items such as dream interpretation, fantasy-proneness and absorption. Participants are asked to record whether each statement is true or false in relation to themselves. The scale is scored by assigning a score of '1' to each item marked 'true'. The total number of true items is then converted into a Rasch scaled score, which is used in statistical analysis. The mean Rasch score is given as 25.0 (std. dev. 5.0). An example of the statements is: 'I can clearly feel again in my imagination such things as: the feeling of a gentle breeze, warm sand under bare feet; the softness of fur, cool grass, the warmth of the sun and the smell of freshly cut grass'.

## **Procedure**

The participants were recruited from 5 adult education classes and were run in their class groups. In the initial session, the classes were shown the 24 stimuli on a computer monitor. Before viewing the stimuli, the participants were instructed that when presented with 'photograph and label' slides they should concentrate on the photograph and take in as much detail as possible, and when presented with 'label only' slides they should imagine a photograph of the appropriate animal. Prior to seeing the slides, participants were shown the Practice Stimuli, to ensure that they understood the task. After viewing the Practice Stimuli and indicating that they understood, participants were shown the actual stimuli. After viewing the slides, participants completed the PBS, the DES, the RTS and the VVIQ. There were no time restrictions, but participants were asked to fill out the questionnaires individually, and not to discuss the slides that they saw.

The following week, participants were again run in their class groups. They were presented with the Response Questionnaire and asked to complete it; there was no time limit for this. They were asked to ensure that they completed the questionnaires individually and did not discuss their answers with anyone else. After the questionnaires were collected, the aims of the study were explained.

## **RESULTS**

### **False memory**

167 false memories were generated (a mean of 3.2 false memories per participant). 175 forgetting errors were made (a mean of 3.3 per participant). Set One of the slides generated a mean of 3 false memories (std. dev. 2.05) and Set Two generated a mean of 3.24 (std. dev. 2.12). There was no significant difference between the two means ( $t(51df) = -.41, p(2t) = .68$ ).

## Correlations with individual differences measures

The number of false memories generated did not correlate with performance on the PBS, the VVIQ, the RTS or the DES. Paranormal belief did significantly correlate with VVIQ and transliminality scores. Transliminality also correlated with VVIQ and DES. There were, additionally, correlations approaching significance between PBS and DES, and PBS and forgetting scores. All significant correlations are in the expected direction. These results are shown in table 2.3.

	FM	FORGET	TOTAL INACCURATE	VVIQ	DES	RTS
FORGET	r = .02 p = .9					
VVIQ	r = .02 p = .91	r = -.02 p = .91	r = -.01 p = .98			
DES	r = -.03 p = .84	r = .1 p = .49	r = .08 p = .56	r = -.22 p = .11		
RTS	r = -.1 p = .45	r = -.14 p = .32	r = -.16 p = .26	r = -.53 p = .0001	r = .64 p = .0001	
PBS	r = -.07 p = .62	r = -.24 p = .08	r = -.24 p = .08	r = -.35 p = .01	r = .24 p = .08	r = .45 p = .001

Table 2.3: Spearman's Correlation Coefficients between individual differences measures and memory, showing 2 tailed significance.

## Confidence

The participants' confidence in their false memories (rated on a 7-point scale) was given a mean rating of 4.41 (std. dev. 1.34), and the confidence for real memories received a mean rating of 4.88 (std. dev. 1.74). These two ratings were compared using a Wilcoxon Matched-Pairs Signed-Ranks Test and were shown to be significantly different ( $z = -2.75$ ,  $p(2t) = .006$ ). Participants were significantly less confident in their false memories than in their actual memories.

### **DISCUSSION OF STUDY 2.3**

In keeping with the previous two studies, Study 2.3 demonstrated the effectiveness of the procedure in generating false memories. In each of the studies, participants have developed false memories for approximately a quarter of the slides that they were asked to imagine. This supports the multiple-trace theories of false memory, which indicate that memory distortions are produced, to some extent, by source confusion. However, the results do not show any significant correlations between the number of false memories developed and scores on the individual differences measures. This corresponds to the results obtained previously, but contradicts the hypothesis that participants who have high paranormal belief, visual imagery, dissociation and transliminality will be more susceptible to false memories. As with Study 2.2, there is a correlation approaching significance between paranormal belief and forgetting scores. In keeping with the results from Studies 2.1 and 2.2, participants were significantly less confident in their false memories than their actual memories.

The findings concerning the four individual differences measures are closer to the predicted results. Transliminality correlates strongly with dissociation, visual imagery and paranormal belief. Paranormal belief also correlates with visual imagery and has a correlation approaching significance with dissociation. The only expected correlation not present is between visual imagery and dissociation. The strength of the individual differences data appears to justify the use of mature participants in the study. The results are far more persuasive than those obtained using undergraduate psychology students because they correspond with the previous research. However, in accepting that the data produced in this study support the notion of correlation between the individual differences measures, it is also necessary to accept the indication that there is no relationship between susceptibility to false memory and paranormal belief.

## ***GENERAL DISCUSSION***

This chapter presents the results of three studies investigating the possible correlation between false memory and belief in the paranormal, building on the four similar studies conducted by Blackmore and Rose. Only one of these seven studies has successfully found this correlation (Study 2.1), and this was conducted with few participants and showed a correlation that was only just significant. This leads to the inevitable question of whether the hypothesised correlation does actually exist, and, if it does, why it is not more evident in these studies?

In both Studies 2.2 and 2.3, there was a correlation approaching significance between paranormal belief and forgetting scores, and no correlation between forgetting and false memory. This is interesting from two respects. Firstly, it suggests that forgetting and false memory development are two separate effects, rather than sharing the same mechanism. Secondly, it supports the idea that general memory error may be related to belief in the paranormal, although the development of false memories in these studies is not.

The confidence data from all three studies contradict that of Blackmore and Rose (1997), as participants were less confident of their false memories than their actual memories. However, this is in concordance with the results analysed by Pezdek and Taylor (2000), when they reviewed the area. They reported that every false memory study which examined confidence indicated less confidence in false memories than actual memories, although this was not always significant.

One possible explanation for the lack of significant correlations between false memory and paranormal belief is that the method used for generating false memories is not producing the type of memories that would correlate with paranormal belief. What the participants are actually reporting is a source error (confusing imaginings for photographs) rather than a

memory for an event that never actually happened, or a distortion involving specific items. Whilst the participants are reporting seeing a photograph that was only imagined, the image that they are recalling is a real image. It may be, therefore, that the use of a different technique for the generation of false memories, such as using post-event misinformation (Loftus et al., 1989), or implanting false memories for childhood events (Porter, Yuille, & Lehman, 1999) would produce the expected correlation between false memory and paranormal belief. The false memories generated as a result of these techniques have been shown to be confidently held and reliable over time, and are ‘memories’ for events that have actually never happened – a much clearer distinction than the memories for imaginings, rather than photographs, generated in the present study.

This possibility is supported by Platt, Lacey, Iobst and Finkleman (1998), who indicate that the correlation between false memory generation and dissociation may be specific to certain types of false memory development. In particular, they suggest that while false memories developed as a result of suggestion may correlate with dissociation, false memories developed naturally over time may not. Platt et al. (1998) point out that the two types of false memory involve very different cognitive processes, and a correlation between a particular individual differences measure and one form of false memory cannot indicate a similar correlation between the individual differences measure and a different form of false memory. Their views are also supported by Marks (1973). He indicates that participants with very strong visual imagery demonstrate better recall of pictures than those with low visual imagery. This is contrary to the established view that visual imagery increases false memory (e.g. Loftus, Levidow & Duensing, 1992). Therefore, although individuals with high visual imagery may be more susceptible to false memory in general, they may overperform on tasks examining memory for pictures.

However, if this explanation for the lack of correlation between paranormal belief and false memory were accepted, it would cast doubt on the argument of Blackmore and Rose (1997).

They suggested that it was the confusion between imagination and reality that would cause believers to misremember events as being paranormal. The findings of the present study would indicate that simply imagining a paranormal event is not sufficient to cause believers to feel that they experienced it.

However, an alternative explanation for the lack of observable correlation between false memory and paranormal belief may be concerned with the material for which false memories are being developed. Blackmore and Rose's (1997) original hypothesis stated that that people who believe in the paranormal are more likely to confuse reality and imagination, and therefore misinterpret imagined events as real. The suggestion is that this would be an explanation for apparently psychic experiences – that people misinterpret imaginings as an actual paranormal events and this either contributes to, or is caused by, their belief in the paranormal. There is a great deal of literature suggesting that people will interpret events in a manner that is congruent with their existing beliefs (e.g. Gilovich, 1991), thus it is plausible that people who believe in the paranormal will misinterpret certain confusions as being indicative of paranormal activity, and, conversely, that non-believers will disregard such possibilities. The data presented from the present series of studies suggest that there is no such link between paranormal belief and events that are unrelated to paranormal activity. Materials that are not suggestive of psychic ability are no more likely to provoke false memories in believers than non-believers. However, there is little research thus far conducted which examines whether the effect would be present when using psi-related materials. It was decided, therefore to conduct a series of studies examining whether paranormal believers are more likely to be affected by misleading suggestions regarding anomalous events.



## ***CHAPTER 3: THE EFFECTS OF PRE-EVENT SUGGESTION AND BELIEF ON THE EXPERIENCING OF UNUSUAL PHENOMENA<sup>1</sup>***

### ***INTRODUCTION***

Study 3.1 was carried out as a pilot study, to test the effectiveness of the materials and procedure to be used in a subsequent more extensive study. The present studies took place at Hampton Court Palace, which has a well-established reputation for being haunted (Guiley, 1994). In particular, the Palace is reputed to be haunted by the ghost of Catherine Howard, the fifth wife of Henry VIII. Catherine was sentenced to death for adultery, and is commonly believed to have been dragged to her death along what is now known as the Haunted Gallery. There has been a long history of unusual phenomena experienced in and around the Haunted Gallery (Guiley, 1994), and the most recent of these have been collected by staff at Hampton Court. The experiences typically involve sudden temperature changes, feelings of dizziness and a sense of presence (Franklin, 1998). The phenomena are not solely experienced in the Haunted Gallery; sightings are reported around the Palace, but another area particularly associated with unusual experiences is an area close to the Haunted Gallery known as the Georgian Rooms (Franklin, 1998).

Participants in the studies were given a lecture describing the history of Hampton Court Palace which mentioned some specific stories about the hauntings. They were sent to either the Haunted Gallery or the Georgian Rooms, and asked to note down any unusual phenomena they experienced. Participants were allowed to wander around freely and were encouraged to record experiences whether or not they attributed the experience to a ghost. It was expected that participants who believed in ghosts, and those with prior expectation of having an unusual experience, would record more experiences than disbelievers and those with low prior expectation. It was further expected that the experiences would be rated as more intense and more likely to be due to a ghost.

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<sup>1</sup> The work described within this chapter was conducted within the context of a larger study involving a several researchers, investigating the effect of a number of variables on the experiencing of unusual events. The author was highly involved in the design, planning and data collection for the study.

## **Effect of belief**

It has been widely established that there is a strong correlation between paranormal belief and anomalous experiences (Irwin, 1993). For instance, Glicksohn (1990) surveyed a large number of people and found that degree of belief in the paranormal was positively correlated with subjective paranormal experiences. With specific regard to haunting experiences, Houran and Thalbourne (2001) reported a positive relationship between paranormal belief and experiencing of ghostly phenomena. Houran and Wiseman (in press) also reported this relationship. They propose that, further to Irwin (1985b), participants who believe in the paranormal have a psychological need to experience unusual phenomena.

The hypothesis that believers will experience more anomalous experiences than disbelievers in the present study is supported by two theories that may operate separately or interact. Houran and Wiseman (in press) suggest that there may be an expectation effect, in which participants who believe in the paranormal have higher anticipation that an event may occur. Additionally, they indicate that experiencing of anomalous events may be related to an unusual sensitivity to environmental features. Therefore believers attend to situations differently than disbelievers, and therefore are more aware of any unusual events that may occur. Within the context of the Hampton Court studies, it would be expected that the believers would experience more unusual phenomena because they are better prepared than disbelievers to attend to, and accept, anomalous events.

An alternative explanation is that, whilst believers will experience more events that they consider paranormal, they are actually misinterpreting neutral stimuli. There is a strong literature indicating that perception of an event is heavily affected by the existing beliefs of the percipient. Situations and people will be regarded differently according to what is already known or assumed (Gilovich, 1991). Sanbonmatsu et al. (1998) attribute this to selective hypothesis testing, which is effective for two different reasons. Firstly, individuals tend to avoid situations in which beliefs and assumptions are challenged, allowing them to maintain attitudes that are incorrect or inconsistent. Secondly, people will be selective in how they test attitudes and interpret findings, often perceiving ambiguous or neutral stimuli as congruent with existing beliefs. Therefore, it may be inferred that pre-existing beliefs

will not only affect the way a paranormal believer views an event, but may actually cause them to experience more phenomena that they could interpret as paranormal. The effect of pre-existing belief on experience of an event was demonstrated by Benoit and Thomas (1992). They found that participants who believed in subliminal perception were more likely than disbelievers to report hearing subliminal messages on recordings. Further, believers who had been told that a subliminal message would change their mood positively showed a significant increase in mood after hearing a recording, despite the fact that no message was present. The reverse is true of believers who were expecting a negative effect on mood – their moods significantly declined. Participants who did not express a belief in subliminal perception were not affected by the instructions. This study demonstrates that it is not necessary for an item to be present to affect perception – it is only necessary for a person to believe it is. It has been widely demonstrated that participants who believe in the paranormal may selectively attend to evidence, or even distort it, in order to maintain their beliefs (e.g. French, 1992b). However, it is also possible that believers genuinely do experience more events that they can interpret as paranormal, because they attend to situations differently and have different expectations about what might occur. Applying this theory to the present studies, it could be expected firstly that believers will be more aware of any small environmental changes than disbelievers, because they will be more alert to the possibility of them. Secondly, the believers will be more likely to misinterpret any noticed changes as being due to a ghost, rather than considering alternative explanations.

Given the established link between paranormal belief and unusual experiences, participants in the present study were asked to record whether they had experienced any of a list of eight unusual experiences. These experiences were selected as being commonly associated with the presence of a ghost (e.g. Haining, 1987). The participants that had experienced the phenomena were then asked to say whether or not they felt that these experiences were due to a ghost. It was predicted that participants with belief in ghosts would record having experienced unusual phenomena more frequently than those who did not express a belief in ghosts, and that believers would be more inclined to attribute their experiences as being due to a ghost.

## ***STUDY 3.1***

### **METHOD**

#### **Design**

The study examined the effect of belief in ghosts on experiences in the study, and this was a between-subjects variable. Participants were split into three groups – believers, those who were uncertain, and disbelievers – according to their responses to the ghost belief question on the Prior Experiences and Belief Questionnaire.

Four dependent variables (DV) were collected from the participants. The first DV measured the number of unusual experiences reported by the participants prior to entering the study, as recorded on the Prior Experiences and Belief Questionnaire. It was hypothesised that participants who believed in ghosts would report more prior experiences than others, and would be more likely to rate these experiences as being due to a ghost.

The second DV measured how many unusual experiences the participants had during the study. This was recorded by marking the location of the experience on the Location Map. The hypothesis was that participants who believed in ghosts and those who had higher prior expectation would have more unusual experiences.

The third DV assessed the intensity of participants' experiences. This was measured on a seven-point scale (1 = 'Not at all intense' and 7 = 'Very intense'). It was hypothesised that participants who believed in ghosts would have more intense experiences.

The fourth DV measured the degree to which participants believed that their experiences were due to a ghost. This was recorded on a five-point scale (1 = 'Definitely Yes', 5 = 'Definitely No'). It was hypothesised that participants who believed in ghosts would be more likely to say their experience was due to a ghost.

## **Participants**

The participants were a self-selecting sample, consisting of members of the public who chose to attend a lecture on ghosts at Hampton Court Palace. 98 participants were run over 2 days, but data from 21 of these were discarded, due to incorrect completion of forms. This left 77 participants, comprising 30 males and 47 females with a mean age of 33.6 years (std. dev. 14.33) (ages ranged from 10 to 69 years). These participants were split into two groups – 41 (53.3%) visited the Haunted Gallery and 36 (46.7%) visited the Georgian Rooms.

## **Materials**

### *Prior Experiences and Belief Questionnaire* (see Appendices F and G)

Each participant was provided with a questionnaire asking for details about their previous anomalous experiences and their belief in ghosts. Belief was measured by the question ‘Do you believe that ghosts exist?’. Participants responded on a five-point scale where 1 was ‘Definitely Yes’ and 5 was ‘Definitely No’. Previous anomalous experiences were measured by presenting the participants with a list of eight unusual experiences (such as change of temperature, sense of presence, sounds or noises) and asking them to record on a five-point scale (1 = ‘Never’, 5 = ‘Very Frequently’) how often these occurred. The participants that reported experiencing these phenomena were then asked to record whether they believed the experience could be due to a ghost. Again, this was recorded on a five-point scale, where 1 was ‘Definitely Yes’ and 5 was ‘Definitely No’.

This questionnaire also asked if the participants had any prior knowledge of possible haunted locations in Hampton Court from the media or acquaintances. Their responses were entered on a five-point scale, where 1 was ‘Definitely Yes’ and 5 was ‘Definitely No’. Finally, the participants were asked whether they expected to have an anomalous experience during the study. This too was measured on a five-point scale where 1 was ‘Definitely Yes’ and 5 was ‘Definitely No’.

### *Location Map* (see Appendices H and I)

Participants were also given an A4 map of the location that they were to visit (Haunted Gallery or Georgian Rooms). They were asked to record the location of any anomalies they

might experience by placing a cross on the relevant section of the map, and to provide brief written details of the experience. The intensity of the experience was recorded on a seven-point scale where 1 was 'Not at all intense' and 7 was 'Very intense'. Participants also rated whether or not they thought the experience was due to a ghost. This was on a five-point scale where 1 was 'Definitely Yes' and 5 was 'Definitely No'.

A final section of the form asked participants to give their name and address if they wished to receive a more detailed follow-up questionnaire.

### **Procedure**

Participants were run in groups of 30 - 40, 3 times a day for 1 day. The study was advertised as a special event taking place at Hampton Court Palace, and places were allocated on a first-come, first-served basis. As participants entered the room, they were randomly assigned places in either the Haunted Gallery group or the Georgian Rooms group.

The participants were then asked to fill in the Prior Experiences and Belief Questionnaire, with the exception of the final question regarding their expectation of experiences during the study. When all the participants had completed the form, they were given a 15 minute lecture about the history of investigating ghosts, including information about specific hauntings at Hampton Court Palace. During this lecture, both groups were told about possible hauntings in the location that they were to visit. After the lecture had finished, the participants were told that they would shortly be taken to the locations and allowed to walk around by themselves. If they felt anything unusual, they were asked to mark it on their map and give a brief written description of the experience. After the participants received these instructions, they filled in the final question on the Prior Experiences and Belief Questionnaire, recording whether or not they expected to have an unusual experience during the study.

At this point, the two groups were separated and led to the two locations. They were briefly shown where they were on the map, and told where the experimenters would be waiting

should they have any questions. At this point it was emphasised that there was no time limit involved, and that they should make a note of any experiences that they had. The participants then spent some time walking around the locations, recording whether or not they experienced anything. They then returned their maps and questionnaires to the experimenters and were free to leave.

## **RESULTS**

Participants' belief in ghosts was recorded on the Prior Experiences and Belief Questionnaire, and participants were classified as either believers, uncertain or disbelievers on the basis of their responses. 48 participants gave responses of '1' or '2' on the belief question, and were classified as believers (mean response = 1.67, std. dev. = .48). 16 participants gave a response of '3' and were classified as uncertain (mean response = 3, std. dev. = 0). 13 were classified as disbelievers (mean = 4.15, std. dev. = .38) as they gave responses of '4' or '5' on the belief question.

The data concerning prior expectation and the number of experiences were analysed using the data of all participants. The data for intensity and ghost ratings was analysed using only the data of those participants reporting unusual experiences during the study.

### **Previous experiences**

Participants were asked to record whether they had previously experienced eight examples of anomalous phenomena, and if so, how frequently. These were rated on five-point scales (1 = 'Never', 2 = 'Very Infrequently', 3 = 'Infrequently', 4 = 'Frequently', 5 = 'Very Frequently'). The participants that reported experiencing these phenomena were then asked to record whether they believed the experience could be due to a ghost. Again, this was recorded on a five-point scale, where 1 was 'Definitely Yes' and 5 was 'Definitely No'.

The mean rating given to all eight experiences combined was 1.95, suggesting that the majority of participants very rarely experienced any of the phenomena listed. A factorial ANOVA demonstrated that the mean rating for the eight prior experiences was not affected

by belief ( $F(2, 76) = 1.76, p = .18$ ). Table 3.1 shows the mean ratings for prior experiences, separated by belief.

BELIEVERS	UNCERTAIN	DISBELIEVERS	MEAN
2.02	1.94	1.68	1.95
(.62)	(.59)	(.34)	(.58)
N = 48	N = 16	N = 13	N = 77

Table 3.1: Overall mean ratings for prior experiences (and standard deviations), separated by belief.

Of the eight anomalous experiences listed, participants most commonly experienced an unusual sense of presence and emotional feelings. Factorial Anovas were conducted on the ratings for each of the experiences, in order to examine whether the experience reports were affected by belief. Only an unusual sense of presence showed a significant effect of belief on ratings. The mean difference in sense of presence scores between believers and uncertain participants was .54, and Fisher's Least Significant Difference (FLSD) test demonstrated that this was not significant (FLSD = .55,  $p > .05$ ). The difference between believers and disbelievers was .77 and this was significant (FLSD = .6,  $p < .05$ ). The difference between uncertain participants and disbelievers was .23, which was not significant (FLSD = .71,  $p > .05$ ).

Table 3.2 gives the mean ratings and F- and p- values for the eight anomalous experiences. Table 3.3 shows the mean differences between the three belief groups for each of the experiences.

Participants also rated whether they felt that these experiences were due to a ghost. A factorial Anova showed a significant effect of belief on these ratings, with participants who believed in the paranormal giving the highest ratings, and disbelievers giving the lowest ratings. The mean difference in ghost ratings between believers and uncertain participants was -.25, and Fisher's Least Significant Difference (FLSD) test demonstrated that this was not significant (FLSD = .54,  $p > .05$ ). The difference between believers and disbelievers was -1.26 and this was significant (FLSD = .59,  $p < .05$ ). The difference between uncertain participants and disbelievers was -1.01, which was also significant (FLSD = .7,  $p < .05$ ). The ghost ratings are also shown in Tables 3.2 and 3.3.



	BELIEVERS (N = 48)	UNCERTAIN (N = 16)	DISBELIEVERS (N = 13)	MEAN (N = 77)	F-value	p-value (2 tailed)
TEMP CHANGE	2.06 (.95)	2.13 (1.2)	1.54 (.78)	1.99 (.99)	1.65 (2, 76 df)	.2
SENSE OF PRESENCE	2.54 (.97)	2 (.82)	1.77 (1.09)	2.3 (1.01)	4.29 (2, 76 df)	.02
UNUSUAL SOUND	2.46 (1.03)	2.06 (1.06)	1.85 (.9)	2.27 (1.03)	2.29 (2, 76 df)	.11
UNUSUAL SIGHT	1.56 (.8)	1.5 (.63)	1.54 (.52)	1.55 (.72)	.05 (2, 76 df)	.96
UNUSUAL TASTE	1.38 (.67)	1.38 (.72)	1.23 (.44)	1.35 (.64)	.27 (2, 76 df)	.77
UNUSUAL SMELL	1.69 (.97)	1.88 (1.26)	1.69 (.95)	1.73 (1.02)	.21 (2, 76 df)	.81
DIZZINESS	1.85 (1.03)	2.19 (1.05)	1.77 (.83)	1.91 (1)	.81 (2, 76 df)	.45
EMOTIONAL FEELING	2.63 (1.18)	2.38 (1.26)	2.08 (.76)	2.48 (1.14)	1.27 (2, 76 df)	.29
DUE TO A GHOST?	2.81 (.96)	3.06 (.85)	4.08 (.95)	3.08 (1.04)	9.29 (2, 76 df)	.0003

Table 3.2: Mean ratings for the eight prior experiences, ghost ratings, F-values and p-values (2 tailed) for differences between belief groups.

		BELIEVER VS UNCERTAIN	BELIEVER VS DISBELIEVER	UNCERTAIN VS DISBELIEVER
TEMPERATURE	MEAN DIFFERENCE	-.06	.52	.59
SENSE OF PRESENCE	MEAN DIFFERENCE	.54	.77	.23
SOUND	MEAN DIFFERENCE	.4	.61	.22
SIGHT	MEAN DIFFERENCE	.06	.02	-.04
TASTE	MEAN DIFFERENCE	0	.14	.14
SMELL	MEAN DIFFERENCE	-.19	-.01	.18
DIZZINESS	MEAN DIFFERENCE	-.33	.09	.42
EMOTIONAL FEELING	MEAN DIFFERENCE	.25	.55	.3
DUE TO A GHOST?	MEAN DIFFERENCE	-.25	-1.26	-1.01

Table 3.3: Mean differences for belief group comparisons.

## Prior expectation

Participants' expectation of experiencing something unusual, prior to entering the location, was rated on a five-point scale, in which 1 indicated 'Definitely Yes' and 5 indicated 'Definitely No'. A factorial Anova showed this to be significantly influenced by belief ( $F(1, 76) = 6.29, p = .003$ ), with disbelievers having less expectation than both believers and those who were uncertain; however uncertain participants had more expectation than believers. Table 3.4 shows the mean prior expectation ratings.

BELIEVERS	UNCERTAIN	DISBELIEVERS	MEAN
3.63	3.56	4.46	3.75
(.82)	(.81)	(.66)	(.85)
N = 48	N = 16	N = 13	N = 77

Table 3.4: Mean prior expectation ratings (and standard deviations), separated by belief.

The mean difference in expectation scores between believers and uncertain participants was .06, and Fisher's Least Significant Difference (FLSD) test demonstrated that this was not significant (FLSD = .46,  $p > .05$ ). The difference between believers and disbelievers was -.84 and this was significant (FLSD = .49,  $p < .05$ ). The difference between uncertain participants and disbelievers was -.9, which was also significant (FLSD = .59,  $p < .05$ ).

## Experiences

The total number of unusual experiences reported during the course of the study was 57, a mean of .74 (std. dev. 1.13) per participant. Table 3.5 presents the number and percentage of participants in each group reporting experiences.

	BELIEVERS	UNCERTAIN	DISBELIEVERS	TOTAL
MEAN NO. OF EXPERIENCES	.75 (1.04)	.56 (.89)	.92 (1.66)	.74 (1.13)
% REPORTING EXP	47.92%	37.5%	46.15%	45.45%
NO. REPORTING	N = 23	N = 6	N = 6	N = 35
NO. IN GROUP	N = 48	N = 16	N = 13	N = 77

Table 3.5: The mean number (and standard deviation) of experiences, number and percentage of participants reporting experiences, separated by belief.

A factorial Anova showed that the number of experiences reported was not affected by belief ( $F(1, 76) = .37, p = .7$ ). Believers, disbelievers and uncertain participants experienced approximately equal numbers of experiences.

### *Intensity of experiences*

Intensity ratings were given on a seven-point scale where 1 indicated 'Not at all intense' and 7 indicated 'Very intense'. A factorial Anova demonstrated that the intensity of experiences was not affected by belief ( $F(1, 34) = .4, p = .67$ ). Believers, uncertain participants and disbelievers were equally likely to rate their experiences as being intense. These data are shown in Table 3.6.

BELIEVERS	UNCERTAIN	DISBELIEVERS	MEAN
3.74	4.33	4.33	3.94
(1.89)	(1.63)	(1.97)	(1.83)
N = 23	N = 6	N = 6	N = 35

Table 3.6: Mean intensity ratings (and standard deviations), separated by belief.

### *Ghost ratings*

Participants rated their belief that their experience was due to a ghost on a five-point scale, in which 1 indicated 'Definitely Yes' and 5 indicated 'Definitely No'.

A factorial Anova was conducted on the ghost ratings, and they were shown to be affected by belief ( $F(1, 34) = 4.56, p = .02$ ). The mean difference in ghost ratings between believers and uncertain participants was  $-.29$ , and this was shown by the FLSD test not to be significant ( $FLSD = .76, p > .05$ ). The difference between believers and disbelievers was  $-.112$  and this was significant ( $FLSD = .76, p < .05$ ). The difference between uncertain participants and disbelievers was  $-.83$ , which was not significant ( $FLSD = .96, p > .05$ ). Table 3.7 shows these data.

BELIEVERS	UNCERTAIN	DISBELIEVERS	MEAN
3.04	3.33	4.17	3.29
(.77)	(.52)	(1.17)	(.89)
N = 23	N = 6	N = 6	N = 35

Table 3.7: Mean ghost ratings (and standard deviations), separated by belief.

### DISCUSSION OF STUDY 3.1

It was hypothesised that participants who recorded a belief in ghosts would report having had more unusual experiences in everyday life than disbelievers. This hypothesis was not supported, as there was no overall effect of belief on the number of previous experiences reported. There was, however, an effect of belief on the number of times an unusual sense of presence was reported. Additionally, there was an extremely significant effect of whether the participants rated these previous experiences as being due to a ghost, with believers showing more conviction than disbelievers.

Prior to entering the locations, there was a significant effect of belief on the amount of expectation of having an unusual experience. The disbelievers had less expectation of having an unusual experience than both the believers and the uncertain participants. This was in accordance with the hypothesis.

Contrary to expectation, there was no significant effect of belief on the number of unusual experiences reported during the study. Although a greater percentage of the believers reported more unusual experiences than both the disbelievers and the uncertain participants, the disbelievers reported a higher mean number of experiences. Although fewer disbelievers had experiences, those that did tended to have a greater number of them. These differences were not significant.

There was also no effect of belief on the intensity ratings. The believers rated their experiences as less intense than both the disbelievers and the uncertain, but this difference

was not significant. This was contrary to the hypothesis that belief in ghosts would affect intensity ratings.

Belief in ghosts did, in accordance with the hypothesis, have a significant effect on ghost ratings. The participants who indicated a belief in ghosts gave higher ghost ratings than the uncertain participants and the disbelievers. The difference in ghost ratings between the believers and disbelievers was significant.

There is, therefore, some support for the prediction that interpretation of an event will be dependent on existing beliefs, and this is in accordance with the theory of selective hypothesis testing. This supports the notion that believers in the paranormal will have a tendency to misinterpret neutral stimuli as being paranormal in origin. The idea that believers will be more alert to environmental changes than disbelievers, and therefore experience more events, was not supported. The study also demonstrated that, within the experimental situation, participants experienced a high number of unusual phenomena which they found reasonably intense. This first study was intended as a pilot study in order to assess the practicalities of the experimental protocol, and the usefulness of the materials. It was determined that the study provided an effective and practical way to assess the impact of prior biases on exceptional experiences, and consequently the study was replicated and extended.

## ***STUDY 3.2***

### **INTRODUCTION TO STUDY 3.2**

Study 3.1 was successful in eliciting from participants a high number of unusual phenomena, and there was some suggestion that prior expectation would influence phenomena experienced within the location visited. It was decided to test this concept further by exposing participants to misleading suggestion prior to entering the location.

## **Effect of suggestion**

Few studies have been conducted to assess the impact of misleading suggestion before an event has taken place. Lindsay and Johnson (1989b) designed a procedure which slightly adapted the standard misinformation studies. Their design involved presenting participants with misleading information about a series of slides that they were about to see. The results of this research showed that misinformation was still effective even when presented in advance of the stimuli being shown. This procedure was replicated by Rantzen and Markham (1992), and they also reported that the misleading suggestion had an effect when given before the stimuli. Rantzen and Markham (1992) suggested that when participants were asked to recall the information when tested later, they had source monitoring problems which made it difficult for them to assess whether the misleading details came from the actual stimuli or the preceding information. Thus, although the memories of the participants were affected, it was not clear whether or not their perception was altered at the time of viewing the stimuli.

Thorne and Himelstein (1984) examined whether misleading information given before a stimulus could actually alter the perception of a percipient. They suggested to participants that a record played backwards contained satanic messages, and then asked participants to listen to reverse-played records. They found that the suggestion did have a significant effect – participants who received the suggestion were more likely to report hearing satanic messages. Additionally, the effect could be manipulated further, so that participants who were told that they would hear satanic words reported a greater number of words than other participants, and those who were told that they would hear satanic messages reported hearing more messages than other groups.

There is also some indication that giving misleading information about the difficulty of a tongue-twister can influence a participant's ability to read it. Hulit (1987) presented participants with a series of tongue-twisters which had gradations of difficulty randomly attached to them. He reported that participants failed to recite the tongue-twisters rated as 'difficult' more often than those rated as 'easy'. However, this effect is not consistent (Hulit, 1989). Therefore, there is a small amount of research to indicate that misleading pre-

event suggestion may affect perception of, behaviour during, and recollection of, an event. However, this has not been widely investigated.

The technique of giving misleading pre-event suggestion is perhaps closer to the persuasion literature than the classical suggestion literature, as it involves attempting to influence a person's behaviour by altering their attitudes towards a particular event. Myers (1994) summarises research describing the two main routes to changing a person's attitudes by means of persuasion. The first route is the central route to persuasion, which involves use of systematic argument in order to demonstrate a point. The second route, and that used in the present study, is the peripheral route, in which cues that will appeal to the listener are used to enhance the attractiveness of the suggestion. In the study, participants in the Suggestion condition were informed briefly, in the context of a lecture about hauntings at Hampton Court Palace, that the location that they were to visit had a particular reputation for being haunted, and this was illustrated with a brief anecdote. It was expected that, as participants were in the situation of attending a study where they would attempt to experience unusual phenomena, the idea that they were visiting a haunted location would be attractive and, thus, they would be motivated to accept the suggestion. However, participants with little inclination to have an experience, such as those who were sceptical about ghosts, would be more likely to reject the suggestion, as it disagrees with their prior expectations. This is predicted by the persuasion literature, which indicates that a person who is already likely to agree with a message will be persuaded by a simple, one-sided statement, whilst a person with a tendency to disagree will require a more complex, two-sided argument (Chaiken & Stangor, 1987). It is noted that persuasion using peripheral cues tends to be less enduring and is less likely to influence subsequent behaviour (Petty & Cacioppo, 1986). However, for the purposes of the present study, the attitudes of participants needed to be influenced only for the length of time necessary to complete the study.

In addition to the method of suggestion, prior research also indicates that the person making the argument is important to the degree of acceptance. People are more likely to be persuaded by a person who appears trustworthy and knowledgeable about the subject (Stroebe & Jonas, 1988). This is particularly important when persuasion is taking place by

the peripheral route, and participants are more interested in the heuristics surrounding the message, rather than the content of the message. In this study, participants were listening to a well-known scientist (Richard Wiseman) give an objective lecture about the possibility of hauntings at Hampton Court, and would have had little reason to question the reliability of the statements being made. It was, therefore, expected that participants receiving a suggestion that their location was haunted would be more likely to report unusual phenomena than those who did not receive the suggestion.

### **Interaction between belief and suggestion**

In addition to predicting individual effects of belief and suggestion on anomalous experiences within the study, it was also expected that there would be an interaction between belief and suggestion. There has been a small amount of research indicating that paranormal believers may be more suggestible than disbelievers. For instance, Haraldsson (1985) found a significant correlation between paranormal belief scores and scores on a general measure of suggestibility. However, even if believers are not more susceptible to global suggestion than disbelievers, it could still be expected that there will be an interaction between belief and suggestion within the context of the present study. This is because paranormal believers have a tendency to accept information congruent with their existing beliefs and to interpret neutral stimuli as being of paranormal origin (Russell & Jones, 1980). Therefore, the believers who have previously accepted the suggestion will be more inclined to interpret any neutral events as being paranormal. It is the case, therefore, that an interaction between suggestion and belief does not necessarily indicate a general relationship between susceptibility to suggestion and paranormal belief.

## **METHOD**

### **Design**

The study used a 2 x 3 design. Factor One examined the effect of prior-event suggestion on the experiences of participants. This was a between-subjects variable with two levels: participants were either in the 'Suggestion' condition – where they received a suggestion



that the location they were to visit was haunted – or the ‘No Suggestion’ condition – where they were not told that the location they were to visit was haunted.

Factor Two examined the effect of belief in ghosts on experiences in the study, and was a between-subjects variable. Participants were split into three groups – believers, those who were uncertain about the existence of ghosts, and disbelievers – according to their responses to the ghost belief question on the Prior Experiences and Belief Questionnaire.

Four dependent variables (DV) were collected from the participants. The first DV measured the number of unusual experiences reported by the participants prior to entering the study, as recorded on the Prior Experiences and Belief Questionnaire. It was hypothesised that participants who believed in ghosts would report more prior experiences than others, and would be more likely to rate these experiences as being due to a ghost.

The second DV measured how many unusual experiences the participants had. This was recorded by marking the location of the experience on the Location Map. The hypothesis was that participants who believed in ghosts and those in the Suggestion condition would have more unusual experiences.

The third DV assessed the intensity of participants’ experiences. This was measured on a seven-point scale (1 = ‘Not at all intense’ and 7 = ‘Very intense’). It was hypothesised that participants who believed in ghosts would have more intense experiences.

The fourth DV measured the degree to which participants believed that their experiences were due to a ghost. This was recorded on a five-point scale (1 = ‘Definitely Yes’, 5 = ‘Definitely No’). It was hypothesised that participants who believed in ghosts and those in the Suggestion condition would be more likely to say their experience was due to a ghost.

## **Participants**

Again, the participants were members of the public who chose to attend the ghost lecture at Hampton Court Palace. 931 participants were run over 7 days, but data from two of these

days (222 participants) were discarded due to media intrusion. Additionally, 247 participants were excluded due to incorrect completion of forms, leaving 462 participants. The remaining participants comprised 163 males and 299 females with a mean age of 35 years (std. dev. 16.27) (ages ranged from 7 to 82 years). These participants were split into two groups – 220 (47.6%) visited the Haunted Gallery and 242 (52.4%) visited the Georgian Rooms.

### **Materials**

Participants were provided with the same materials used in Study 3.1.

### **Procedure**

A similar procedure to that of Study 3.1 was employed. Study 3.2 took place over seven days but again used groups of 30-40 people. The main difference in this study occurred during the 15 minute lecture. During the lecture, the participants received a discreet suggestion that one of the two locations was haunted whilst the other was not. This took the form of the lecturer discounting traditional stories about hauntings in one of the locations (No Suggestion condition) and indicating to the participants that there were a number of anomalous experiences reported in the other location (Suggestion condition). The suggestions for the two locations were counter-balanced. After receiving the lecture, the participants then completed the experiment as described in Study 3.1.

## **RESULTS**

Participants' belief in ghosts was recorded on the Prior Experiences and Belief Questionnaire, and participants were classified as either believers, uncertain or disbelievers on the basis of their responses to the ghost question. 237 participants were classified as believers (mean = 1.61, std. dev. = .49) as they recorded responses of '1' or '2' on the belief question. 136 participants gave a response of '3' and were classified as uncertain (mean response = 3, std. dev. = 0). 89 were classified as disbelievers (mean = 4.24, std. dev. = .43) as they gave responses of '4' or '5' on the belief question.

The data concerning prior expectation and the number of experiences were analysed using the data of all participants. The data for intensity and ghost ratings were analysed using only the data of those participants reporting unusual experiences.

### Previous experiences

Participants were asked to record whether they had previously experienced eight examples of anomalous phenomena, and if so, how frequently. These were rated on five-point scales (1 = 'Never', 2 = 'Very Infrequently', 3 = 'Infrequently', 4 = 'Frequently', 5 = 'Very Frequently'). The participants that reported experiencing these phenomena were then asked to record whether they believed the experience could be due to a ghost. Again, this was recorded on a five-point scale, where 1 was 'Definitely Yes' and 5 was 'Definitely No'.

The mean rating given to all eight experiences was 2.12, suggesting that the majority of participants very rarely experienced any of the phenomena listed. A factorial Anova demonstrated that the mean rating of the eight prior experiences was significantly affected by belief ( $F(2, 461) = 29.09, p = .0001$ ). The mean difference in experience scores between believers and uncertain participants was .35, and Fisher's Least Significant Difference (FLSD) test demonstrated that this was significant ( $FLSD = .14, p < .05$ ). The difference between believers and disbelievers was .57 and this was significant ( $FLSD = .16, p < .05$ ). The difference between uncertain participants and disbelievers was .22, which was also significant ( $FLSD = .17, p < .05$ ). Believers had significantly more experiences than both uncertain participants and disbelievers. The uncertain participants had significantly more prior experiences than disbelievers. Table 3.8 shows the mean ratings for previous experiences, separated by belief.

BELIEVERS	UNCERTAIN	DISBELIEVERS	MEAN
2.33	1.98	1.76	2.12
(.73)	(.56)	(.55)	(.69)
N = 237	N = 136	N = 89	N = 462

Table 3.8: Overall mean ratings for prior experiences (and standard deviations), separated by belief.

Of the eight anomalous experiences listed, participants most commonly experienced unusual sounds and emotional feelings. Factorial Anovas were conducted on the ratings for

each of the experiences, in order to examine whether the experience reports were affected by belief. There was a significant effect of belief on frequency reports for each of the experiences, with believers reporting more experiences than the disbelievers. Table 3.9 gives the mean ratings and F- and p- values for the eight anomalous experiences. Table 3.10 shows the mean differences between the three belief groups and FLSD values for each of the experiences.

	BELIEVERS (N = 237)	UNCERTAIN (N = 136)	DISBELIEVERS (N = 89)	MEAN (N = 462)	F-value	p-value (2 tailed)
TEMP CHANGE	2.46 (1.16)	2.2 (1.02)	1.8 (.99)	2.26 (1.11)	12.43 (2, 461 df)	.0001
SENSE OF PRESENCE	2.87 (1.05)	2.01 (.92)	1.67 (.72)	2.41 (1.08)	61.44 (2, 461 df)	.0001
UNUSUAL SOUND	2.68 (1.2)	2.21 (.98)	2.19 (.96)	2.45 (1.12)	11.12 (2, 461 df)	.0001
UNUSUAL SIGHT	1.87 (.95)	1.49 (.83)	1.37 (.65)	1.67 (.89)	14.75 (2, 461 df)	.0001
UNUSUAL TASTE	1.59 (.88)	1.38 (.75)	1.29 (.64)	1.47 (.81)	5.52 (2, 461 df)	.004
UNUSUAL SMELL	2.03 (1.12)	1.72 (.96)	1.55 (.93)	1.84 (1.06)	8.06 (2, 461 df)	.0004
DIZZINESS	2.22 (1.16)	2.22 (1)	1.85 (.86)	2.15 (1.07)	4.27 (2, 461 df)	.01
EMOTIONAL FEELING	2.9 (1.19)	2.55 (1.08)	2.34 (1.06)	2.69 (1.15)	9.36 (2, 461 df)	.0001
DUE TO A GHOST?	2.64 (1.01) N = 234	3.58 (.67) N = 134	4.43 (.56) N = 88	3.26 (1.1) N = 456	158.04 (2, 455 df)	.0001

Table 3.9: Mean ratings for the eight prior experiences, ghost ratings, F-values and p-values (2 tailed) for differences between belief groups.

Participants who reported at least one of the anomalous experiences also rated whether they felt that these experiences were due to a ghost. 456 of the participants reported at least one experience. A factorial Anova showed a significant effect of belief on these ratings, with participants who believed in the paranormal giving the highest ratings, and disbelievers giving the lowest ratings. There were significant differences in the ghost ratings between each group, with the believers giving higher ratings than both the uncertain participants and the disbelievers, and the uncertain participants giving higher ratings than the disbelievers. These ratings are also shown in Tables 3.9 and 3.10.

		BELIEVER VS UNCERTAIN	BELIEVER VS DISBELIEVER	UNCERTAIN VS DISBELIEVER
TEMPERATURE CHANGE	MEAN DIFFERENCE	.27	.67	.4
	FISHER PLSD	.23*	.27*	.29*
SENSE OF PRESENCE	MEAN DIFFERENCE	.79	1.2	.41
	FISHER PLSD	.2*	.23*	.26*
UNUSUAL SOUND	MEAN DIFFERENCE	.47	.49	.02
	FISHER PLSD	.23*	.27*	.29
UNUSUAL SIGHT	MEAN DIFFERENCE	.38	.5	.12
	FISHER PLSD	.18*	.21*	.23
UNUSUAL TASTE	MEAN DIFFERENCE	.2	.29	.09
	FISHER PLSD	.17*	.2*	.21
UNUSUAL SMELL	MEAN DIFFERENCE	.31	.48	.17
	FISHER PLSD	.22*	.26*	.28
DIZZINESS	MEAN DIFFERENCE	-.001	.37	.37
	FISHER PLSD	.22	.26*	.28*
EMOTIONAL FEELING	MEAN DIFFERENCE	.35	.56	.21
	FISHER PLSD	.24*	.28*	.3
DUE TO A GHOST?	MEAN DIFFERENCE	-.98	-1.8	-.84
	FISHER PLSD	.18*	.21*	.23*

Table 3.10: Mean differences and FLSD values for belief group comparisons. Values significant at the 0.05 level are marked with an asterisk (\*).

### Prior expectation

Participants' expectation of experiencing something unusual, prior to entering the location, was rated on a five-point scale, in which 1 indicated 'Definitely Yes' and 5 indicated 'Definitely No'. The mean scores for prior expectation are shown in Table 3.11.

A 2 x 2 factorial Anova showed prior expectation to be significantly influenced by belief ( $F(1, 456) = 45.05, p = .0001$ ), but not whether participants had received a suggestion that the location was haunted ( $F(1, 456) = 1.18, p = .28$ ). There was no interaction between the Suggestion conditions and belief ( $F(1, 456) = .25, p = .78$ ). Participants who were uncertain whether they believed in ghosts had less expectation of an unusual experience than believers. Disbelievers had lower expectations of experiencing something than both believers and uncertain participants.

	BELIEVER	UNCERTAIN	DISBELIEVER	MEAN
SUGGESTION	3.5 (.86) N = 126	3.77 (.65) N = 77	4.4 (.7) N = 62	3.79 (.84) N = 265
NO SUGGESTION	3.37 (.86) N = 111	3.63 (.74) N = 59	4.41 (.5) N = 27	3.59 (.86) N = 197
MEAN	3.44 (.86) N = 237	3.71 (.69) N = 136	4.4 (.64) N = 89	3.7 (.85) N = 462

Table 3.11: Mean prior expectation ratings (and standard deviations), separated by belief and condition.

The mean difference in expectation scores between believers and uncertain participants was  $-.27$ , and this was shown by the FLSD test to be significant (FLSD =  $.16$ ,  $p < .05$ ). The difference between believers and disbelievers was  $-.96$  and this was also significant (FLSD =  $.19$ ,  $p < .05$ ). The difference between uncertain participants and disbelievers was  $-.69$ , which was also significant (FLSD =  $.16$ ,  $p < .05$ ).

### Experiences

The total number of unusual experiences reported was 432, a mean of  $.94$  (std. dev.  $1.41$ ) per participant. Table 3.12 gives the number and percentage of participants in each group reporting unusual experiences.

		BELIEVER	UNCERTAIN	DISBELIEVER	TOTAL
SUGGESTION	% REPORT EXP	56.35%	40.26%	24.19%	44.15%
	NO. REPORT	N = 71	N = 31	N = 15	N = 117
	NO. IN GROUP	N = 126	N = 77	N = 62	N = 265
NO SUGGESTION	% REPORT EXP	55.86%	49.15%	25.93%	49.75%
	NO. REPORT	N = 62	N = 29	N = 7	N = 98
	NO. IN GROUP	N = 111	N = 59	N = 27	N = 197
MEAN	% REPORT EXP	56.12%	44.12%	24.72%	46.54%
	NO. REPORT	N = 133	N = 60	N = 22	N = 215
	NO. IN GROUP	N = 237	N = 136	N = 89	N = 462

Table 3.12: The number and percentage of participants reporting experiences, separated by belief and condition.

A 2 x 2 factorial Anova conducted on the data showed no effect of suggestion ( $F(1, 456) = .89, p = .35$ ) on the number of experiences reported, although the participants in the Suggestion condition reported slightly fewer experiences than those in the No Suggestion condition. However, there was a significant effect of belief ( $F(1, 456) = 12.25, p = .0001$ ). There was no significant interaction between belief and suggestion ( $F(1, 456) = .18, p = .84$ ). Believers reported significantly more unusual experiences than disbelievers and uncertain participants did. Disbelievers reported fewer experiences than uncertain participants. Table 3.13 shows the mean responses in each of the conditions.

	BELIEVER	UNCERTAIN	DISBELIEVER	MEAN
SUGGESTION	1.21 (1.75) N = 126	.68 (1.04) N = 77	.34 (.65) N = 62	.85 (1.41) N = 265
NO SUGGESTION	1.27 (1.53) N = 111	.92 (1.28) N = 59	.44 (.89) N = 27	1.05 (1.41) N = 197
MEAN	1.24 (1.64) N = 237	.78 (1.15) N = 136	.37 (.73) N = 89	.94 (.14) N = 462

Table 3.13: The mean number of experiences (and standard deviation), separated by belief and condition.

The mean difference in the number of unusual phenomena that believers and uncertain participants experienced was .46, and this was shown by the FLSD test to be significant ( $FLSD = .29, p < .05$ ). The difference between believers and disbelievers was .87 and this was also significant ( $FLSD = .34, p < .05$ ). The difference between uncertain participants and disbelievers was .41, which was also significant ( $FLSD = .37, p < .05$ ).

#### *Intensity of experiences*

Intensity ratings were given on a seven-point scale where 1 indicated 'Not at all intense' and 7 indicated 'Very intense'. A 2 x 2 factorial Anova showed that the intensity of experience reported was significantly affected by belief ( $F(2, 209) = 7.24, p = .001$ ), but not by suggestion ( $F(1, 209) = .58, p = .45$ ). There was no significant interaction between belief and suggestion ( $F(2, 209) = .63, p = .53$ ). Disbelievers rated their experiences as less

intense than both uncertain participants and believers. The uncertain participants rated their experiences as less intense than the believers. These data are represented in Table 3.14.

	BELIEVER	UNCERTAIN	DISBELIEVER	MEAN
SUGGESTION	3.44 (1.58) N = 71	2.9 (1.64) N = 31	2.33 (1.76) N = 15	3.15 (1.65) N = 117
NO SUGGESTION	3.74 (1.46) N = 62	2.72 (1.49) N = 29	2.86 (1.22) N = 7	3.38 (1.52) N = 98
MEAN	3.58 (1.53) N = 133	2.82 (1.56) N = 60	2.5 (1.6) N = 22	3.26 (1.59) N = 215

Table 3.14: The mean ratings (and standard deviation) given to intensity of experiences, separated by belief and condition.

The mean difference in the intensity ratings given by believers and uncertain participants was .76, and this was shown by the FLSD test to be significant (FLSD = .47,  $p < .05$ ). The difference between believers and disbelievers was 1.08 and this was also significant (FLSD = .7,  $p < .05$ ). The difference between uncertain participants and disbelievers was .32, which was not significant (FLSD = .76,  $p > .05$ ).

### *Ghost ratings*

Participants rated their belief that their experience was due to a ghost on a five-point scale, in which 1 indicated 'Definitely Yes' and 5 indicated 'Definitely No'.

Participants' ghost ratings were shown by a 2 x 2 factorial Anova to be significantly affected by belief ( $F(2, 209) = 19.67, p = .0001$ ) but not by suggestion ( $F(1, 209) = .08, p = .77$ ). There was no significant interaction between belief and suggestion ( $F(2, 209) = .27, p = .77$ ). The believers were most likely to attribute their experiences as being due to a ghost, followed by the uncertain participants and then the disbelievers. Table 3.15 shows the mean ghost ratings.



	BELIEVER	UNCERTAIN	DISBELIEVER	MEAN
SUGGESTION	3.21 (.89) N = 71	3.65 (.61) N = 31	4.27 (.7) N = 15	3.46 (.88) N = 117
NO SUGGESTION	3.05 (.93) N = 62	3.66 (.86) N = 29	4.29 (.49) N = 7	3.32 (.96) N = 98
MEAN	3.14 (.91) N = 133	3.65 (.73) N = 60	4.27 (.63) N = 22	3.4 (.92) N = 215

Table 3.15: The mean ghost ratings (and standard deviation), separated by belief and condition.

The mean difference in the ghost ratings given by believers and uncertain participants was -.52, and this was shown by the FLSD test to be significant (FLSD = .26,  $p < .05$ ). The difference between believers and disbelievers was -1.14 and this was also significant (FLSD = .38,  $p < .05$ ). The difference between uncertain participants and disbelievers was -.61, which was also significant (FLSD = .41,  $p < .05$ ).

## DISCUSSION OF STUDY 3.2

### Effect of belief

The hypotheses that belief in ghosts would significantly affect reports of previous experiences, prior expectation, the number of experiences reported, the intensity of experiences and the ghost ratings were all supported. Responses to the questions concerning previous unusual experiences showed an overall significant effect of belief on the frequency of experiences reported. The believers reported significantly more anomalous experiences than both uncertain participants and disbelievers, and the uncertain participants reported more experiences than the disbelievers. When the eight experiences listed were examined individually, it was seen that the reporting of each experience was significantly affected by belief. Believers reported experiencing each phenomenon more frequently than disbelievers. In the majority of the experiences, the number of reports were staggered, with the believers reporting significantly more than the uncertain participants and disbelievers, and the uncertain participants reporting more than the disbelievers. Additionally, there was

also a significant effect of belief on the tendency to regard these experiences as being due to a ghost. The pattern here matched the previous pattern, with believers giving higher ratings than uncertain and disbelievers, and uncertain participants giving higher ratings than disbelievers.

With regard to the prior expectation data, there was an overall significant effect of belief, and the believers showed significantly greater prior expectation than either the uncertain participants or the disbelievers, and the uncertain participants had more expectation than the disbelievers. Thus, the amount of prior expectation among the participants was directly related to how much belief they had in ghosts. This pattern was also found in the data relating to how many experiences the participants reported during the course of the study. Again, there was an overall significant effect, and the believers reported more experiences than either the uncertain participants or the disbelievers, and the uncertain participants also reported more experiences than the disbelievers. The intensity ratings reflected a similar trend; the overall effect of belief was significant, and the believers gave significantly higher intensity ratings than both the disbelievers and the uncertain participants. The only non-significant difference was between the uncertain and the disbelievers. However, this difference was in the right direction with the uncertain giving higher intensity ratings than the disbelievers.

Finally, the ratings for whether participants thought their experience was due to a ghost showed the same effects of belief as the previous results. Overall, there was a significant effect of belief on the ghost ratings. The believers gave significantly higher ghost ratings than the uncertain and the disbelievers, and the uncertain gave higher ratings than the disbelievers.

It can therefore be seen that belief in ghosts significantly affects how an individual approaches and experiences events. Not only does belief affect a person's prior expectation of having an experience; it also affects the probability that that person will experience unusual phenomena, the intensity of those phenomena, and the likelihood that the person will classify the phenomena as ghostly. This is clearly an interesting finding with

ramifications for the way that spontaneous cases are assessed in future. These findings indicate firstly that believers in the paranormal may attend to situations differently than disbelievers. They may experience more unusual events than disbelievers because they are more aware of changes in the environment and have an anticipation that these changes will occur. Secondly, the findings indicate that believers are prone to misinterpreting stimuli as being of paranormal origin. It appears that the two factors work in conjunction to ensure that believers in the paranormal are more likely to experience events that they could interpret as paranormal.

### **Effect of suggestion**

The findings regarding the suggestion factor did not support the hypotheses. Participants who received the suggestion that the location they were to visit was haunted did not have higher prior expectation of having an unusual experience. They were also not more likely to actually have an unusual experience, give higher intensity ratings, or rate their experiences as being due to a ghost.

One possible reason for the failure of the suggestion to have an effect is that the participants did not actually 'receive' it. Stroebe and Jonas (1988) suggest that persuasive communications must go through two stages before they are effective. They must firstly be received by the percipient, then they must be accepted. Stroebe and Jonas (1988) state that the two main factors influencing the reception of a communication are motivation to attend to the communicator, and ability to understand them. Neither of these two factors should have adversely affected the participants in the present study – they had voluntarily attended the event and all fully understood other instructions given to them. Another possible hindrance to reception of the suggestion may have been that it was too subtle to adequately influence the participants.

The factors which affect acceptance of a persuasive communication were considered by Petty and Cacioppo (1986) in the Elaboration Likelihood Model. They suggested that the amount that a person elaborates upon (i.e. thinks about) a message, and the type of thoughts that are generated, will affect acceptance of the message. A communication that elicits

favourable thoughts is more likely to succeed, whereas one that evokes negative thoughts may result in non-acceptance of the suggestion, or even an acceptance of the opposing view. In the present study, two specific forms of negative thought may have been provoked by the suggestion. Firstly, it is possible that being told they were to visit a particularly haunted location may have aroused feelings of worry, wariness or fear in the participants. This could have resulted in a non-acceptance of the suggestion, and a defensiveness while at the location that prevented them from experiencing anything unusual. The second possibility is that participants were aware of the suggestion and realised that their responses were being manipulated. This again may have resulted in defensiveness at the location resulting in fewer experiences, and participants may have been less motivated to record any unusual phenomena they did experience.

### **Interaction between belief and suggestion**

No interaction was found between belief in the paranormal and acceptance of the suggestion. This was contrary to existing research suggesting that individuals with paranormal belief may be more suggestible than disbelievers (e.g. Haraldsson, 1985). It was also anticipated that an interaction between the two variables may be present even if believers are not more susceptible to global suggestion than disbelievers, as believers would be more inclined to accept the misinformation supplied in the present study. However, it is clear from the results that suggestion did not have an effect on the behaviour of either group. The believers consistently experienced more anomalous events than disbelievers, regardless of whether any misinformation had been received. It is possible that the lack of interaction between belief and suggestion may be the product of ceiling and floor effects. The believers were highly likely to experience unusual events regardless of the presence of suggestion, and the disbelievers were unlikely to experience them. This may be predicted from the existing correlation between paranormal belief and paranormal experiences (e.g. Irwin, 1985). It may be that the suggestion did not affect the believers because there was simply no opportunity to experience more unusual events than were already occurring. Similarly, the lack of suggestion may have failed to affect the disbelievers because there was little likelihood that they would have had an experience anyway.

## ***GENERAL DISCUSSION***

These studies were successful in demonstrating that belief can significantly influence the way a person experiences an unusual event. These findings are extremely helpful in interpreting spontaneous cases, as they suggest that reports of unusual phenomena cannot be viewed in isolation, but must be considered in conjunction with a number of other factors. These findings are in support of the selective hypothesis testing theory of Sanbonmatsu et al. (1998), which indicates that individuals with strong beliefs will attend to situations differently, and interpret them according to their existing attitudes. The failure of the suggestion to have an effect provides an interesting facet to this investigation, as it indicates that having a spontaneous unusual experience is not dependent on information provided by other people, but may be heavily dependent on pre-existing belief. This finding is supported by the results concerning previous experiences, as both the frequency of unusual experiences and the attributions accorded to them were both shown to be significantly influenced by belief in ghosts.

It is worth noting that merely participating in the study caused an increase in the number of experiences. As an informal control, 50 members of the public exiting the Haunted Gallery were asked if they had experienced anything unusual as they walked through. Only two replied that they had; one person had noticed a slight change in temperature, and the other reported a feeling of something brushing his arm. This small number of experiences is in contrast to the participants in the studies who reported a mean of nearly one experience per person. There are two possible explanations for this discrepancy, which are not necessarily independent. Firstly, the participants were spending more time in the locations than the members of the public, and were primed to be aware of any possible changes in the environment. Thus, they are simply more likely to have noticed any unusual phenomena. The second explanation is that the very act of participating in the study caused people to have a higher expectation of experiencing something unusual than the general public. It may be that participants in the study were, in a way, all in a suggestion group, as the possibility that something might happen had been implied while the other visitors to Hampton Court had not received this suggestion. Clearly some sort of priming effect caused

the participants in these studies to experience unusual events at a frequency that the general public do not, and it would be interesting to see whether members of the public who do experience unusual phenomena are themselves anticipating, or hoping for, an exceptional occurrence.

There are some issues to be considered with regard to the treatment of data in the studies. Participants completed the Prior Experiences and Belief Questionnaire individually, before visiting the locations. However, the Location Maps on which participants recorded their experiences were filled in while other people were present. It is possible that participants' experiences may not have been independent, as they may have been affected by the experiences of other participants (see Rosenthal & Rosnow, 1991). In addition, there may have been some social pressure to experience an event, given the situation and the fact that other people were having experiences. For practical reasons, participants had to be tested in large groups rather than individually, and this does reflect the situation in which ordinary visitors to Hampton Court experience unusual events. A potential way to counteract this problem would be to analyse the data for each group visiting the location, rather than for individual participants. However this would raise further issues with regard to the data, as the mean ratings for the group as a whole would not necessarily reflect the ratings given by the participants who actually experienced the events. For example, the number of events experienced was significantly affected by belief, thus within each group the participants with the most belief were having the most experiences. This important point would be lost if the comparison was of the mean belief for each group. For these reasons, it was decided to analyse the data according to individual scores. However, it is hoped that future work would overcome this problem by allowing participants to visit locations individually, and record their experiences without influence from others.

There are several interesting avenues of research that could be further explored in future studies. One option would be a follow-up study after a period of time, which could consider the way that participants recalled their experiences, and whether their reports were still affected by belief. It would also be interesting to investigate the possibility that there may be a delayed effect of suggestion, with participants in the groups who were primed to

experience unusual phenomena recalling a greater amount than control groups. This might be predicted from the multiple-trace theories of misinformation, and also as a product of the reversed eyewitness suggestibility effect (Lindsay & Johnson, 1989b). These indicate that misinformation can affect recollection of an event even if it is received beforehand, as source confusion results. Another area of investigation would be whether participation in the study affected belief in ghosts afterwards. In Study 3.2, nearly a quarter of disbelievers reported some form of unusual phenomena, as did 40% of people who were uncertain of whether ghosts exist. There is a possibility that this may have affected their views on the paranormal. Additionally, nearly half the believers did not experience anything unusual and this also may have affected their opinions.

The misleading pre-event suggestion in Study 3.2 failed to affect reports of unusual experiences. However, the data examining the differences between believers, uncertain participants and disbelievers did indicate that the groups approach events differently. Given this information, it was decided to investigate whether misleading suggestion as an event is taking place will affect experiences, and whether believers would be more affected than disbelievers.

## ***CHAPTER 4: THE EFFECTS OF DURING-EVENT SUGGESTION AND BELIEF ON THE RECOLLECTION OF SÉANCE ROOM PHENOMENA<sup>2</sup>***

### **INTRODUCTION**

The present study was an attempted replication and extension of two studies conducted by Wiseman and colleagues. In the first of these studies, Wiseman, Smith and Wiseman (1995) conducted a series of three 'séances' in which objects were moved by non-paranormal means, while groups of participants sat in a circle around the séance table. The séances were conducted in a completely dark room and the objects on the table were marked with luminous dots that showed up in the dark. The study aimed to establish whether eyewitness testimony is reliable in such a situation, and whether testimony is affected by pre-existing beliefs. The results showed that, even when questioned immediately after the séance took place, participants were extremely unreliable witnesses. They showed memory errors about events that happened during the course of the séance, and about which objects they had inspected before the séance took place. The belief data also showed interesting differences between the disbelievers and believers. The believers were more inclined than disbelievers to attribute movement to objects that remained stationary, and to attribute the events to paranormal sources. Thus, the study demonstrated that testimony for the séances was unreliable, and that this was more the case for believers than disbelievers. Wiseman, Seager and Smith (1997) extended the previous séance study of Wiseman, Smith and Wiseman (1995) in order to test whether misleading suggestion as events were taking place would also affect testimony. Eight séances were conducted at a convention for people interested in the paranormal. During the course of these séances, participants witnessed some faked phenomena (such as a ball moving), and it was suggested to them by the medium that the séance table was levitating. The authors found that eyewitness testimony was generally unreliable and that there was a strong effect of suggestion, with participants incorrectly reporting the levitation of the table.

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<sup>2</sup> The work described within this chapter was conducted in conjunction with the author's PhD supervisor, Dr Richard Wiseman. However, the author was extremely involved in the design and organisation and data collection for the study.



### **Effect of positive suggestion**

The concept of creating false memories via misleading post-event suggestion has been widely investigated. Laboratory research typically involves participants being shown an event (generally on slides or on a videotape), then receiving false information about what they have witnessed. This can take the form of either a written narrative containing inaccurate details of the event (e.g. Loftus, Donders, Hoffman, & Schooler, 1989), or in the form of questions that contain misleading details (Cassel & Bjorkland, 1995). Participants are then tested on their recollection of the events witnessed. During this testing, participants often report having seen details that were, in fact, suggested to them through post-event misinformation (Weingardt, Loftus, & Lindsay, 1995). The strength of the misinformation effect is such that memories of participants' childhood experiences can be altered (Loftus & Pickrell, 1995) or even confabulated completely (Hyman, Husband, & Billings, 1995). Indeed, it is not always even necessary for the misinformation to be plausible or logically possible; for example, Pezdek, Finger and Hodge (1997) managed to create false memories in Catholic participants of having engaged in Jewish religious practices in their childhood. Pezdek et al. did note, however, that these cases were rare, and that for maximum generation of false memory, the misinformation should correspond with the participants' schemas and pre-existing beliefs. In short, researchers have demonstrated that memories or reports can be fundamentally altered by supplying incorrect information about an event; and this holds true for both autobiographical memories and events witnessed in the laboratory.

There has been some research to suggest that misinformation can affect recollection of events even when it is presented before viewing the event (Lindsay & Johnson, 1989b; Rantzen & Markham, 1992). However, few researchers have explored the impact of misleading suggestion as an event is taking place. There are two lines of research which are relevant to the issue. Work on social conformity has demonstrated that, when placed alone in a group of confederates, participants will agree with the group consensus on an issue (such as which of a series of lines is longer) even if it is wrong, rather than risk social exclusion by giving their true opinion (Asch, 1955). However, it is not evident that their perceptions of what has happened have been altered in any way; rather, they

have changed their responses to avoid social embarrassment. Secondly, researchers investigating the autokinetic effect have examined whether the presence of a misleading suggestion can lead a participant to falsely report the movement of a spot of light. This research is typically carried out by placing the participant in a darkened room and allowing them to become accustomed to the lack of light. They are then presented with a small point of light and asked to report whether or not the light moves.

Sherif (1935, cited in van Avermaet, 1988) found that participants will typically describe seeing movement of the stationary light, and that the reports of movement can be affected by certain physical and social factors. He indicated that when participants were tested individually, they developed a fairly stable range of movement estimates. The range differed highly between participants, but the level of movement reported by each participant was consistent across a number of trials. However, when participants with a diverse range of movement estimates were tested in a group, their individual judgments converged into a stable group norm. When participants were tested in a group before being tested individually, the group norm estimates continued to affect their judgments of movement in sessions where the participants were alone.

The work of both Asch (1955) and Sherif (1935) has demonstrated that it is possible that participants' reports of events will be affected within a group situation, if they are aware of the judgments of others in the group. It has also been demonstrated that individuals' reports can be susceptible to suggestion from one other individual. Luchins and Luchins (1969) also investigated the autokinetic effect and found that if movement is suggested to the participant at the time by an authority figure, an increased number of movements will be reported. This research customised situations for each participant and placed the participants under some pressure to agree with the suggestion. For example, after having failed to respond to the suggestion in the first trial, one participant was told that the test was of intelligence and that her low score was evidence that she was a 'stupid person' (p. 234). After the initial suggestion by the authority figure, and the coercion to agree with the suggestion, the participants were further tested over a number of days. They continued to report movement of the light, even if the authority figure was no longer

present, implying that either the suggestion had altered the perception of participants, or that social pressure continued to exert an influence, despite the absence of the authority figure.

The idea of suggesting to participants that objects were moving during the course of the séances leads directly on from the autokinetic effect research. Both areas of study test the ability of participants to accurately gauge the movement of points of light in a darkened room, and the effectiveness of suggestion in that situation. Participants in autokinetic effect research have responded positively to suggestions that the light movement was occurring very frequently (Cautela & Vitro, 1964), and have reported light movement corresponding to the direction of movement suggested by the experimenter (Rechtschaffen & Mednick, 1955). Ozeki, Takahashi and Tsuji (1991) conducted two studies which further investigated the autokinetic effect. They examined the effect of experimenter suggestion on the participants' reports, but also the effect of self-suggestion. Before the actual experiment was conducted, participants were given prior tests to assess whether they had a 'dominant' direction of light movement (i.e. whether they consistently reported light movement in one particular direction). With regard to the experimenter's suggestion, participants were placed in two groups; half received a 'facilitative' suggestion that the target light would move in a direction consistent with their dominant direction, while the other half received a 'suppressive' suggestion that the light would move in the opposite direction to their dominant direction. In the self-suggestion area of the studies, participants were asked to cause the light to move in their dominant direction (facilitative suggestion); move the light away from their dominant direction (suppressive suggestion); or simply observe any movement of the light (control suggestion). The results of the studies were not conclusive; however, there was some implication that suggestion from the experimenter would affect the reports of participants who did not have a strong tendency towards an autokinetic effect, and that self-suggestion was effective for all participants, particularly in the suppressive suggestion condition. These results indicate that directions from an experimenter could sway reports of participants who are ambiguous in their response to

a stimulus, and that participants can influence the way that they view events if they approach the situation with a prior expectation of what will happen.

Wiseman et al. (1997) reported a significant effect of during-event suggestion on reports of anomalous events within the séance room. The role of suggestion within the séance room was also examined in the present study. In the séances, participants received the misleading suggestion that a bell placed on the séance table was moving. The bell did, in fact, remain stationary throughout the séance. It was anticipated that participants would accept the suggestion that the bell moved. In order to assess this, the positive suggestion was paired with a ‘control’ event, in which the movement was the same (i.e. the object remained stationary) but the verbal commentary was different (there was no suggestion of movement). The tambourine was selected as the paired object to the bell – it remained motionless throughout the séances and it was not referred to. This provides an opportunity to assess the reliability of reports of suggested events compared to observed events. If participants correctly reported that the tambourine remained stationary but incorrectly stated that the bell moved, it could be assumed that the suggestion had an effect in altering reports of the event. If the participants reported movement of both the bell and the tambourine, it could be assumed that they were simply reporting the events of the séance incorrectly. Reports indicating that neither the bell nor the tambourine moved would indicate that the participants were reliable witnesses and not suggestible.

### **Effect of negative suggestion**

The area of ‘negative’ suggestions – in which the lack of an event is suggested – has been little researched. In 1997, Miyashita and Monzen found that, under hypnosis, negative suggestions could significantly affect participants’ physiological reactions and their ability to respond in tests of imagery. This research was supported by Miyashita (1988, 1999) and Miyashita and Monzen (2001). These studies indicated that negative suggestions can affect physical behaviours, sensations and emotional feelings. However, they also indicated that negative suggestions can be limited in the extent of their success. Miyashita and Monzen (2001) concluded that, when investigating the influence of negative suggestion on body movement, the suggestions were more successful when

focused on a specific subject ('mono-dimensional behaviour') than when concerned with more general behaviour ('multi-dimensional behaviour'). For instance, a negative suggestion that "Your body does not move backward" would be more effective than the negative suggestion "Your body does not move" when body sway is measured.

The present study expanded the investigation of the effect of suggestion in séances to include a consideration of negative suggestion. During the course of the séance, a writing slate was moved a small distance across the séance table. As this was happening, the medium suggested to the participants that the slate remained stationary. As with the positive suggestion event, the negative suggestion was also paired with another event that was visually the same but was not commented upon. In this case the candlestick also moved but this was not mentioned by the medium. If the participants incorrectly reported that the slate did not move, but correctly reported that the candlestick did, the negative suggestion could be regarded as successful. If they reported that both objects moved, their reports of the séance would be accurate. Reports that neither of the objects moved would indicate that the participants were not reliable witnesses of the events. It was anticipated that there would be an effect of the negative suggestion, and that participants would incorrectly report that the slate remained stationary.

### **Effect of belief**

Gilovich (1991) reports that belief can bias expectations in two ways: firstly, people tend to attend to data that is consistent with their own views and ignore data that is not (selective attention); secondly, ambiguous data will be interpreted as being concordant with already held views (selective interpretation). Therefore, events will generally appear to confirm pre-existing views, and these views will rarely be challenged. Fiske and Taylor (1991) suggest, however, that the effects of selective attention are not as well established as those of selective interpretation. They report that some groups of people tend to be more selectively attentive than others, and that some stimuli arouse selective attention more than others. However, research appears to suggest that paranormal stimuli are successful in provoking selective attention, and that people who have strong beliefs about the paranormal will be selectively attentive to paranormal stimuli.

Wiseman and Morris (1995) showed participants films of apparently psychic demonstrations, and then asked them to complete a recall questionnaire. They found that participants who believed in the paranormal were less able than disbelievers to recall parts of the film which would indicate that the demonstration was not paranormal, although there was no difference in recall for 'neutral' events on the video. Smith (1993) found that participants who were told that they were watching a film of genuine paranormal phenomena could recall significantly less information about the events than participants who were told that they were watching trickery. Thus, it has been shown that paranormal phenomena may provoke selective attention, and that people with strong paranormal belief may be inclined to attend selectively to such phenomena.

Paranormal phenomena are also liable to selective interpretation. Marks (2000) suggests, for example, that people witnessing demonstrations of psychokinesis will interpret the cause (trickery or genuine powers) according to their existing beliefs. Another classic example of selective interpretation is shown in studies of astrology (e.g. Hines, 1988). These studies demonstrate that people will accept extremely general descriptions as being relevant to themselves, and that descriptions that are not concordant with a participant's personality are over-looked in favour of descriptions that match the personality. Jones, Russell and Nickell (1977) suggest that, beyond selectively attending to information and selectively interpreting it, people that believe in the paranormal will also attempt to create instances of paranormal phenomena, and thus misinterpret any events that coincide with these attempts as being paranormal. Zusne and Jones (1989) make the point that consistency in paranormal belief is important to people as that belief is not an isolated one. Often paranormal belief is part of a larger network of attitudes to factors such as religion and science and it is therefore advantageous to maintain an attitude to paranormal phenomena that is unchanging, and that conforms with other beliefs. It is, therefore, expected that belief in the paranormal will have an effect on the way in which individuals will attend to and remember apparently paranormal events.

It has also been shown that believers and disbelievers process information differently. In particular, believers in the paranormal will interpret phenomena in terms of the context

in which it is being presented, while disbelievers will analyse it independently of the context (Snel, van der Sijde, & Wiegant, 1995). The events of the séance room provide an excellent opportunity to test this concept. It was hypothesised that participants with strong paranormal belief would interpret the séance events as being of paranormal origin, and also that they might report events in addition to those controlled by the experimenters. In contrast, it was expected that disbelievers would reject the possibility that the events were paranormal, and only report those events which actually took place.

### **Interaction between suggestion and belief**

The séance study conducted by Wiseman, Seager and Smith (1997) found that the believers were more likely to accept a misleading during-event suggestion than the disbelievers. This is consistent with the hypothesis that belief will influence the way that people experience events. In particular, it provides evidence for an interaction between belief in the paranormal and susceptibility to suggestion. However, there are two possible explanations for the tendency of believers to accept the information suggested by the medium. The first is that believers are generally more suggestible than disbelievers, and therefore will accept information that is presented without questioning it. The second explanation is that believers accepted the suggestion because it was congruent with their existing beliefs. Sanbonmatsu et al.'s (1998) selective hypothesis testing theory would predict that, in cases of misinformation about movement of objects in the séance room, believers' perceptions would be more susceptible to distortion than disbelievers because they would not feel the need to question or analyse the information being presented. The disbelievers would consider the information in detail because it challenges existing beliefs, and therefore would be more likely to reject the suggestion. Thus, acceptance of the suggestion does not necessarily demonstrate a general susceptibility to suggestion. It may, instead, be symptomatic of selective interpretation of information. These two explanations are tested within the present study through the introduction of the negative suggestion.

The two previous séance studies conducted by Wiseman and colleagues tested the tendency of the believers to form opinions consistent with their beliefs but inconsistent

with what actually happened, and did not examine whether the same reaction is present with the disbelievers. This is generally true of the existing literature on self-confirming beliefs, which tends to focus on reporting errors made by believers, rather than by disbelievers. This may lead to conclusions that believers are more susceptible to suggestion than disbelievers. The present study sought to examine this by testing whether the disbelievers will also report a scenario consistent with their beliefs, even if it is discordant with what actually happened. The séance studies of Wiseman et al. (1995) and Wiseman et al. (1997) both examined suggestions that were likely to be accepted by the believers and rejected by the disbelievers, as they concerned apparently paranormal events. In this study, an additional factor was introduced – a suggestion that should be accepted by disbelievers and rejected by the believers. During the séances, an object was moved while it was suggested that the object was still stationary. It was hypothesised that the disbelievers would accept this suggestion, because it was concordant with their pre-existing belief that objects cannot move by paranormal means, whilst the believers would reject it.

Thus, an interaction between suggestion and belief is predicted for both forms of suggestion – positive and negative. In the positive suggestion condition, it is expected that the believers will show more acceptance of the suggestion than disbelievers. In the negative suggestion condition, acceptance of the suggestion by the disbelievers would indicate that suggestion acceptance is determined by existing views, rather than a susceptibility to suggestion in general. If, however, the believers showed as much, or more, suggestion acceptance as the disbelievers, it could be concluded that individuals who believe in the paranormal are more susceptible to suggestion than disbelievers.



## **METHOD**

### **Design**

The study examined the effect of paranormal belief on memory for the séance. This was a between-subjects variable. The IV was the level of paranormal belief, and participants were split into three groups – disbelievers, uncertain and believers – according to their responses to the belief question on the Initial Questionnaire.

Four dependent variables (DV) were measured. The first DV measured the extent to which participants accepted the ‘positive’ suggestion that the bell had moved. This was assessed by participant agreement (given by ticking Yes, Uncertain or No) with the statement ‘During the séance the bell moved’. The hypothesis was that participants who believed in the paranormal would show more belief that the bell moved.

The second DV assessed the extent to which participants accepted the ‘negative’ suggestion that the slate had not moved. This was assessed by participant agreement (given by ticking Yes, Uncertain or No) with the statement ‘During the séance the slate moved’. It was hypothesised that participants who did not believe in the paranormal would show more acceptance of this suggestion.

The third DV measured the degree to which participants experienced additional phenomena in the séance room. This was recorded by ticking Yes, Uncertain or No in response to the question ‘Did you experience any phenomena not mentioned above?’, then providing a brief written description of that phenomenon. It was hypothesised that participants who believed in the paranormal would provide more instances of additional phenomena.

The final DV assessed whether participants believed that the phenomena experienced were paranormal. This was recorded by ticking Yes, Uncertain or No in response to the question ‘Do you think that any of the phenomena that you experienced during the

séance were paranormal?’. The hypothesis was that participants who believed in the paranormal would be more likely to believe that the phenomena were paranormal.

### **Participants**

198 attendees of the Fortean Times UnConvention participated in 12 séances in groups of approximately 17, over the course of two days. Every participant was sent a follow-up questionnaire two weeks later, of which 125 returned the forms (a response rate of 63.13%). The mean belief scores of participants who returned the forms was 4.09 (std. dev. 1.82) and the mean belief of participants who did not return the forms was 4.25 (std. dev. 1.72). The non-returners were slightly more sceptical than participants that returned the forms, but this difference was not statistically significant ( $t(196df) = -.63, p(2t) = .53$ ).

### **Materials**

#### *Séance Room*

The séances were conducted in a room that was completely blacked out. All windows were covered by black material, and after the participants had entered the room the door was sealed. Participants were seated around one large, central table, surrounded by the same number of chairs as participants.

#### *Luminous objects*

A handbell, a maraca, a bamboo ball, a tambourine, a candlestick and a child’s drawing slate were all marked with small luminous dots (either luminous stickers or paint). These were placed on the séance table. The handbell was used for the positive suggestion, the tambourine was used as the positive suggestion control. The slate was used for the negative suggestion, the candlestick was used for the negative suggestion control. The ball was levitated during the course of the séance, but the maraca remained stationary throughout and was not referred to.

## *Questionnaires*

### Initial Questionnaire (see Appendix J)

This was distributed to participants at the start of the séances. It consisted of a brief definition of the term paranormal, and asked participants to answer the question “Do you believe that paranormal phenomena sometimes occur during séances?” on a seven-point scale, where 1 indicated ‘Definitely Yes’ and 7 indicated ‘Definitely No’. It then left space for participants to provide their name and address.

### Follow-up Questionnaire (see Appendix K)

This was sent to all participants two weeks after they attended the séances, along with a pre-paid reply envelope. The first section covered the events during the séance. Each of the objects on the table were listed in turn in the sentence “During the séance the xxx moved”, and participants were asked to tick Yes, No or Uncertain, to indicate whether they believed that the statement was correct. For each object, participants were provided with a space to provide a written description of what they remembered seeing. The second section asked three further questions, the first two of which were again responded to by ticking Yes, No or Uncertain, with an additional space underneath to provide further information. The first question asked whether the participants experienced any other phenomena during the course of the séance, and the second asked whether the participants believed the phenomena experienced to be paranormal. The final question asked whether participants had attended any previous séances at the UnConvention.

## **Procedure**

Participants gathered outside the séance room at an allotted time, and filed in around the table. They sat down and were asked to complete the initial questionnaire, which was then collected in. A brief introduction to the séance was then given by the ‘medium’. It was explained that the séance would take place in complete darkness, and participants were given the opportunity to leave if they felt uneasy. The luminous objects were then passed around the table, and all participants examined them. The lights were turned off and participants were asked to hold hands. Atmospheric music was played throughout

the course of the séance. The medium first asked participants to concentrate on attempting to move the ball, which was then seen to levitate several inches above the table, before slowly returning. Participants were then encouraged to move the tambourine, but it did not move. Next, attention was turned to the bell. This did not move, but the medium suggested that it was moving and encouraged the participants to move it further. The medium then asked the participants to concentrate on moving the candlestick. This moved a small distance across the table, but the medium did not refer to this movement. The group then began to concentrate on the slate. This moved a small distance across the table, but the medium suggested that it did not. The objects that did move during the séance were moved by a hidden assistant of whom the participants were not aware. The study was designed so that each suggestion was paired with a similar movement of an object, with a different verbal commentary. Thus, while the slate moved and the medium suggested it did not, the candlestick also moved and was not commented on. Similarly, the bell did not move but it was suggested that it had, and the tambourine did not move and this was not mentioned.

At the end of the séance, the lights were turned back on and the participants were thanked for attending. It was explained that they would be receiving the follow-up questionnaire in two weeks. Two weeks after the follow-up questionnaire was sent, all participants who attended the séance were sent a feedback report, explaining that the phenomena experienced were faked, and giving a summary of the findings of the study.

## **RESULTS**

Due to technical problems with the first two séances, the data from those participants were not used in analyses ( $N = 20$ ). Additionally, 5 participants indicated that they had attended the séances described in Wiseman et al. (1997) and their data were also excluded.

Participants were classified as believers, uncertain or disbelievers according to their answer to the paranormal belief question on the initial questionnaire. Participants who

recorded a score of 1-3 were classified as believers (N = 37), those giving a score of 4 were uncertain (N = 29) and 5-7 were disbelievers (N = 34).

### **Positive Suggestion – Movement of Bell**

Participants responded to the statement “During the séance the bell moved” by ticking either Yes, No or Uncertain. The majority of participants did not respond to the suggestion that the bell had moved.

A Chi Square showed that there was a significant interaction between paranormal belief and belief that the bell had moved (Chi Square (4df) = 9.1, p (2t) = .05. Table 4.1 shows the breakdown of participant responses.

BELL	BELIEVER	UNCERTAIN	DISBELIEVER	TOTAL
YES	7 (18.92%)	0 (0%)	4 (11.76%)	11 (11%)
UNCERTAIN	8 (21.62%)	3 (10.34%)	4 (11.76%)	15 (15%)
NO	22 (59.46%)	26 (89.66%)	26 (76.48%)	74 (74%)
TOTAL	37 (100%)	29 (100%)	34 (100%)	100 (100%)

Table 4.1: Numbers (and percentages) of Believers, Uncertain and Disbelievers responding Yes, No and Uncertain to the statement “During the séance the bell moved”.

### **Positive Suggestion Control – Movement of Tambourine**

Participants responded to the statement “During the séance the tambourine moved” by ticking either Yes, No or Uncertain. The majority of participants was accurate in their responses and did not report that the tambourine had moved.

A Chi Square showed that there was no significant interaction between paranormal belief and belief that the tambourine had moved (Chi Square (4df) = 4.11, p (2t) = .39. Table 4.2 shows the breakdown of participant responses.

TAMBOURINE	BELIEVER	UNCERTAIN	DISBELIEVER	TOTAL
YES	2 (5.4%)	4 (13.79%)	4 (11.76%)	10 (10%)
UNCERTAIN	4 (10.8%)	4 (13.79%)	8 (23.53%)	16 (16%)
NO	31 (83.8%)	21 (72.42%)	22 (64.8%)	74 (74%)
TOTAL	37 (100%)	29 (100%)	34 (100%)	100 (100%)

Table 4.2: Numbers (and percentages) of Believers, Uncertain and Disbelievers responding Yes, No and Uncertain to the statement “During the séance the tambourine moved”.

### Negative Suggestion – Movement of Slate

Participants responded to the statement “During the séance the slate moved” by ticking either Yes, No or Uncertain. Despite the fact that the slate had moved, participants mostly reported that it did not.

A Chi Square showed that there was no significant interaction between paranormal belief and belief that the slate had moved (Chi Square (4df) = .95,  $p(2t) = .92$ ). Table 4.3 shows the breakdown of participant responses.

SLATE	BELIEVER	UNCERTAIN	DISBELIEVER	TOTAL
YES	2 (5.41%)	1 (3.45%)	1 (2.94%)	4 (4%)
UNCERTAIN	3 (8.1%)	4 (13.79%)	3 (8.82%)	10 (10%)
NO	32 (86.49%)	24 (82.76%)	30 (88.24%)	86 (86%)
TOTAL	37 (100%)	29 (100%)	34 (100%)	100 (100%)

Table 4.3: Numbers (and percentages) of Believers, Uncertain and Disbelievers responding Yes, No and Uncertain to the statement “During the séance the slate moved”.

### Negative Suggestion Control – Movement of Candlestick

Participants responded to the statement “During the séance the candlestick moved” by ticking either Yes, No or Uncertain. Most participants accurately reported that the candlestick moved.

A Chi Square showed that there was no significant interaction between paranormal belief and belief that the candlestick had moved (Chi Square (4df) = 4.41,  $p(2t) = .35$ ). Table 4.4 shows the breakdown of participant responses.

CANDLESTICK	BELIEVER	UNCERTAIN	DISBELIEVER	TOTAL
YES	27 (73%)	26 (89.65%)	30 (88.24%)	83 (83%)
UNCERTAIN	5 (13.5%)	1 (3.45%)	2 (5.88%)	8 (8%)
NO	5 (13.5%)	2 (6.9%)	2 (5.88%)	9 (9%)
TOTAL	37 (100%)	29 (100%)	34 (100%)	100 (100%)

Table 4.4: Numbers (and percentages) of Believers, Uncertain and Disbelievers responding Yes, No and Uncertain to the statement "During the séance the candlestick moved".

### Other phenomena experienced

Participants were asked whether they experienced any other phenomena during the séance, and by ticking either Yes, No or Uncertain. The majority of participants did not record experiencing any additional phenomena.

A Chi Square showed that there was an interaction approaching significance between paranormal belief and experiencing of other phenomena (Chi Square (4df) = 8.78,  $p(2t) = .07$ ). Table 4.5 shows the breakdown of participant responses.

OTHER	BELIEVER	UNCERTAIN	DISBELIEVER	TOTAL
YES	12 (32.43%)	5 (17.24%)	3 (8.82%)	20 (20%)
UNCERTAIN	0 (0%)	1 (3.45%)	0 (0%)	1 (1%)
NO	25 (67.57%)	23 (79.31%)	31 (91.18%)	79 (79%)
TOTAL	37 (100%)	29 (100%)	34 (100%)	100 (100%)

Table 4.5: Numbers (and percentages) of Believers, Uncertain and Disbelievers responding Yes, No and Uncertain to the question of whether they experienced any other phenomena.

### Were the phenomena paranormal?

Participants were asked whether they believed that the phenomena experienced were paranormal, responding by ticking either Yes, No or Uncertain. The majority of participants did not believe that the phenomena were paranormal.

A Chi Square showed that there was a significant interaction between paranormal belief and belief that the phenomena were paranormal (Chi Square (4df) = 24.32,  $p(2t) = .0001$ ). The believers were more inclined to accept the phenomena as paranormal, or be uncertain. Table 4.6 shows the breakdown of participant responses.

PARANORMAL	BELIEVER	UNCERTAIN	DISBELIEVER	TOTAL
YES	9 (24.32%)	1 (3.45%)	1 (2.95%)	11 (11%)
UNCERTAIN	16 (43.24%)	11 (37.93%)	4 (11.76%)	31 (31%)
NO	12 (32.44%)	17 (58.62%)	29 (85.29%)	58 (58%)
TOTAL	37 (100%)	29 (100%)	34 (100%)	100 (100%)

Table 4.6: Numbers (and percentages) of Believers, Uncertain and Disbelievers responding Yes, No and Uncertain to the question of whether the phenomena were paranormal.

## DISCUSSION

The study was partially successful in terms of gaining the expected results. An examination of the belief data demonstrates that participants who expressed a prior belief in the paranormal were more likely to give a paranormal explanation, or record a level of uncertainty as to the cause of the phenomena experienced. The disbelievers rejected the paranormal explanation. This is in accordance with hypothesis, and demonstrates that participants will accept a rationale that is consistent with existing beliefs. Additionally, there was a difference approaching significance with regard to whether any additional phenomena were experienced. The majority of people who experienced additional phenomena were believers. This suggests that the expectations when entering the séance room were different for the two groups, with the believers showing, if not an expectation of phenomena, then a willingness to accept the possibility that phenomena might occur. There was also a significant effect in terms of acceptance



of suggestion that the bell moved. This also supports the idea that the believers were more open than the disbelievers to the idea of phenomena occurring in the séance room. However, there was no difference between the two groups in acceptance of the negative suggestion that the slate did not move. This may mean that the believers were equally likely to accept the suggestion as the disbelievers, implying, perhaps, that believers are generally more suggestible than disbelievers.

### **Effect of positive suggestion**

The results from the positive suggestion section of this study were unexpected. Most participants failed to report that the bell moved following the suggestion; this differs from both the results reported in Wiseman et al. (1997) and what would be expected in other suggestion studies. In the comparison of the tambourine and bell, more participants actually reported that the tambourine had moved (26%) than reported that the bell moved (11%). Thus, not only did the suggestion fail to positively influence reports of events; it actually appeared to have had an inhibitory effect. This is in accordance with the findings of Chapter 3, which found that misleading pre-event suggestion either has no effect or inhibits the likelihood that participants will perceive anomalous events. It is possible that, as the suggestion directly contradicted what the participants could see, they immediately rejected the idea and remembered this rejection two weeks later. However, this contradicts the results of the negative suggestion, where participants had the opportunity to see the slate moving, yet were willing to report that it had not.

One possible explanation for this lack of acceptance of the positive suggestion could be that there was a problem with visibility, and that participants were unable to establish whether objects were actually moving. However, examining participant responses to questions about the other objects present makes this unlikely. Most participants accurately report that the tambourine and maraca did not move (74% and 90% accuracy respectively), and that the candlestick and ball did move (83% and 71% accuracy). There were no differences in belief in any of these instances. Thus, in the case of objects where no suggestion was involved, participants were able to accurately assess the

movement of the object regardless of belief. This appears to rule out the notion that poor visibility may be responsible for both the lack of acceptance of suggestion that the bell moved and the widespread belief that the slate did not move.

Perhaps the low acceptance of the suggestion that the handbell moved is related to plausibility. It is possible that the participants rejected the idea that the bell moved because they did not hear the bell ringing, and thus did not believe that there could have been any movement. It should be noted that the participants in the séance all had a pre-existing interest in parapsychology or the paranormal, as they had chosen to attend a convention exploring the subject. Therefore, they may have been alert to the possibility that they were being manipulated and this may have caused them to reject the suggestion.

### **Effect of negative suggestion**

There appeared to be a strong effect of the negative suggestion, with most participants inaccurately stating that the slate had not moved. As mentioned previously, each suggestion event was matched to another in which the verbal commentary was different. Comparing the slate event to the candlestick event, it can be seen that the participants were far less accurate when considering the movement of the slate, as 86% incorrectly reported that it had not moved. This is compared to just 9% who said that the candlestick did not move (8% were uncertain). This would support the notion that the negative suggestion was effective in this study. The majority of suggestion studies are involved with examining whether participants respond to positive suggestion – that is, the suggestion that an event has taken place – with very little research considering suggestion that an event has not happened. There is clearly great potential for further research in this area.

### **Effect of belief**

The study has supported the concept that paranormal belief causes participants to selectively interpret ambiguous phenomena in order to correspond to their expectations. This was evident in the tendency of believers to report additional phenomena during the

séance, and to attribute the events to paranormal causes. In common with the studies described in Chapter 3, this study was effective in establishing that a person's prior beliefs will affect the way that they experience an event. The participants who believed in the paranormal were significantly more likely to accept the suggestion that the bell moved; they reported more additional phenomena taking place (although this was not quite significant); and they were more likely to believe that the phenomena were paranormal.

### **Interaction between suggestion and belief**

There was partial support for the selective attention hypothesis, which stated that a participant's belief in the paranormal (or lack thereof) would cause them to accept data that is consistent with their own views and reject data that is not. In the case of the positive suggestion, there was a significant interaction between suggestion and belief as participants with paranormal belief accepted the suggestion that the bell moved to a greater extent than participants who did not have paranormal belief. However, the case of the negative suggestion did not concur with this finding, as all belief levels accepted the suggestion equally. There are three possible explanations for this. Firstly, it may be that paranormal believers are globally more suggestible than disbelievers. Secondly, the selective attention hypothesis may be more relevant to participants with strong paranormal belief than those who do not believe in the paranormal. This view is supported by the findings of Russell and Jones (1980) that, when reporting apparently paranormal events, believers are likely to distort or reject information that is not congruent with their beliefs, whilst disbelievers report accurately, regardless of the content.

A third possible explanation is that the disbelievers were no more motivated than the believers to accept the negative suggestion. In the case of the positive suggestion (bell moving) the believers accepted the suggestion that the bell moved because it agreed with their expectations for the séance. However, the non-movement of the slate would not have confirmed disbelievers' expectations. During the course of the séance the disbelievers viewed the movement of other objects, and thus they could not maintain

any pre-existing opinions that no unusual events occur at séances. In other words, they could not infer from the negative suggestion that the events at the séance were not paranormal, whilst the believers may have inferred that the events were paranormal from the positive suggestion. Similarly, the believers had no motivation not to accept the negative suggestion. Their opinions were not threatened by accepting that one object had not moved, given that other objects did move. A more appropriate negative suggestion in this case would be one that concurred with the disbelievers' expectations about the paranormality of the events and challenged the expectations of the believers, rather than a suggestion concerning the movement of one object.

An interesting question is raised when studying during-event suggestion. Does the suggestion actually affect the perception of the event as it is happening, or is the suggestion effective in altering the memory of the event? Single-trace theories of misinformation effects preclude the possibility of suggestion affecting perception, as they work on the assumption that there must be an existing memory trace which is altered by the introduction of new information. However, multiple-trace theories which involve source confusion allow for the possibility of misinformation affecting perception. Participants are receiving two pieces of information at once – visual and audio. It is possible that one piece of information may alter the way the other piece of information is perceived; in effect, they experience source confusion between the two items.

Due to the nature of the testing in this study (one questionnaire administered two weeks later) it is not possible to say whether participants that did accept (either of) the suggestions had their perceptions of the event altered, or if their memories were affected by the suggestion at a later date. In order to test this, a series of studies were conducted in which participants were tested twice – once immediately after the suggestion and then again two weeks later.

## ***CHAPTER 5: THE EFFECTS OF DURING-EVENT SUGGESTION AND BELIEF ON REPORTS OF A KEY BENDING DEMONSTRATION***

### ***INTRODUCTION***

#### **Effect of suggestion**

The present experiments further explore the issue of suggestion taking place as an event is occurring. Participants were shown a videotape of a pseudo-psychic demonstration; in this case, a performer apparently using psychic ability to bend a key, then placing the key on the table in front of him where it lay stationary. Half of the participants then heard the performer suggest that the key was continuing to bend, whilst the other half saw the same scene but did not hear this suggestion. Participants were questioned about the event immediately afterwards, and two weeks later. Unlike studies in the existing literature examining during-event suggestion (e.g. Luchins & Luchins, 1969), there was no authority figure present (although one was viewed on the videotape) and no fear of social embarrassment which might influence answers – all responses were given on confidential and anonymous questionnaires. It was predicted that those who heard the suggestion would be more likely to report that the key had continued to bend. This could be because the suggestion will cause participants to misinterpret the ambiguous stimulus that they are viewing and believe that they can see the key bending. Alternatively, the suggestion may not affect the perception of the participant, but may affect their recollection of the event.

#### *Effect of suggestion over time*

The studies described in the present chapter also seek to examine whether misleading suggestion can have long-term effects beyond the initial presentation. If a person's perception of an event has not been initially altered by misinformation, can that misinformation still serve to alter their memories of the event? Traditional theories of misinformation suggest that there is an interaction between factors which combine to generate false memories. First, the participants must comply with misinformation, despite the fact that it may contradict their memory, then, over time, the misinformation

becomes incorporated into the memory (Brown, Goldstein, & Bjorklund, 2000). However, it is unclear whether this model would be appropriate for misinformation given as an event occurs, as it requires compliance which contradicts what the participant is actually witnessing. In traditional misinformation studies, the participant has no means to verify whether their memories are reliable or not; however, in during-event misinformation studies the participants should have the ability to disregard the misinformation as it opposes what they can see. Thus, the participants should retain two versions of the event – what they have actually witnessed, and what they have been told occurred. At some point in the future these may be confused in the memory, in the same manner as with misinformation given after the event. This would create a false memory of the event, despite an initial lack of acceptance of the suggestion. However, it seems intuitively unlikely that a participant who has actively rejected a suggestion would later incorporate it into memory. Indeed, Hyman and Kleinknecht (1999) specify that misinformation must be plausible and be accepted by the participant before it can be incorporated into memory. Therefore, it appears that in order for during-event misinformation to have a long-term effect, the participant should, at the very least, be unsure as to whether the event is actually happening. It would seem likely that existing beliefs may affect this perception to some extent.

Fuzzy trace theory (Brainerd, Reyna, & Poole, 2000) suggests that participants would form two distinct representations of the video – the verbatim trace and the gist trace. The verbatim trace would include the information that the key was bent by the performer and then placed on the table, and the performer said the key continued to bend. The gist trace would contain more general and vague information such as ‘the key was bent’. Brainerd et al. indicate that the verbatim trace fades faster than the gist trace, and after a period of time it is the gist trace that will be consulted when information is controlled. Given this information, it could be predicted that participants will have a less detailed memory of the video, and will be more likely to indicate that the key continued to bend, even if they did not originally see that happening. Hyman and Kleinknecht’s (1999) three processes theory would also predict reports that the key continued to bend after two weeks – providing the participants did not reject suggestion outright as they heard it. Hyman and

Kleinknecht indicate that if a suggestion is plausible and the participants construct a memory for it, they may experience source confusion at recollection and provide the misleading information rather than the original information. The source activation confusion model (Ayers & Reder, 1998) suggests that participants will have two separate recollections of the video – one for what they saw and one for what the performer said. The recollection that is most active at the time of testing will determine the responses provided.

However, there are other factors which may influence the way an occurrence is remembered. There is some evidence that repeating the false suggestion in the questions asked after seeing the video may serve to reinforce the false memory (Zaragoza & Mitchell, 1996). Also, Roediger, Meade and Bergman (2001) demonstrated that memory can be affected by statements from other people that erroneously describe scenes which participants have witnessed. They describe this as the ‘social contagion of memory’ – a person’s memory of an event can be influenced by even a brief discussion with another person. This idea was supported by Wright, Self and Justice (2000), who reported that after discussions between pairs of people who had been shown conflicting information, there was conformity between the pairs with regard to the sequence of events. This was true even when initial recollections of the stimulus were accurate. Wright et al. (2000) found that the most persuasive person in each pair was the person who showed most confidence that their memory was accurate, regardless of whether this was true. This finding has obvious ramifications for the present study, as most participants were in groups of friends, and had the opportunity to discuss their perceptions following the study. Additionally, Keuler and Safer (1998) demonstrated that recollection of an event is affected by the attitude of participants at the time that recall is taking place. For instance, participants awaiting examination results will recall being more anxious prior to the exam than participants who have already received their results. The current anxiety of the participants coloured their recall of their anxiety at the time. Thus, it is expected that the passage of time will have an effect on the degree to which participants believed the suggestion that the key continued to bend after being placed on the table.

### **Effect of belief**

It is also hypothesised that the participants' belief in the paranormal will affect the manner in which participants attend to the event and the way that they interpret it. Previous research indicates that people with strong paranormal belief may attend to situations differently from disbelievers (e.g. Jones & Russell, 1980). In the case of the present studies, participants may view the key bending differently because of their existing beliefs about psychokinesis. It is therefore anticipated that believers will be more likely to perceive the key as having continued to bend, regardless of whether they received the suggestion. This is because they will be motivated to perceive a paranormal event.

The interpretation of the event was assessed by the degree to which the participants believe that the key bend performed in the video was carried out by paranormal means. Wiseman and Morris (1995) found that participants reporting paranormal belief may be more likely to rate apparently psychic demonstrations as paranormal. This is in accordance with findings that people's pre-existing attitudes will affect the manner in which they perceive an event, because they are motivated to experience an event so that it conforms to their expectations (Ainsworth, 1998). Thus, it is expected that participants with belief in the paranormal will be more likely to view the bending of the key as paranormal, whilst those who do not believe will attribute the bending of the key to other causes. Marks (2000) describes this phenomenon as one of self-perpetuating beliefs – pre-existing expectations influence the way an event is viewed, which in turn strengthens the belief by confirming its accuracy.

### *Effect of belief over time*

It has previously been shown that the attitudes and expectations a person has will influence the manner in which they perceive an event. It is also true that these pre-existing biases can affect the way that they later remember the event. Bahrnick, Hall and Berger (1996) showed that memories for school performance become biased towards the outcome that the participant finds emotionally gratifying. In the case of the present study, this finding would predict that two weeks after viewing the video, the disbelievers



would rate the events in the video as not being paranormal, whilst the believers would show acceptance of the possibility that the events were paranormal.

### **Interaction between suggestion and belief**

Whilst it is expected that there will be a general effect of suggestion in the current study, it is also expected that participants will respond differently according to their belief in the paranormal. This is for two reasons. Firstly, previous studies investigating the link between paranormal belief and susceptibility to suggestion have indicated that there is a strong tendency for believers to be more suggestible. Wagner and Ratzeburg (1987) found a correlation between hypnotic suggestibility and paranormal belief. However, they queried whether this would necessarily predict a correlation between normal suggestibility and belief, as there was no research indicating that the two forms of suggestibility are related. Despite this, they concluded that both types of suggestibility involve imagination and acceptance of phenomena suggested by other people, so a correlation between suggestibility and paranormal belief may exist. This view was supported by Haraldsson (1985) who found a significant correlation between paranormal belief scores and scores on the Gudjonsson Suggestibility Scale (GSS) (Gudjonsson, 1984). The GSS measures ‘interrogative’ suggestibility and assesses participants’ tendency to respond to leading questions and change accounts of events as a response to pressure from an authority figure. As such, the GSS as a measure of suggestibility is more relevant to the current study than hypnotic suggestibility. Haraldsson (1985) suggested that the correlation between paranormal belief and suggestibility may be due to different means of information processing in believers and disbelievers.

Secondly, the suggestion in the present study is concerned with an apparently paranormal event and researchers have shown that perceptions of such events can be selectively processed according to belief. For instance, Russell and Jones (1980) found that those who believe in the paranormal are likely to distort or reject information that is not congruent with their beliefs, whilst disbelievers report accurately, regardless of the content. In the context of the current suggestion experiment, the tendency should be for the believers to accept the suggestion – regardless of whether or not it represents what

they are experiencing – because it confirms their beliefs about what should be taking place. The case of the disbelievers is less clear cut. The research suggests that they should report the event accurately; however, their accuracy will be largely determined by whether or not they believe the suggestion. Clearly, if they believe the suggestion that the key is continuing to bend they will not be able to accurately report the event. Wiseman and Morris (1995) showed participants a videotape containing pseudo-psychic trickery, and asked them to recall the events presented. They found that participants who did not believe in the paranormal were far more likely to notice important and detailed information about the demonstration on the video than participants who believed in the paranormal. If this holds true for the present study, it could be expected that the disbelievers would notice that the key was not actually bending and therefore would not accept the suggestion, while the believers would be more likely to endorse it.

### **Confidence**

Research examining the differences between real and false memories has commonly found that participants with false memories are significantly less confident than participants with real memories. Pedzek and Taylor (2000), in a review of the area, found that studies examining confidence all found this effect, although this was not always significant. Certainly, participants never showed more confidence in false memories than actual memories. As reports of false memories are generally less vivid, less detailed and have less clarity (Porter, Yuille, & Lehman, 1999), it is hypothesised these factors contribute to the difference in confidence. However, these studies all refer to false memories developed as a result of post-event misinformation, or implanted memories of events that never happened. There is no research that examines confidence for false memories developed from during-event suggestion. Also, research has only examined whether participants have more confidence for true or false memories. The present studies also aim to examine the influence of other factors on confidence, such as paranormal belief, and memories that are or are not congruent with existing beliefs.

### *Confidence over time*

There is some ambiguity about the effect that time should have on the confidence of participants. Zaragoza and Mitchell (1996) state that participants become more confident in their memories over time, but this study involved repeated exposure to misinformation resulting in a false memory. Therefore, participants could simply be more confident that they were supplying the answer required, rather than confident in their actual memory. Similarly, Cutler and Penrod (1995) reported that witnesses become more confident about their memories the more they are questioned. They also showed that the confidence of witnesses is extremely malleable and can be affected by factors such as the way that they are questioned, and evidence that other people agree with their memory of events. Thus, it would be expected that the participants who have had their recollection of the video confirmed by others, and who had described the events to others in the intervening two weeks, would display greater confidence than they had previously. However, as previously mentioned, confidence should also be affected by whether or not participants hold accurate or inaccurate memories.

There is also a strong possibility that the three factors of acceptance of suggestion, confidence and ratings of paranormality will interact when affecting the memories of participants. For example, a participant with strong belief in the paranormal who has received and accepted the suggestion may be more likely to go and discuss the video with friends than someone who was not motivated to believe the suggestion, or who did not receive it. Consequently, discussion of the video may increase confidence in the accuracy of their memory and their perceptions of whether the events shown in the video were paranormal.

It is therefore predicted that there will be a significant effect of suggestion on reports of whether the key continued to bend. There will also be a significant effect of belief, as participants with strong paranormal belief will be more motivated to witness a psychokinetic effect. In addition, there will be an interaction between belief and suggestion, as participants with paranormal belief will also be more motivated to accept the suggestion. Participants with paranormal belief should also be more likely to

interpret the events as being paranormal in origin. It is further hypothesised that participants will be less confident in their false memories than their real memories. It is anticipated that time will have an effect on these factors.

## ***STUDY 5.1***

### **METHOD**

#### **Design**

The study used a 2 x 2 x 2 mixed design. Factor One examined whether suggestion would influence participants' recollection of a video that they had viewed. This was a between-subjects variable with two levels: Suggestion (in which participants viewed a video containing the suggestion that a key continued to bend after being placed on a table) and No Suggestion (in which participants viewed a video that did not contain this suggestion). Factor Two examined the effect of paranormal belief on memory of the video and was a between-subjects variable. Participants were split into two groups – disbelievers and believers – according to their responses on the Belief in the Paranormal Questionnaire. Factor Three investigated the effect of time on recollection. This was a within-subjects variable, again with two levels: Time One (immediately after viewing the video), and Time Two (two weeks after viewing the video).

Three dependent variables (DV) were collected at each of the two times of questioning. The first DV measured the extent to which participants accepted the statement that the key had continued to bend. This was assessed by participant agreement with the key bending question, which read: 'After the key was placed on the table, it continued to bend'. This was rated on a seven-point scale – 1 = 'Definitely No' and 7 = 'Definitely Yes'. The hypothesis was that participants in the Suggestion condition, and participants who believed in the paranormal, would be significantly more sure that the key continued to bend, and that this difference would be more pronounced after two weeks.

The second DV assessed participants' confidence in the accuracy of their answer to the key bending question. This was measured on a seven-point scale (1 = 'Not at all confident' and 7 = 'Very confident'). It was hypothesised that participants who had reported false memories on the key bending question (i.e. that the key had continued to bend) would be less confident than those who reported true memories, and that this would be more evident two weeks later.

The third DV measured the degree to which participants believed that the key bending was paranormal. Participants recorded their answers to the question 'Do you think that the bending of the key was paranormal?' on a seven-point scale (1 = 'Definitely No', 7 = 'Definitely Yes'). It was hypothesised that participants who believed in the paranormal would provide higher ratings than participants who did not, and that the ratings would be higher after two weeks.

### **Participants**

46 people participated in this study, of whom 40 returned two weeks later. All participants were undergraduate Psychology or Cognitive Science students at the University of Hertfordshire. 23 participants were in the Suggestion condition, of whom 21 returned after 2 weeks. 23 participants were in the No Suggestion condition, of whom 19 returned after 2 weeks. All participants received course credits for their involvement.

### **Materials**

#### *Videos*

##### Suggestion Video (see Appendix L for transcript)

The Suggestion Video lasts for approximately two minutes, and consists of a performer appearing to bend a key. The video begins with a wide shot of the performer and an interviewer sitting at a table, on which several objects (cutlery, packs of cards, keys) are situated. The interviewer briefly points out the objects, then asks the performer to select an object. At this point, the camera shot changes to a close-up of the performer's hands selecting the key and, for the next ninety seconds, appearing to bend the key. Throughout the entire bending period, the performer's voice can be heard explaining

that the key is bending using psychic energy, and discussing the fact that he can feel heat coming from the key. After this period, the performer turns the key around in his hand, to demonstrate that it is bent, and places the key on the table. As the key lies on the table, the performer can be heard remarking that the key is continuing to bend. After fifteen seconds, he comments that it has finished bending. This suggestion is, in fact, false – the key did not continue to bend. The interviewer does not comment on the suggestion at any point.

### No Suggestion Video

The No Suggestion Video is identical to the Suggestion Video with the exception of the last fifteen seconds. After the key is placed on the table, the visual element of the video is the same, but there is no soundtrack suggesting that the key is continuing to bend.

### *Questionnaires*

#### Belief in the Paranormal Questionnaire (see Appendix M)

This questionnaire was devised by Wiseman and Morris (1995) and consists of six questions covering the participants' belief in telepathy, precognition and psychokinesis. For each question, participants state their level of belief by circling a response on a seven-point scale, where 1 is 'Definitely No' and 7 is 'Definitely Yes'. A seventh question on the Questionnaire lists seven possibly psychic experiences and asks participants to tick which (if any) they have experienced. For the purposes of the current study, participant's belief was measured by their responses to Questions 5 and 6, which concerned belief in psychokinetic phenomena. The two questions were: "Do you think that some people can, just by mental effort, apply a noticeable force to an object?" and "Do you think that some people can, just by mental effort, alter the physical characteristics of the material from which an object is made?".

#### Response Questionnaire (see Appendix N)

The Response Questionnaire consists of three statements relating to the video which are rated on a seven-point scale where 1 is 'Definitely No' and 7 is 'Definitely Yes'. For each of these questions, participants are also asked to rate their confidence in their

answer on a seven-point scale (1 = Not at all Confident, 7 = Very Confident). Question 1 asks whether the interviewer touched the objects on the table at the beginning of the film, and Question 2 asked whether the performer said that the key was heating up as he bent it. The third question is related to the suggestion, and reads:

‘After the key was placed on the table, it continued to bend’.

The fourth question asks participants whether they believe that the bending of the key was paranormal, and again is measured on a seven-point scale (1 = ‘Definitely No’ and 7 = ‘Definitely Yes’) with a seven-point confidence scale. The fifth question gives the participant some space to briefly provide an explanation for how they believe the key bent.

### **Procedure**

Participants were run in groups of up to five that had previously been assigned to either the Suggestion or No Suggestion condition. They were first issued with the Belief in the Paranormal Questionnaire, which they completed without time restrictions. Each participant was then asked to ensure that they could see the television screen clearly. When the experimenter was satisfied that all participants had clear views of the screen, the tape was started. Participants saw either the Suggestion or No Suggestion Video, depending on which condition they had been assigned to. After the video ended, participants completed the Response Questionnaire without time limits.

Participants were then asked to return two weeks later, and not to discuss the video with each other in the meantime. At the second session, participants were asked to fill in the Response Questionnaire again. After this was done, they were thanked for their time and then debriefed.

## RESULTS

Participants' score on the two Belief in the Paranormal Questions covering psychokinesis were used to classify them as believers or disbelievers. The scores ranged from 2 (strong sceptic) to 14 (strong believer). The overall mean score was 6.67 (std. dev. 3.2). Participants were split along the median – those scoring 6 and under were classified as disbelievers (N = 22; mean score 3.82, std. dev. 1.5), people scoring 7 and above were classified as believers (N = 24; mean score 9.29, std. dev. 1.76).

### Response to the key bending question

Participants' answers to the key bending question on the Response Questionnaire ('After the key was placed on the table, it continued to bend') were used to measure their acceptance of the suggestion. Responses were given on a seven-point scale where 1 indicated no agreement with the statement and 7 indicated strong agreement. This was recorded twice, immediately after viewing the video, and two weeks later. A 2 x 2 factorial Anova was conducted on the data recorded immediately after viewing the video, and this showed no significant effect of belief ( $F(1, 42) = .13, p = .72$ ), but a significant effect of condition ( $F(1, 42) = 17.17, p = .0002$ ). Participants in the Suggestion condition showed greater conviction that the key continued to bend. There was an interaction approaching significance between condition and belief ( $F(1, 42) = 3.56, p = .07$ ). The disbelievers gave higher scores than the believers in the Suggestion condition, but lower scores in the No Suggestion condition. Table 5.1 presents the results for the disbelievers and believers at Time One, split by condition.

TIME ONE	BELIEVERS	DISBELIEVERS	MEAN
SUGGESTION	3.43 (2.03) N = 14	4.56 (2.24) N = 9	3.87 (2.14) N = 23
NO SUGGESTION	2.3 (1.16) N = 10	1.54 (.97) N = 13	1.87 (1.1) N = 23
MEAN	2.96 (1.78) N = 24	2.77 (2.18) N = 22	2.87 (1.96) N = 46

Table 5.1: Mean scores (and standard deviations) for participant responses to the key bending question at Time One, separated by belief and suggestion.



### *Difference over time*

The data collected at Time One and Time Two were compared, in order to assess whether the responses changed over time. This analysis was conducted only on the responses provided by the 40 participants who attended both sessions. A difference in scores was calculated by subtracting responses provided at Time One from the responses provided at Time Two. Therefore, positive difference scores indicate that conviction that the key continued to bend increased over time. Negative difference scores indicate less conviction that the key continued to bend when questioned at Time Two. These data are represented in Table 5.2.

	BELIEVERS	DISBELIEVERS	MEAN
SUGGESTION	-.92 (1.31) N = 12	-.11 (1.45) N = 9	-.57 (1.4) N = 21
NO SUGGESTION	-.11 (.93) N = 9	.5 (.71) N = 10	.21 (.86) N = 19
MEAN	-.57 (1.21) N = 21	.21 (1.13) N = 19	-.2 (1.22) N = 40

Table 5.2: Mean (and standard deviation) difference in scores for Time One and Time Two, on answers to the key bending question.

A 2 x 2 factorial Anova demonstrated that this difference was almost significantly affected by condition ( $F(1, 36) = 3.78, p = .06$ ) and belief ( $F(1, 36) = 3.78, p = .06$ ), but that there was not a significant interaction between the two ( $F(1, 36) = .07, p = .79$ ). Participants in the Suggestion condition shifted more than those in the No Suggestion condition, and in the opposite direction – they were less likely to think that the key had continued to bend, while those in the No Suggestion condition were more likely to think it. This difference was replicated in the belief scores, with the believers changing their opinion more than the disbelievers, and away from the conclusion that the key continued to bend.

Tables 5.3 and 5.4 present the mean scores for each of the two instances of data collection, according to condition. The nonsignificant interaction between condition and

belief justifies the use of two further Anovas, examining the effect of belief when separated by condition. A 2 x 2 mixed Anova for participants in the Suggestion condition showed a significant effect of belief ( $F(1, 19) = 4.86, p = .04$ ) and an almost significant effect of time ( $F(1, 19) = 3.64, p = .07$ ), but no significant interaction between the two ( $F(1, 19) = 1.77, p = .2$ ). The disbelievers showed greater levels of conviction that the key continued to bend than the believers, and this belief was higher at Time One than Time Two. A second 2 x 2 mixed Anova examining the No Suggestion condition showed nonsignificant effects of belief ( $F(1, 17) = 2.34, p = .14$ ) and time ( $F(1, 17) = 1.26, p = .28$ ). The interaction between the two variables was also not significant ( $F(1, 17) = 2.64, p = .12$ ).

SUGGESTION	BELIEVERS	DISBELIEVERS	MEAN
TIME ONE	3.43 (2.03) N = 12	4.56 (2.24) N = 9	3.86 (2.03) N = 21
TIME TWO	2.42 (1.24) N = 12	4.44 (2.01) N = 9	3.29 (1.88) N = 21
MEAN	2.88 (1.38) N = 12	4.5 (2) N = 9	3.57 (1.83) N = 21

Table 5.3: Comparison of mean (and standard deviation) responses to the key bending question at Time One and Time Two, for participants in the Suggestion condition.

NO SUGGESTION	BELIEVERS	DISBELIEVERS	MEAN
TIME ONE	2.33 (1.23) N = 9	1.4 (.7) N = 10	1.84 (1.1) N = 19
TIME TWO	2.22 (.97) N = 9	1.9 (.99) N = 10	2.05 (.97) N = 19
MEAN	2.28 (1.01) N = 9	1.65 (.78) N = 10	1.95 (.93) N = 19

Table 5.4: Comparison of mean (and standard deviation) responses to the key bending question at Time One and Time Two, for participants in the No Suggestion condition.

## Confidence

For each question asked, participants also recorded their confidence in their answers on a seven-point scale. Confidence for answers to the key bending question was examined. A 2 x 2 factorial Anova conducted on the data recorded immediately after viewing the video showed no significant effect of belief ( $F(1, 42) = .264, p = .11$ ), and also no significant effect of condition ( $F(1, 42) = .29, p = .59$ ). There was an interaction approaching significance between condition and belief ( $F(1, 42) = 3.74, p = .06$ ). Thus, participants' responses were not influenced individually by the presence of suggestion or their belief in the paranormal, but when these factors combined, they may have had an effect. This was a result of the disbelievers in the Suggestion condition being less confident than those in the No Suggestion condition, while the believers in the Suggestion condition were more confident than their counterparts in the No Suggestion condition. Table 5.5 presents the confidence ratings immediately after viewing the video.

TIME ONE	BELIEVERS	DISBELIEVERS	MEAN
SUGGESTION	5.57 (1.55) N = 14	5.44 (1.42) N = 9	5.52 (1.47) N = 23
NO SUGGESTION	5 (1.63) N = 10	6.46 (.78) N = 13	5.83 (1.4) N = 23
MEAN	5.33 (1.58) N = 24	6.05 (1.17) N = 22	5.67 (1.43) N = 46

Table 5.5: Mean scores (and standard deviations) for participant confidence on the key bending question at Time One, separated by belief and suggestion.

Confidence was also examined with regard to whether participants answered Yes (a score of 5, 6 or 7 on the seven-point scale), No (a score of 1, 2, or 3) or Uncertain (a score of 4) to the key bending question. A factorial Anova showed no significant difference in the confidence of the three groups ( $F(2, 45) = .03, p = .97$ ). A comparison of those answering Yes and No (i.e. a comparison of false and actual memories) was also not significant ( $F(1, 40) = .05, p = .83$ ). Table 5.6 presents the confidence ratings separated by response to the key bending question.

	YES	UNCERTAIN	NO
TIME ONE	5.6 (1.08) N = 10	5.6 (1.94) N = 5	5.71 (1.49) N = 31

Table 5.6: Mean scores (and standard deviations) for participant confidence on the key bending question, separated by their responses to the preceding question.

### *Difference over time*

Again, data collected at Time One and Time Two were compared in order to assess whether the responses changed over time. Positive difference scores indicate that confidence increased over time. Negative difference scores indicate less confidence at Time Two. This difference in scores is shown in Table 5.7.

	BELIEVERS	DISBELIEVERS	MEAN
SUGGESTION	-.17 (1.95) N = 12	-.22 (1.48) N = 9	-.19 (1.72) N = 21
NO SUGGESTION	-.56 (.53) N = 9	-.6 (.7) N = 10	-.58 (.61) N = 19
MEAN	-.33 (1.49) N = 21	-.42 (1.32) N = 19	-.38 (1.31) N = 40

Table 5.7: Mean (and standard deviation) difference in confidence scores for Time One and Time Two.

A 2 x 2 factorial Anova demonstrated that the difference in scores was not significantly affected by condition ( $F(1, 36) = .79, p = .38$ ) or belief ( $F(1, 36) = .01, p = .9$ ), and that there was not a significant interaction between the two ( $F(1, 36) = .01, p = .98$ ).

Tables 5.8 and 5.9 present the mean scores for each of the two instances of data collection, according to condition. Again, two further 2 x 2 mixed Anovas were conducted. In the Suggestion condition, there were nonsignificant effects of belief ( $F(1, 19) = .02, p = .88$ ) and time ( $F(1, 19) = .24, p = .63$ ), and a nonsignificant interaction between the two variables ( $F(1, 19) = .01, p = .94$ ). In the No Suggestion condition, there were significant effects of belief ( $F(1, 17) = 5.62, p = .03$ ) and time ( $F(1, 17) = 16.35, p = .001$ ), but no significant interaction between the two variables ( $F(1, 17) =$

.02,  $p = .88$ ). Disbelievers were more confident in their answers than believers, and both sets of participants were more confident at Time One than Time Two.

SUGGESTION	BELIEVERS	DISBELIEVERS	MEAN
TIME ONE	5.57 (1.56) N = 12	5.44 (1.42) N = 9	5.38 (1.47) N = 21
TIME TWO	5.17 (1.85) N = 12	5.22 (.97) N = 9	5.19 (1.5) N = 21
MEAN	5.25 (1.41) N = 12	5.33 (.97) N = 9	5.29 (1.21) N = 21

Table 5.8: Comparison of mean (and standard deviation) confidence for the key bending question at Time One and Time Two, for participants in the Suggestion condition.

NO SUGGESTION	BELIEVERS	DISBELIEVERS	MEAN
TIME ONE	5 (1.63) N = 9	6.46 (.78) N = 10	5.83 (1.4) N = 19
TIME TWO	4.33 (1.8) N = 9	5.8 (1.14) N = 10	5.11 (1.63) N = 19
MEAN	4.61 (1.73) N = 9	6.1 (.94) N = 10	5.4 (1.53) N = 19

Table 5.9: Comparison of mean (and standard deviation) confidence for the key bending question at Time One and Time Two, for participants in the No Suggestion condition.

### Paranormality ratings

Participants' belief in the paranormality of the key bending was measured by their response to the paranormality question "Do you think that the bending of the key was paranormal?". This was measured on a seven-point scale where 1 indicated 'Definitely No' and 7 indicated 'Definitely Yes'. A 2 x 2 factorial Anova was conducted on the data provided immediately after viewing the video, and this showed no effect of suggestion ( $F(1, 42) = 1.09, p = .3$ ), but an effect approaching significance of belief in the paranormal ( $F(1, 42) = 3.43, p = .07$ ). Believers gave higher paranormality ratings than the disbelievers did. There was no interaction between the two variables ( $F(1, 42) = .97,$

$p = .33$ ). Table 5.10 gives the mean paranormality ratings for data provided immediately after viewing the video.

	BELIEVERS	DISBELIEVERS	MEAN
SUGGESTION	3.43 (1.79) N = 14	3 (1.8) N = 9	3.26 (1.76) N = 23
NO SUGGESTION	3.4 (1.27) N = 10	2 (1.63) N = 13	2.61 (1.62) N = 23
MEAN	3.42 (1.56) N = 24	2.41 (1.74) N = 22	2.94 (1.71) N = 46

Table 5.10: Mean scores (and standard deviations) for participant responses to the paranormality question at Time One, separated by belief and condition.

### *Difference over time*

Data collected at Time One and Time Two were compared in order to assess whether the responses changed over time. Positive difference scores indicate that paranormality ratings increased over time. Negative difference scores indicate lower paranormality ratings at Time Two. This difference in scores is shown in Table 5.11.

	BELIEVERS	DISBELIEVERS	MEAN
SUGGESTION	-.5 (1.62) N = 12	-.22 (1.2) N = 9	-.38 (1.43) N = 21
NO SUGGESTION	-.44 (.73) N = 9	0 (.47) N = 10	-.21 (.63) N = 19
MEAN	-.48 (1.29) N = 21	-.11 (.88) N = 19	-.3 (1.11) N = 40

Table 5.11: Mean (and standard deviation) difference for participant responses to the paranormality question for Time One and Time Two.

A 2 x 2 factorial Anova demonstrated that the difference in scores was not significantly affected by condition ( $F(1, 36) = .15, p = .1$ ) or belief ( $F(1, 36) = .99, p = .33$ ), and that there was not a significant interaction between the two ( $F(1, 36) = .05, p = .82$ ).

Tables 5.12 and 5.13 present the mean scores for each of the two instances of data collection, according to condition. A 2 x 2 mixed Anova conducted on the data for the Suggestion condition showed no significant effect of belief ( $F(1, 19) = .16, p = .7$ ) or time ( $F(1, 19) = 1.4, p = .25$ ) and no significant interaction between the two variables ( $F(1, 19) = 19, p = .67$ ). In the No Suggestion condition there was also no significant effect of belief ( $F(1, 17) = 1.43, p = .25$ ) or time ( $F(1, 17) = 2.3, p = .15$ ) and no significant interaction between the two variables ( $F(1, 17) = 2.56, p = .13$ ).

SUGGESTION	BELIEVERS	DISBELIEVERS	MEAN
TIME ONE	3.43 (1.79) N = 12	3 (1.8) N = 9	3.24 (1.79) N = 21
TIME TWO	2.92 (1.93) N = 12	2.78 (1.3) N = 9	2.86 (1.65) N = 21
MEAN	3.17 (1.7) N = 12	2.89 (1.45) N = 9	3.05 (1.56) N = 21

Table 5.12: Comparison of mean scores (and standard deviations) for participant responses to the paranormality question at Time One and Time Two, for participants in the Suggestion condition.

NO SUGGESTION	BELIEVERS	DISBELIEVERS	MEAN
TIME ONE	3.4 (1.27) N = 9	2 (1.63) N = 10	2.61 (1.62) N = 19
TIME TWO	2.89 (.93) N = 9	2.3 (1.77) N = 10	2.58 (1.43) N = 19
MEAN	3.11 (1.08) N = 9	2.3 (1.75) N = 10	2.68 (1.49) N = 19

Table 5.13: Comparison of mean scores (and standard deviations) for participant responses to the paranormality question at Time One and Time Two, for participants in the No Suggestion condition.

## DISCUSSION OF STUDY 5.1

The results for this study supported the hypothesis that participants in the Suggestion condition would show a greater degree of belief that the key had continued to bend after being placed on the table in both sets of responses. Initially, there was no effect of

paranormal belief, with disbelievers and believers showing the same degree of conviction that the key had continued to bend. This was contrary to the hypothesis that participants who believed in the paranormal would show greater belief that the key would continue to bend.

An analysis of the shift in responses after two weeks demonstrated that there were nearly significant effects of both belief and suggestion. The believers showed greater movement in responses than the disbelievers, and the Suggestion participants shifted more than the No Suggestion participants. However, both the believers and the participants in the Suggestion condition shifted their responses away from indicating that the key continued to bend. This was in contrast to the disbelievers and those in the No Suggestion condition, who showed slight shifts towards the conviction that the key continued to bend.

In the Suggestion condition, the disbelievers gave significantly higher responses to the key bending question than the believers at both times of questioning. There was also nearly a significant effect of time in the Suggestion condition, with participants showing greater belief that the key had continued to bend at Time One than Time Two. These effects were not evident in the No Suggestion condition, where responses were equal across belief and time.

Participants' confidence in their responses was not directly affected by either paranormal belief or the presence of suggestion when questioned immediately afterwards. There was, however, an interaction approaching significance between the two variables, with disbelievers in the Suggestion condition showing less confidence than disbelievers in the No Suggestion condition, and believers in the Suggestion condition showing more confidence than believers in the No Suggestion condition. There was no difference between believers and disbelievers, and Suggestion and No Suggestion participants when assessing the shift in confidence after two weeks. There was also no effect of belief or time on confidence in the Suggestion condition. However, in the No Suggestion condition the disbelievers showed more confidence than the



believers at both times of questioning. There was also a significant effect of time, with participants showing less confidence after two weeks.

The hypothesis that participants who indicated false memories (i.e. that the key continued to bend) would be less confident than those reporting accurately was not supported, as confidence was equal across these groups.

When participants were asked immediately after viewing the video if they thought the bending of the key was paranormal, there was a nearly significant effect of belief. The participants who believed in the paranormal showed greater conviction that the key bend was paranormal. This is in accordance with the hypothesis. There was no effect of suggestion in responses to the paranormality question. There was also no difference between the shifts in group responses after two weeks, and no effects of belief or time in either the Suggestion or No Suggestion conditions. This was contrary to the hypothesis that participants who believed in the paranormal would show greater belief that the key bend was paranormal after two weeks.

Responses to the key bending question showed support for the hypothesis that the presence of misleading suggestion would cause participants to express more conviction that the key continued to bend when questioned immediately after seeing the video. However, the hypothesis that belief would also affect response immediately afterwards was not supported. There was some support for the hypothesis that time would affect participants' responses, but this was not in the predicted direction. Acceptance of the suggestion was not greater after two weeks, and the believers were no more likely to say that the key had continued to bend than the disbelievers.

An interesting feature of the confidence ratings is that there is no significant difference in confidence for true and false memories. When questioned immediately after viewing the video, participants with false memories (i.e. they believed that the key had continued to bend after being placed on the table) were only slightly less confident than participants with true memories (i.e. they stated that the key did not continue to bend).

These findings are contrary to the established research, and the hypothesis that participants with false memories would be significantly less confident than those with true memories.

The results from this study were both unexpected and somewhat unclear. As a consequence of this, it was decided to attempt a replication of the study.

## ***STUDY 5.2***

Study 5.2 was an exact replication of the previous study using the same key bend video. The aim in conducting the study was to provide a clarification of the previous results; specifically, why the disbelievers were more accepting of the suggestion than the believers.

## **METHOD**

### **Design**

The study used a 2 x 2 x 2 mixed design. Factor One examined whether suggestion would influence participants' recollection of a video that they had viewed. This was a between-subjects variable with two levels – the presence or absence of suggestion. There were two conditions: Suggestion, in which participants viewed a video containing the suggestion that a key continued to bend after being placed on a table, and No Suggestion, in which participants viewed a video that did not contain this suggestion. Factor Two examined the effect of paranormal belief on memory of the video and was a between-subjects variable. Participants were split into two groups – disbelievers and believers – according to their responses on the Belief in the Paranormal Questionnaire. Factor Three investigated the effect of time on recollection. This was a within-subjects variable with two conditions: Time One (immediately after viewing the video), and Time Two (two weeks after viewing the video).

Three dependent variables (DV) were collected both times that the participants were questioned. The first DV measured the extent to which participants accepted the statement that the key had continued to bend. This was assessed by participant agreement (rated on a seven-point scale – 1 = ‘Definitely No’ and 7 = ‘Definitely Yes’) with the key bending question, which read: ‘After the key was placed on the table, it continued to bend’. The hypothesis was that participants in the Suggestion condition, and participants who believed in the paranormal, would be significantly more sure that the key continued to bend.

The second DV assessed participants’ confidence in the accuracy of their answer to the key bending question. This was measured on a seven-point scale (1 = ‘Not at all confident’ and 7 = ‘Very confident’). It was hypothesised that participants who had reported false memories on the key bending question (i.e. that the key had continued to bend) would be less confident than those who reported true memories.

The third DV measured the degree to which participants believed that the key bending was paranormal. This was recorded on a seven-point scale (1 = ‘Definitely No’, 7 = ‘Definitely Yes’) registering answers to the question ‘Do you think that the bending of the key was paranormal?’. It was hypothesised that participants who believed in the paranormal would provide higher ratings than participants who did not.

### **Participants**

100 participants were run in Study 5.2, of which 39 were male and 61 female. The mean age was 22.15 (std. dev. 5.44, with a range of 18-48). In the Suggestion condition 22 were male and 30 female with a mean age of 22.21 (std. dev. 5.55, range of 18-48), and in the No Suggestion condition 17 were male and 31 female with a mean age of 22.08 (std. dev. 5.38, range of 18-41).

25 of these participants returned two weeks later, of whom 5 were male and 20 female. The mean age was 20.8 (std. dev. 3.3, with a range of 18-34). In the Suggestion condition, 2 were male and 8 female with a mean age of 20.2 (std. dev. 2.04, range of

18-25), and in the No Suggestion condition 3 were male and 12 female with a mean age of 21.2 (std. dev. 3.95, range of 18-34).

### **Materials**

The materials were the same as those used in Study 5.1.

### **Procedure**

The procedure was the same as that of Study 5.1. However, in this study, returning after two weeks was voluntary. Consequently, the return rate was very low.

## **RESULTS**

Participants' scores on the two Belief in the Paranormal Questions covering psychokinesis were used to classify them as believers or disbelievers. The scores ranged from 2 (strong sceptic) to 14 (strong believer) (mean score was 7.14, std. dev. 3.2). Responses were split along the median – 7 and under were classified as disbelievers (N = 51; mean score = 4.49, std. dev. 1.65), 8 and above were classified as believers (N = 49; mean score = 9.9, std. dev. 1.74).

### **Response to the key bending question**

Participants' answers to the key bending question on the Response Questionnaire ('After the key was placed on the table, it continued to bend') were used to measure their acceptance of the suggestion. This was recorded twice, immediately after viewing the video, and two weeks later. The data for participant responses in both Suggestion and No Suggestion conditions immediately after viewing the video are shown in Table 5.14.

A 2 x 2 factorial Anova was conducted on the data recorded immediately after viewing the video, and this showed no significant effect of belief ( $F(1, 96) = .39, p = .53$ ), but there was a significant effect of condition ( $F(1, 96) = 26.44, p = .0001$ ), with participants in the Suggestion condition showing greater conviction that the key continued to bend. Thus, participants' responses were influenced by the presence of

suggestion, but not by their belief in the paranormal. There was no significant interaction between condition and belief ( $F(1, 96) = .16, p = .68$ ).

TIME ONE	BELIEVERS	DISBELIEVERS	MEAN
SUGGESTION	3.87 (2.19) N = 31	3.95 (2.46) N = 21	3.90 (2.27) N = 52
NO SUGGESTION	1.78 (1.01) N = 18	2.17 (1.21) N = 30	2.02 (1.14) N = 48
MEAN	3.10 (2.09) N = 49	2.9 (2.01) N = 51	3 (2.05) N = 100

Table 5.14: Mean scores (and standard deviations) for participant responses to the key bending question at Time One, separated by belief and suggestion.

### *Difference over time*

The data collected at Time One and Time Two were compared, in order to assess whether the responses changed over time. This analysis was conducted only on the responses provided by the 25 participants who attended both sessions. A difference in scores was calculated by subtracting responses provided at Time One from the responses provided at Time Two. Positive scores indicate increased conviction that the key continued to bend when questioned at Time Two. Negative scores indicate less conviction over time. Table 5.15 records this data.

	BELIEVERS	DISBELIEVERS	MEAN
SUGGESTION	-.5 (2.08) N = 4	-.5 (1.64) N = 6	-.5 (1.72) N = 10
NO SUGGESTION	0 (1.58) N = 9	-.17 (2.64) N = 6	-.07 (1.98) N = 15
MEAN	-.15 (1.68) N = 13	-.33 (2.1) N = 12	-.24 (1.86) N = 25

Table 5.15: Mean (and standard deviation) difference in scores for Time One and Time Two, on answers to the key bending question.

A 2 x 2 factorial Anova demonstrated that this difference was not significantly affected by condition ( $F(1, 21) = .26, p = .62$ ) or belief ( $F(1, 21) = .01, p = .92$ ), and there was not a significant interaction between the two ( $F(1, 21) = .01, p = .92$ ). Tables 5.16 and 5.17 present the mean scores for each of the two instances of data collection, according to condition.

SUGGESTION	BELIEVERS	DISBELIEVERS	MEAN
TIME ONE	3.25 (1.5) N = 4	5.83 (1.47) N = 6	4.8 (1.93) N = 10
TIME TWO	2.75 (2.87) N = 4	5.33 (2.36) N = 6	4.3 (2.75) N = 10
MEAN	3 (2.04) N = 4	5.58 (1.77) N = 6	4.55 (2.22) N = 10

Table 5.16: Comparison of mean (and standard deviation) responses to the key bending question at Time One and Time Two, for participants in the Suggestion condition.

Two 2 x 2 mixed Anovas examined the data for the Suggestion and No Suggestion conditions. In the Suggestion condition, there was an effect approaching significance of belief ( $F(1, 8) = 4.54, p = .07$ ), but no effect of time ( $F(1, 8) = .76, p = .41$ ) and no interaction between the two variables ( $F(1, 8) = .01, p = .99$ ). The disbelievers gave higher mean ratings than the believers. In the No Suggestion condition, there was no effect of belief ( $F(1, 13) = .003, p = .96$ ), time ( $F(1, 13) = .02, p = .9$ ) and no interaction between the variables ( $F(1, 13) = .02, p = .88$ ).

NO SUGGESTION	BELIEVERS	DISBELIEVERS	MEAN
TIME ONE	1.89 (1.05) N = 9	2 (.89) N = 6	1.93 (.96) N = 15
TIME TWO	1.89 (1.45) N = 9	1.83 (2.04) N = 6	1.87 (1.64) N = 15
MEAN	1.89 (.99) N = 9	1.92 (.86) N = 6	1.9 (.91) N = 15

Table 5.17: Comparison of mean (and standard deviation) responses to the key bending question at Time One and Time Two, for participants in the No Suggestion condition.

## Confidence

For each question asked, participants also recorded their confidence in their answers on a seven-point scale. Confidence for answers to the key bending question was examined. A 2 x 2 factorial Anova conducted on the data recorded immediately after viewing the video showed no significant effect of belief ( $F(1, 96) = .71, p = .4$ ), but a significant effect of condition ( $F(1, 96) = 15.11, p = .0002$ ), with participants in the Suggestion condition showing greater confidence than those in the No Suggestion condition. Thus, participants' responses were not influenced by their belief in the paranormal, but were strongly influenced by the presence of suggestion. There was no significant interaction between condition and belief ( $F(1, 96) = 1.22, p = .27$ ). The mean confidence for the key bending question immediately after viewing the video are shown in Table 5.18.

TIME ONE	BELIEVERS	DISBELIEVERS	MEAN
SUGGESTION	6 (1.18) N = 31	6.1 (1.45) N = 21	6.04 (1.28) N = 52
NO SUGGESTION	5 (2.03) N = 18	4.3 (2.2) N = 30	4.56 (2.14) N = 48
MEAN	5.63 (1.6) N = 49	5.04 (2.11) N = 51	5.35 (1.89) N = 100

Table 5.18: Mean scores (and standard deviations) for participant confidence on the key bending question at Time One, separated by belief and suggestion.

Participants were separated by response to the key bending question. Participants who gave ratings of 1 - 3 were classified as having answered No, ratings of 4 were classified as Uncertain and ratings of 5 - 7 were classified as Yes. A factorial Anova showed a nonsignificant difference in the confidence of the three groups ( $F(2, 99) = 2.64, p = .08$ ). A comparison of those answering Yes and No (i.e. a comparison of false and actual memories) was approaching significance ( $F(1, 80) = 3.2, p = .07$ ). Participants who responded Yes to the statement were more confident than those who responded No. Table 5.19 shows the confidence ratings separated by response to the key bending question.

	YES	UNCERTAIN	NO
TIME ONE	6.1 (1.24) N = 19	4.73 (2.2) N = 19	5.27 (1.9) N = 62

Table 5.19: Mean scores (and standard deviations) for participant confidence on the key bending question, separated by their responses to the preceding question.

### *Difference over time*

Again, data collected at Time One and Time Two were compared in order to assess whether the responses changed over time. Positive scores indicate more confidence at Time Two, negative scores indicate less confidence at Time Two. These data are shown in Table 5.20.

	BELIEVERS	DISBELIEVERS	MEAN
SUGGESTION	.75 (1.5) N = 4	.33 (1.63) N = 6	.5 (1.51) N = 10
NO SUGGESTION	-.44 (2.01) N = 9	.83 (1.6) N = 6	.07 (1.91) N = 15
MEAN	-.08 (1.39) N = 13	.58 (1.56) N = 12	.24 (1.74) N = 25

Table 5.20: Mean (and standard deviation) difference in confidence scores for Time One and Time Two.

A 2 x 2 factorial Anova demonstrated that the difference in scores was not significantly affected by condition ( $F(1, 21) = .22, p = .64$ ) or belief ( $F(1, 21) = .34, p = .56$ ), and that there was not a significant interaction between the two ( $F(1, 21) = 1.3, p = .26$ ). Tables 5.21 and 5.22 present the mean scores for each of the two instances of data collection, according to condition.

A 2 x 2 mixed Anova conducted on the data for the Suggestion condition showed no effect of belief ( $F(1, 8) = .16, p = .7$ ), time ( $F(1, 8) = 1.0, p = .35$ ) and no interaction between the variables ( $F(1, 8) = .17, p = .69$ ). A second 2 x 2 mixed Anova conducted on the data for the No Suggestion condition showed no effect of belief ( $F(1, 13) = 3.07, p = .1$ ), time ( $F(1, 13) = .02, p = .89$ ) and no interaction between the variables ( $F(1, 13) = 1.7, p = .22$ ).



SUGGESTION	BELIEVERS	DISBELIEVERS	MEAN
TIME ONE	5.5 (1.29) N = 4	5.33 (2.25) N = 6	5.4 (1.84) N = 10
TIME TWO	6.25 (.96) N = 4	5.67 (1.51) N = 6	5.9 (1.29) N = 10
MEAN	5.88 (.85) N = 4	5.5 (1.73) N = 6	5.65 (1.4) N = 10

Table 5.21: Comparison of mean (and standard deviation) confidence for the key bending question at Time One and Time Two, for participants in the Suggestion condition.

NO SUGGESTION	BELIEVERS	DISBELIEVERS	MEAN
TIME ONE	4.44 (2.01) N = 9	5.17 (1.6) N = 6	4.73 (1.83) N = 15
TIME TWO	4 (1.87) N = 9	6 (1.1) N = 6	4.8 (1.86) N = 15
MEAN	4.22 (1.66) N = 9	5.58 (1.11) N = 6	4.77 (1.58) N = 15

Table 5.22: Comparison of mean (and standard deviation) confidence for the key bending question at Time One and Time Two, for participants in the No Suggestion condition.

### Paranormality ratings

Participants' belief in the paranormality of the key bending was measured by their response to the paranormality question "Do you think that the bending of the key was paranormal?". This was measured on a seven-point scale where 1 indicated 'Definitely No' and 7 indicated 'Definitely Yes'. A 2 x 2 factorial Anova was conducted on the data provided immediately after viewing the video, and this showed no effect of suggestion ( $F(1, 96) = .48, p = .49$ ), but a significant effect of belief in the paranormal ( $F(1, 96) = 10.86, p = .001$ ). As with Study 5.1, believers gave higher paranormality ratings than the disbelievers did. There was no interaction between the two variables ( $F(1, 96) = .04, p = .98$ ). Table 5.23 gives the mean paranormality ratings for data provided immediately after viewing the video.

	BELIEVERS	DISBELIEVERS	MEAN
SUGGESTION	3.32 (1.35) N = 31	2.33 (1.59) N = 21	2.92 (1.52) N = 52
NO SUGGESTION	3.11 (1.78) N = 18	2.13 (1.22) N = 30	2.5 (1.52) N = 48
MEAN	3.25 (1.51) N = 49	2.22 (1.38) N = 51	2.72 (1.53) N = 100

Table 5.23: Mean scores (and standard deviations) for participant responses to the paranormality question at Time One, separated by belief and condition.

### *Difference over time*

A 2 x 2 factorial Anova demonstrated that the difference in scores was significantly affected by condition ( $F(1, 21) = 4.94, p = .04$ ), but not belief ( $F(1, 21) = .1, p = .75$ ), and that there was not a significant interaction between the two ( $F(1, 21) = .1, p = .75$ ). Participants in the Suggestion condition changed their scores more than those in the No Suggestion condition, and away from the possibility that the key bend was paranormal. The difference scores are shown in Table 5.24.

	BELIEVERS	DISBELIEVERS	MEAN
SUGGESTION	-1 (.82) N = 4	-1 (1.1) N = 6	-1 (.94) N = 10
NO SUGGESTION	0 (1.73) N = 9	.33 (.52) N = 6	.13 (1.36) N = 15
MEAN	-.31 (1.55) N = 13	-.33 (1.07) N = 12	-.32 (1.31) N = 25

Table 5.24: Mean (and standard deviation) difference in paranormality scores for Time One and Time Two.

Tables 5.25 and 5.26 present the mean scores for each of the two instances of data collection, according to condition. A 2 x 2 mixed Anova conducted on the data for the Suggestion condition found no effect of belief ( $F(1, 8) = .28, p = .61$ ), but a significant effect of time ( $F(1, 8) = 10, p = .01$ ). Participants rated the key bend as more paranormal at Time One. There was no significant interaction between the two variables ( $F(1, 8) = .01, p = .99$ ). A 2 x 2 mixed Anova conducted on the No Suggestion data

found no effect of belief ( $F(1, 13) = 1.09, p = .31$ ), time ( $F(1, 13) = 1.37, p = .72$ ), and no interaction between the two variables ( $F(1, 13) = .21, p = .66$ ).

SUGGESTION	BELIEVERS	DISBELIEVERS	MEAN
TIME ONE	3.75 (2.06) N = 4	3.17 (2.04) N = 6	3.4 (1.96) N = 10
TIME TWO	2.75 (1.5) N = 4	2.17 (1.47) N = 6	2.4 (1.43) N = 10
MEAN	3.25 (1.76) N = 4	2.67 (1.69) N = 6	2.9 (1.65) N = 10

Table 5.25: Comparison of mean scores (and standard deviations) for participant responses to the paranormality question at Times One and Two, for participants in the Suggestion condition.

NO SUGGESTION	BELIEVERS	DISBELIEVERS	MEAN
TIME ONE	2.78 (1.48) N = 9	1.83 (1.33) N = 6	2.4 (1.45) N = 15
TIME TWO	2.78 (1.79) N = 9	2.17 (1.6) N = 6	2.53 (1.69) N = 15
MEAN	2.78 (1.39) N = 9	2 (1.45) N = 6	2.47 (1.42) N = 15

Table 5.26: Comparison of mean scores (and standard deviations) for participant responses to the paranormality question at Times One and Two, for participants in the No Suggestion condition.

## DISCUSSION OF STUDY 5.2

The hypothesis that participants in the Suggestion condition would show greater levels of belief that the key continued to bend was supported. However, there was no effect of belief in the paranormal, contrary to the hypothesis that participants with greater paranormal belief would show more conviction that the key continued to bend. This positive effect of suggestion and lack of belief effect are in accordance with the results obtained in Study 5.1.

There was no effect of either belief or suggestion on shift in responses after two weeks. In the Suggestion condition, there was an effect approaching significance of belief, with the disbelievers showing more belief that the key continued to bend than the believers. However, there was no effect of time in either the Suggestion or No Suggestion conditions, and no effect of belief in the No Suggestion condition. Therefore, the hypothesis that believers and participants in the Suggestion condition would show more belief that the key continued to bend after two weeks than disbelievers and No Suggestion participants was not supported in either Study 5.1 or Study 5.2.

When examining the confidence scores, a significant effect of suggestion was found immediately after viewing the video, with participants in the Suggestion condition showing more confidence than those in the No Suggestion condition. The interaction between suggestion and belief was not significant. It is worth noting, however, that the interaction found in Study 5.1 (where disbelievers in the Suggestion condition showed less confidence than disbelievers in the No Suggestion condition) was not present in Study 5.2. Instead, disbelievers in the Suggestion condition showed greater confidence than those in the No Suggestion condition.

There was no effect of belief or suggestion on the shift in scores after two weeks, and neither the Suggestion nor the No Suggestion condition showed effects of belief or time. There was also no overall difference in confidence between participants who had answered Yes, No or Uncertain on the key bending question. However, there was an effect approaching significance when Yes and No responses were examined. Participants who had answered Yes showed more confidence than those who had answered No. This is contrary to the hypothesis that participants with accurate memories (i.e. those who answered No to the key bending question) would be more confident than those with inaccurate memories.

As with Study 5.1, the paranormality ratings provided by the participants show an almost significant effect of belief. The believers give higher responses to the paranormality question than the disbelievers. This is in accordance with the hypothesis.

It must be noted, however, that as with Study 5.1 no groups of participants show strong belief that the key bend was actually paranormal. There was no effect of suggestion upon responses to the paranormality question.

When examining the shift in responses over time, no effect of belief was found. There was a significant effect of suggestion, with participants in the Suggestion condition showing greater change in responses than those in the No Suggestion condition. However, the Suggestion participants shifted towards more negative responses, whilst the No Suggestion participants gave more positive responses.

In the Suggestion condition, there was no effect of belief on paranormality ratings, but there was an effect of time. Participants gave higher ratings at Time One than Time Two. There was no effect of either belief or time on paranormality ratings in the No Suggestion condition. Contrary to the hypothesis, participants did not increase their belief in the paranormality of the key bend over time.

The results for responses collected after two weeks are difficult to assess due to the extremely low response rate, but they do show broadly the same pattern as that witnessed in Study 5.1. Immediately after viewing the video, there was a strong effect of suggestion, but little effect of belief on answers to the key bending question and confidence. Belief did affect paranormality ratings, but suggestion did not in either study. Responses did not vary greatly over time for either of the three dependent variables, but where they did, the responses were lower for Time Two than Time One.

Studies 5.1 and 5.2 appear to provide some support for the multiple-trace theories of misinformation and false memory. Participants do appear to be accepting the suggestion that the key continued to bend, and this misinformation effect was still present two weeks later. However, contrary to expectations, there was no increase in acceptance of the suggestion after two weeks. With both studies, the confidence data did not support the hypothesis that participants with false memories would be less confident than those with true memories. This raises the issue of whether the questions that the participants

are being asked really assess their memories, and whether the responses recorded actually represent what the participants remember. This could also provide an alternative explanation for the tendency of disbelievers to appear to accept a suggestion contradictory to their beliefs. Does a positive response to the statement “After the key was placed on the table it continued to bend” really reflect a participant’s belief that they have seen this event, or rather indicate a recollection that this is what they were told?

The strategic effects explanation for the misinformation effect states that an effect of suggestion does not indicate that the participants have actually believed the misleading information. Instead, they could simply be providing the answer that is consistent with what they have been told, or they could be guessing the answer or providing the information they think that the experimenter wants (McCloskey & Zaragoza, 1985). In order to examine whether the during-event suggestion in the present study was actually affecting perception, a third study was designed. In this, participants would receive one of two different questionnaires, either the original presented to participants in the first two studies, or a new one asking participants to state specifically whether they saw the key continuing to bend.

### ***STUDY 5.3***

#### **INTRODUCTION TO STUDY 5.3**

McCloskey and Zaragoza (1985) questioned the traditional methods of assessing acceptance of suggestion. They commented that a difference in recollection between a control group and a group receiving a suggestion is not necessarily evidence that the memories of the experimental group have been substantially altered. They indicated that the experimental group will always perform worse than the control group when questioned on misleading information, as they have received and encoded information that the control group has not. It is also possible that participants may be responding in the way they think the experimenter expects, or simply guessing their answers. Therefore, McCloskey and Zaragoza (1985) indicated that apparent acceptance of

suggestion is not necessarily proof of memory impairment. This is known as the ‘strategic effects’ explanation of misinformation. This assertion was challenged by other researchers (e.g. Tversky & Tuchin, 1989). However, McCloskey and Zaragoza (1985) make a valid point – in order to draw conclusions from the false memory research, it is vital to ensure that false memories are actually being examined. As a consequence of this, many researchers have employed techniques that can demonstrate both memory impairment and misjudgment (e.g. Belli, 1989).

Additionally, Loftus (1996, in a review of the area) demonstrates that the wording of a questionnaire can have a strong influence on the information that is recalled. For instance, asking participants whether they saw ‘a’ broken headlight, as opposed ‘the’ broken headlight, can have significant effects on both accuracy and confidence of recall. Further, asking how small a person is (as opposed to how tall they are) produces significantly lower estimates of height, and asking how fast cars were going when they ‘hit’ each other elicits lower estimates than using the words ‘smashed’ or ‘collided’. Consequently, it can be seen that a participant’s response to a question is not necessarily an objective response based on their memory – it may be a subjective response based on the wording of the question.

Study 5.3 adapted this concept in order to assess whether participants were reporting what they had actually seen in the key bending video, or were merely repeating what the performer had said. In this study, the questions were examining whether acceptance of the suggestion altered participants’ perceptions of the event, or just the way that they reported it. This was achieved by giving half of the participants the original questionnaire (containing the statement ‘After the key was placed on the table, it continued to bend’) and the other half a new questionnaire stating ‘After the key was placed on the table, I saw it continue to bend’. If participants’ perceptions of events were altered by the suggestion, they would give equal responses to both questionnaires. However, if the participants were not reporting what they actually believed they had seen, the new questionnaire would receive substantially lower mean ratings.

## **METHOD**

### **Design**

The study used a 2 x 2 x 2 design. Factor One examined whether suggestion would influence participants' recollection of a video that they had viewed. This was a between-subjects variable with two conditions: Suggestion, in which participants viewed a video containing the suggestion that a key continued to bend after being placed on a table, and No Suggestion, in which participants viewed a video that did not contain this suggestion. Factor Two examined the effect of paranormal belief on memory of the video and was a between-subjects variable. Participants were split into two groups – disbelievers and believers – according to their responses on the Belief in the Paranormal Questionnaire. Factor Three examined the effect of question wording on response. This was a between-subjects variable with two conditions: Continued where participants responded to the statement 'After the key was placed on the table, it continued to bend', and I Saw, where participants responded to the statement 'After the key was placed on the table, I saw it continue to bend'.

Three dependent variables (DV) were collected. The first DV measured the extent to which participants accepted the statement that the key had continued to bend. This was assessed by participant agreement (rated on a seven-point scale – 1 = 'Definitely No' and 7 = 'Definitely Yes') with the key bending question. The hypotheses were that participants in the Suggestion condition, and participants who believed in the paranormal, would be significantly more sure that the key continued to bend. Additionally, it was hypothesised that the wording of the question would affect participants' responses – participants in the Continued condition would give higher mean responses than those in the I Saw condition.

The second DV assessed participants' confidence in the accuracy of their answer to the key bending question. This was measured on a seven-point scale (1 = 'Not at all confident' and 7 = 'Very confident'). It was hypothesised that participants who had reported false memories on the key bending question (i.e. that the key had continued to



bend) would be less confident than those who reported true memories, and that question wording would affect confidence.

The third DV measured the degree to which participants believed that the key bending was paranormal. This was recorded on a seven-point scale (1 = 'Definitely No', 7 = 'Definitely Yes') registering answers to the question 'Do you think that the bending of the key was paranormal?'. It was hypothesised that participants who believed in the paranormal would provide higher ratings than participants who did not.

### **Participants**

89 participants were run in this study. They were all undergraduate Psychology or Cognitive Science students at the University of Hertfordshire. 49 participants were in the Suggestion condition, of whom 25 received the Response Questionnaire and 24 received the Altered Response Questionnaire. 40 Participants were in the No Suggestion condition, of whom 19 completed the Response Questionnaire and 21 completed the Altered Response Questionnaire.

### **Materials**

The materials were the same as those used in Studies 5.1 and 5.2, with one addition.

#### Altered Response Questionnaire (see Appendix O)

This was identical to the Response Questionnaire, with the exception of the key bending question. The wording in this questionnaire was altered to:

'After the key was placed on the table, I saw it continue to bend'.

Participants who received the Response Questionnaire were assigned to the Continued condition, and those who received the Altered Response Questionnaire were assigned to the I Saw condition.

## **Procedure**

Participants in this study were run in groups of up to 20 that had previously been assigned to either the Suggestion or No Suggestion condition. The participants completed the BPQ, and were then asked to make sure that they could each see the television screen. It was explained to them that they would be asked to complete a questionnaire after watching the video, so they should watch carefully. Participants were then shown the videotape – either the Suggestion or No Suggestion video, according to the assigned condition. Afterwards, they were randomly given either the Response Questionnaire, or the Altered Response Questionnaire (the questionnaires were given out alternately) and asked to complete them. Participants were then thanked for their time and debriefed.

## **RESULTS**

Participants' score on the two Belief in the Paranormal Questions covering psychokinesis were used to classify them as believers or disbelievers. The scores ranged from 2 (strong sceptic) to 13 (strong believer) (mean score was 6.3, std. dev. 2.77). Participants were split along the median – those scoring 6 and under were classified as disbelievers (N = 22; mean score = 4.15, std. dev. 1.44), those scoring 7 and above were classified as believers (N= 23; mean score 8.71, std. dev. 1.7).

### **Response to the key bending question**

Participants' answers to the key bending question on the Response Questionnaire or Altered Response Questionnaire were used to measure their acceptance of the suggestion. The data for participant responses in both Suggestion/No Suggestion conditions for the I Saw condition are shown in Table 5.27. Table 5.28 contains the data for the Continued condition. Table 5.29 shows the overall means.

I SAW	BELIEVERS	DISBELIEVERS	MEAN
SUGGESTION	3.31 (1.8) N = 13	2.91 (1.51) N = 11	3.13 (1.65) N = 24
NO SUGGESTION	2.2 (1.03) N = 10	2 (1.48) N = 11	2.1 (1.26) N = 21
MEAN	2.83 (1.59) N = 23	2.46 (1.54) N = 22	2.64 (1.55) N = 45

Table 5.27: Mean scores (and standard deviations) for participant responses to the key bending question in the I Saw condition, separated by belief and suggestion.

A 2 x 2 x 2 Anova was conducted on the data and this showed no significant effect of belief ( $F(1, 81) = .93, p = .34$ ), but there were significant effects of both the Suggestion condition ( $F(1, 81) = 39.57, p = .0001$ ) and the Wording condition ( $F(1, 81) = 6.95, p = .01$ ). Participants in the Suggestion condition gave higher responses to the question than those in the No Suggestion condition, and participants in the Continued condition were more likely to say the key continued to bend than those in the I Saw condition. Thus, participants' responses were influenced by the presence of suggestion and the form of questioning, but not by their belief in the paranormal.

CONT.	BELIEVERS	DISBELIEVERS	MEAN
SUGGESTION	5.33 (2.06) N = 9	5.13 (1.99) N = 16	5.2 (1.98) N = 25
NO SUGGESTION	2.1 (1.45) N = 10	1.56 (1.01) N = 9	1.84 (1.26) N = 19
MEAN	3.63 (2.39) N = 19	3.84 (2.43) N = 25	3.75 (2.38) N = 44

Table 5.28: Mean scores (and standard deviations) for participant responses to the key bending question in the Continued condition, separated by belief and suggestion.

There was a significant interaction between the Suggestion and Wording conditions ( $F(1, 81) = 11.65, p = .001$ ), with participants in the I Saw/Suggestion condition giving lower responses than those in the Continued/Suggestion condition, but participants in

the I Saw/No Suggestion condition giving higher responses than the Continued/No Suggestion condition. There were not significant interactions between Wording and belief ( $F(1, 81) = .012, p = .913$ ) or Suggestion and belief ( $F(1, 81) = .01, p = .92$ ). There was no overall significant interaction between the Suggestion and Wording conditions and belief ( $F(1, 81) = .15, p = .7$ ).

	BELIEVERS	DISBELIEVERS	SUGGESTION	NO SUGGESTION	MEAN
MEAN	3.19 (2) N = 42	3.19 (2.15) N = 47	4.18 (2.09) N = 49	1.98 (1.25) N = 40	3.19 (2.07) N = 89

Table 5.29: Overall mean scores (and standard deviations) for participant responses to the key bending question, across both conditions.

### Confidence

A 2 x 2 x 2 Anova was conducted on the data and this showed no significant effect of belief ( $F(1, 81) = 1.88, p = .17$ ), Suggestion condition ( $F(1, 81) = 2.51, p = .12$ ) or Wording condition ( $F(1, 81) = .9, p = .35$ ). Participants' confidence was not influenced by the presence of suggestion, the form of questioning or their belief in the paranormal. Tables 5.30 and 5.31 show the mean confidence for the I Saw and Continued conditions. Table 5.32 shows the overall means.

I SAW	BELIEVERS	DISBELIEVERS	MEAN
SUGGESTION	5 (1.96) N = 13	5.36 (1.63) N = 11	5.17 (1.79) N = 24
NO SUGGESTION	5.6 (1.27) N = 10	6.09 (1.58) N = 11	5.86 (1.42) N = 21
MEAN	5.26 (1.69) N = 23	5.73 (1.64) N = 22	5.49 (1.65) N = 45

Table 5.30: Mean scores (and standard deviations) for participant confidence for the key bending question in the I Saw condition, separated by belief and suggestion.

There were no significant interactions between the Suggestion and Wording conditions ( $F(1, 81) = .09, p = .77$ ), Wording and belief ( $F(1, 81) = .03, p = .87$ ) or Suggestion and

belief ( $F(1, 81) = .45, p = .5$ ). There was also no significant interaction between the Suggestion and Wording conditions and belief ( $F(1, 81) = .24, p = .62$ ).

CONT.	BELIEVERS	DISBELIEVERS	MEAN
SUGGESTION	5.56 (2.07) N = 9	5.69 (1.78) N = 16	5.64 (1.85) N = 25
NO SUGGESTION	5.6 (1.58) N = 10	6.56 (.53) N = 9	6.05 (1.27) N = 19
MEAN	5.58 (1.77) N = 19	6 (1.5) N = 25	5.82 (1.62) N = 44

Table 5.31: Mean scores (and standard deviations) for participant confidence for the key bending question in the Continued condition, separated by belief and suggestion.

	BELIEVERS	DISBELIEVERS	SUGGESTION	NO SUGGESTION	MEAN
MEAN	5.4 (1.71) N = 42	5.87 (1.54) N = 47	5.41 (1.81) N = 49	5.95 (1.34) N = 40	5.65 (1.63) N = 89

Table 5.32: Overall mean scores (and standard deviations) for participant confidence for the key bending question, separated by the Suggestion condition and belief.

Confidence was also examined with regard to response to the key bending question. Participants who gave ratings of 1 - 3 were classified as having answered No, ratings of 4 were classified as Uncertain and ratings of 5 - 7 were classified as Yes. A factorial Anova demonstrated a significant difference in the confidence of the three groups ( $F(2, 88) = 6.19, p = .003$ ). However, a comparison of those answering Yes and No (i.e. a comparison of false and actual memories) was not significant ( $F(1, 72) = .39, p = .53$ ). Participants who were unsure whether the key had continued to bend were less confident, but those answering Yes and No showed confidence that was approximately the same. These data are shown in Table 5.33.

	YES	UNCERTAIN	NO
TIME ONE	5.76 (1.7) N = 21	4.44 (2.22) N = 16	5.98 (1.2) N = 52

Table 5.33: Mean scores (and standard deviations) for participant confidence on the key bending question, separated by their responses to the preceding question.

### Paranormality ratings

Participants' belief in the paranormality of the key bending was measured by their response to the paranormality question "Do you think that the bending of the key was paranormal?". This was measured on a seven-point scale where 1 indicated 'Definitely No' and 7 indicated 'Definitely Yes'. A 2 x 2 x 2 factorial Anova was conducted on the data provided, and this showed no effect of suggestion ( $F(1, 81) = .83, p = .37$ ), no effect of belief in the paranormal ( $F(1, 81) = .57, p = .45$ ), and no effect of Wording condition ( $F(1, 81) = .01, p = .91$ ). There were no significant interactions between the Suggestion and Wording conditions ( $F(1, 81) = .01, p = .91$ ), Wording and belief ( $F(1, 81) = .04, p = .85$ ) or Suggestion and belief ( $F(1, 81) = .21, p = .65$ ). The three variables did not significantly interact ( $F(1, 81) = .04, p = .85$ ).

Tables 5.34 and 5.35 show the mean response to the paranormality question for the I Saw and Continued conditions. Table 5.36 shows the overall means.

I SAW	BELIEVERS	DISBELIEVERS	MEAN
SUGGESTION	3.46 (1.51) N = 13	3.18 (.98) N = 11	3.33 (1.27) N = 24
NO SUGGESTION	3.1 (1.1) N = 10	3 (2.19) N = 11	3.05 (1.72) N = 21
MEAN	3.3 (1.33) N = 23	3.09 (1.66) N = 22	3.3 (1.49) N = 45

Table 5.34: Mean scores (and standard deviations) for the paranormality question in the I Saw condition, separated by belief and suggestion.

CONT.	BELIEVERS	DISBELIEVERS	MEAN
SUGGESTION	3.67 (1.12) N = 9	3.13 (1.15) N = 16	3.32 (1.15) N = 25
NO SUGGESTION	3.1 (2.13) N = 10	3 (2.06) N = 9	3.05 (2.04) N = 19
MEAN	3.37 (1.71) N = 19	3.08 (1.5) N = 25	3.21 (1.58) N = 44

Table 5.35: Mean scores (and standard deviations) for the paranormality question in the Continued condition, separated by belief and suggestion.

	BELIEVERS	DISBELIEVERS	SUGGESTION	NO SUGGESTION	MEAN
MEAN	3.33 (1.49) N = 42	3.09 (1.56) N = 47	3.33 (1.2) N = 49	3.05 (1.85) N = 40	3.2 (1.52) N = 89

Table 5.36: Overall mean scores (and standard deviations) for the paranormality question, separated by the Suggestion and belief.

### DISCUSSION OF STUDY 5.3

As with the first two studies, there was a strong effect of condition -- participants in the Suggestion condition showed a greater belief that the key continued to bend. This was in accordance with the hypothesis. Another finding similar to those found in Studies 5.1 and 5.2 was that, contrary to the hypothesis, there was no significant difference between disbelievers and believers in terms of acceptance of suggestion. However, the examination of questionnaire wording did show a significant effect and a significant interaction with suggestion. Overall, participants in the Continued condition gave a higher mean score on the key bending question than participants in the I Saw condition; this indicates that participants are differentiating between what they saw and what they are told, but will respond with what they were told if the question is not specific. Participants in the Continued condition were more likely to give a positive response than those in the I Saw condition when a suggestion had been received. However, in the No Suggestion condition, I Saw got a higher mean rating. This supports the notion that participants in the Continued condition were reporting what they were told, rather than what they believed that they saw. Therefore, the results are not solely an indication that

suggestion affects perception and recollection – there is also a response bias affecting reports of the video. This raises important questions about the concept of suggestion. Whilst it may appear that a suggestion has substantially altered a person's perception, the findings of this study indicate that this is not always the case; the participants are actually retaining two separate memories: one for what they saw occur, and one for what the performer said had occurred.

There was no interaction between paranormal belief and the I Saw/Continued conditions. Believers and disbelievers were equally likely to give higher ratings on the Continued questionnaire. This is contrary to the prediction that believers would be more motivated to state that they had seen the key continue to bend.

The confidence data did not show any effect of belief, or any differences between the Wording or Suggestion conditions. The lack of difference in the Wording conditions is interesting, as it appears that participants were confident in their responses, even if they were reporting something that they did not actually see. As previously mentioned, the Wording condition was assessing two different kinds of memory (memory for what was seen, and memory for what was said) and participants were equally confident for both kinds.

As with the previous two studies, there was no evidence that participants with false memories were less confident than those with true memories. In fact, they were equally confident, and significantly more confident than those participants who were unsure of whether the key continued to bend. This is contrary to the existing research indicating that false memories tend to be less vivid and detailed than actual memories, and therefore participants have less confidence in them.

There was no difference between believers and disbelievers when rating whether the key bend was achieved by paranormal means. Again, this is contrary to the hypothesis that believers would provide higher ratings than disbelievers. In fact, neither group was



convinced that the key was bent by paranormal means. There was also no effect of suggestion or wording on paranormality ratings.

This study has provided support for the strategic effects explanation of misinformation studies. Clearly participants did not simply indicate that they believed that the key continued to bend – the wording of the question was influential in eliciting responses. However, a significant effect of suggestion still remained after the question wording was changed, demonstrating that the results were not entirely influenced by strategic effects. Participants appeared to also have believed the suggestion, although to a lesser extent than previously indicated. This suggests that participants experienced a form of source confusion when viewing the video, and this caused them to actually perceive the event being suggested to them.

This study only tested responses immediately after viewing the video, and thus cannot be used to assess whether the suggestion actually affected memory rather than perception. Thus, a fourth study was conducted to examine responses two weeks later.

#### ***STUDY 5.4***

##### **INTRODUCTION TO STUDY 5.4**

This study attempted to combine the concepts explored in the previous two protocols. Firstly, it again examined whether participants would give different responses on the questionnaires testing perception impairment or reporting error. Secondly, it examined whether there would be a difference in response after a period of time. That is, this study questioned whether the reporting difference would still be apparent when participants were recording memories rather than perceptions. This was achieved by questioning participants two weeks after viewing the video. Unlike Studies 5.1 and 5.2, participants were not questioned immediately after viewing the video. This was to ensure that they were reporting their memories of the video, rather than memories of what they said in the first questionnaire. By testing participants two weeks later, it was hoped that theories

on the formation of false memories would be tested. Study 5.3 clearly demonstrated that participants held two separate perceptions of what had occurred (what they saw, and what they heard); after two weeks, would these still be separate, or would there be some transformation of memory? The various multiple-trace theories of memory indicate that, even if the suggestion did not cause participants to incorrectly perceive the event at the time, it may still affect memory afterwards although there is ambiguity as to how this may occur. The fuzzy trace theory (Brainerd, Reyna, & Poole, 2000) predicts that participants will have a less detailed memory of the video after two weeks, as they will be relying on gist information rather than verbatim information. They will, therefore, be more likely to indicate that the key continued to bend. Hyman and Kleinknecht's (1999) theory would also predict that participants will report that the key continued to bend after two weeks if they found the suggestion plausible at the time. The source activation confusion model (Ayers & Reder, 1998) suggests that participants will have two separate recollections of the video – one for what they saw and one for what the performer said. The recollection that is most active at the time of testing will determine the responses provided. It may be that the actual question in the testing stage will cause the memory of what the performer said to be activated. In this case, the SAC would also predict acceptance of the suggestion after two weeks.

One factor that was not tested in Study 5.4 was that of suggestion itself. Studies 5.1 to 5.3 all demonstrated that participants in the Suggestion condition recorded higher levels of belief that the key had continued to bend than participants in the No Suggestion condition. Therefore, all participants in Study 5.4 watched the Suggestion video.

## **METHOD**

### **Design**

The study used a 2 x 2 design. Factor One examined the effect of paranormal belief on memory of the video and was a between-subjects variable. Participants were split into two groups – disbelievers and believers – according to their responses on the Belief in the Paranormal Questionnaire. Factor Two examined the effect of question wording on

response. This was a between-subjects variable, with two conditions: Continued where participants responded to the statement ‘After the key was placed on the table, it continued to bend’, and I Saw, where participants responded to the statement ‘After the key was placed on the table, I saw it continue to bend’.

Three dependent variables (DV) were collected. The first DV measured the extent to which participants accepted the statement that the key had continued to bend. This was assessed by participant agreement (rated on a seven-point scale – 1 = ‘Definitely No’ and 7 = ‘Definitely Yes’) with the key bending question. The hypotheses were that participants who believed in the paranormal would be significantly more sure that the key continued to bend and that the wording of the question would affect participants’ responses – participants in the Continued condition would give higher mean responses than those in the I Saw condition.

The second DV assessed participants’ confidence in the accuracy of their answer to the key bending question. This was measured on a seven-point scale (1 = ‘Not at all confident’ and 7 = ‘Very confident’). It was hypothesised that participants who had reported false memories on the key bending question (i.e. that the key had continued to bend) would be less confident than those who reported true memories, and that question wording would affect confidence.

The third DV measured the degree to which participants believed that the key bending was paranormal. This was recorded on a seven-point scale (1 = ‘Definitely No’, 7 = ‘Definitely Yes’) registering answers to the question ‘Do you think that the bending of the key was paranormal?’. It was hypothesised that participants who believed in the paranormal would provide higher ratings than participants who did not.

## **Participants**

All participants were members of Art History Adult Education classes who voluntarily completed the study. 47 were run initially, of whom 42 returned after two weeks (a return rate of 93.33%). 39 of these were female and 3 were male. In the Continued

condition, 1 participant was male and 22 were female, and in the I Saw condition, 2 were male and 17 were female.

Of the 42 participants who returned after 2 weeks, the modal age group was 51-60, and ages ranged from the 31-40 age group to the 71+ group. In the I Saw condition, the modal age group was again 51-60, and ages ranged from the 31-40 age group to the 71+ group. In the Continued condition, ages ranged from the 41-50 group to the 61-70 group and the modal age group was 51-60.

### **Materials**

The materials were the same as those used in Study 5.3, with the exception of the No Suggestion video, which was not used.

### **Procedure**

Participants were run in groups of up to 16. All participants were shown the Suggestion video. After completing the Belief in the Paranormal Questionnaire and ensuring that they could all see the television screen, participants were shown the video. They were then told that the experimenter would return in two weeks to give them a questionnaire relating to the video, and were asked not to discuss the video until after that time.

The experimenter returned two weeks later and randomly distributed the Response Questionnaire and the Altered Response Questionnaire (the questionnaires were given out alternately). After completion, participants were thanked for their time and debriefed.

## **RESULTS**

Participants' score on the two Belief in the Paranormal Questions covering psychokinesis were used to classify them as believers or disbelievers. The scores ranged from 2 (strong sceptic) to 11 (strong believer) (mean score was 5.17, std. dev. 3.35). Responses were split along the median – 4 and under were classified as disbelievers (N

= 21; mean = 2.43, std. dev. .75), 5 and above were classified as believers (N = 21; mean = 8.43, std. dev. 1.99).

### Response to the key bending question

Participants' answers to the key bending question on the Response Questionnaire or Altered Response Questionnaire were used to measure their acceptance of the suggestion. The data for participant responses in the I Saw/Continued conditions are shown in Table 5.37.

A 2 x 2 factorial Anova found no effect of either belief ( $F(1, 38) = .17, p = .68$ ) or Wording ( $F(1, 38) = .22, p = .64$ ), and there was no significant interaction between belief and the Wording condition ( $F(1, 38) = .01, p = .99$ ). Participants gave similar responses to the question, regardless of belief or the form of questioning.

	BELIEVERS	DISBELIEVERS	TOTAL
I SAW	5.4 (1.84) N = 10	5.67 (1.94) N = 9	5.53 (1.84) N = 19
CONTINUED	5.64 (1.91) N = 11	5.92 (1.88) N = 12	5.78 (1.86) N = 23
TOTAL	5.52 (1.83) N = 21	5.81 (1.86) N = 21	5.67 (1.83) N = 42

Table 5.37: Mean scores (and standard deviations) for participant responses to the key bending question, separated by belief and condition.

### Confidence

A 2 x 2 factorial Anova found no effect of Wording condition ( $F(1, 38) = .02, p = .9$ ). There was, however, a significant effect of belief ( $F(1, 38) = 4.5, p = .04$ ). Disbelievers had more confidence in their answer to the key bending question than the believers. There was no significant interaction between belief and the Wording condition ( $F(1, 38) = .37, p = .55$ ). The mean confidence scores are shown in Table 5.38.

	BELIEVERS	DISBELIEVERS	TOTAL
I SAW	5.3 (1.95) N = 10	6.56 (.73) N = 9	5.89 (1.6) N = 19
CONTINUED	5.64 (1.91) N = 11	6.33 (.89) N = 12	6 (1.48) N = 23
TOTAL	5.48 (1.89) N = 21	6.43 (.81) N = 21	5.95 (1.51) N = 42

Table 5.38: Mean scores (and standard deviations) for confidence for responses to the key bending question, separated by belief and condition.

As with the previous studies, participant confidence was examined according to their response to the key bending question. Participants who gave ratings of 1 - 3 were classified as having answered No, ratings of 4 were classified as Uncertain and ratings of 5 - 7 were classified as Yes. A factorial Anova showed that there were significant differences between the answers of the three groups ( $F(2, 41) = 4.94, p = .01$ ). This difference was still evident when comparing those answering Yes and No (i.e. a comparison of false and actual memories) ( $F(1, 37) = 9.04, p = .005$ ). Participants answering Yes were far more confident than those answering Uncertain or No. The mean scores are shown in Table 5.39.

YES	UNSURE	NO
6.3 (.95) N = 33	4.75 (2.87) N = 4	4.6 (2.3) N = 5

Table 5.39: Mean scores (and standard deviations) for participant confidence on the key bending question, separated by their responses to the preceding question.

### Paranormality ratings

Participants' belief in the paranormality of the key bending was measured by their response to the paranormality question "Do you think that the bending of the key was paranormal?". This was measured on a seven-point scale where 1 indicated 'Definitely No' and 7 indicated 'Definitely Yes'. A 2 x 2 factorial Anova was conducted on the data provided, and this showed no effect of condition ( $F(1, 38) = .44, p = .51$ ) and no effect

of belief ( $F(1, 38) = .85, p = .36$ ). There was also no interaction between the two variables ( $F(1, 38) = .65, p = .43$ ). The mean responses to the paranormality question are shown in Table 5.40.

	BELIEVERS	DISBELIEVERS	TOTAL
I SAW	2.75 (1.67) N = 10	2.18 (1.72) N = 9	2.42 (1.68) N = 19
CONTINUED	3.13 (2.38) N = 11	2.6 (1.89) N = 12	2.78 (2.02) N = 23
TOTAL	2.94 (1.98) N = 21	2.42 (1.79) N = 21	2.62 (1.86) N = 42

Table 5.40: Mean scores (and standard deviations) for the paranormality question, separated by belief and condition.

## DISCUSSION OF STUDY 5.4

This study yielded some unexpected results. The first element of interest was that the distinction between the I Saw and Continued conditions was lost – participants in each condition were equally likely to believe that the key continued bending. This is contrary to the hypothesis that participants in Continued condition would give higher responses than those in the I Saw condition. This suggests that, after a time lapse, participants are no longer able to differentiate two separate memories of an event – what they saw and what they were told. Instead, the participants overwhelmingly reported what they were told, and confidently stated that they saw the key continue to bend. As with Study 5.3, there was no significant difference between believers and disbelievers in the two conditions. Although the disbelievers actually provided slightly higher ratings in both conditions, both believers and disbelievers gave high ratings for the key bending question.

Another point of note was that participants in this study give much higher mean responses than in the previous studies. This difference cannot be compared statistically, as the participants are from different samples. However, a possible explanation for this may be that these participants' recollection of the video was not tested immediately after

viewing, thus the testing at two weeks was the first time that they were asked to record their perception of what happened. This time interval may have allowed memories to become more distorted than those of participants who were asked to record their impressions immediately, as participants are now reporting what they remember occurring, rather than how they remember answering previously.

There was also no difference in paranormality ratings.

The confidence data showed that the disbelievers were significantly more confident than believers in both conditions. This is contrary to the findings from the previous three studies, and it is obvious that the difference is due to the disbelievers being extremely confident – their mean responses are far higher than responses from participants in the previous studies – rather than the believers being underconfident. This, again, supports the idea that the disbelievers are approaching the task as a magic trick, but does not explain why they are so much more confident than the believers. As with Study 5.3, there was no difference in confidence between the two wording conditions. However, in the previous study, this was seen to confirm the view that participants held two separate memories (what they saw and what they were told) and were equally confident of both. In the present study, there is no separation of the memories, and participants are extremely confident that the key continued to bend, regardless of the questioning used.

This study also found a significant difference between false and true memories. However, the difference is in the opposite direction to that expected – participants with false memories are more confident than those with true memories. This is consistent with the results in Study 5.2, where participants who answered Yes to the key bending question gave almost significantly higher confidence ratings than those who answered No.

There are some interesting implications of this study for theories of false memory. Firstly, it is possible that task demand effects may diminish over time. The lack of wording effect in this study suggests that after two weeks participants are not affected



by how a question is worded – they simply remember the misinformation as fact. There is support for both fuzzy trace theory and Hyman and Kleinknecht's (1999) theory, as both theories predicted that the suggestion would be magnified after two weeks.

### ***GENERAL DISCUSSION***

This series of studies has yielded some interesting insights into the area of suggestion and misperception. It has clearly demonstrated that giving a suggestion as an event is viewed will alter reports of that event. Whilst the initial change in report is not immediately enormous – generally developing responses from belief that the key did not continue to bend towards uncertainty – it introduces ambiguity into accounts of the videotape. Additionally, the results in Study 5.4 provide some indication that over time these reports become increasingly biased towards what the performer suggests, if participants are not tested initially on what they have seen. This supports findings by Wiseman and Lamont (1997) who record that members of the public viewing a magic trick (specifically the Indian Rope Trick) will confabulate the trick in their mind over time, so that it becomes increasingly impressive.

It is also worth noting that in Study 5.1, there was a tendency for participants in the No Suggestion group to become more likely to indicate that the key had continued to bend, when questioned after two weeks. It is possible that this is also due to an extremely subtle suggestion in the form of the Response Questionnaire – perhaps answering a question about whether or not the key did continue to bend introduced a possibility to them that they had not previously considered, and over time they became more uncertain as to whether this actually happened.

The results of Study 5.3 indicate that the suggestion from the performer does not always alter the perception of the participants. Immediately after viewing the video, they are clearly able to differentiate what they have actually seen from what the performer suggested. On a general level, this is an important demonstration of the necessity of precisely wording questions, so there is no disparity between what the experimenter

thinks they are asking, and what the participant is actually answering. Examining this series of experiments, the disparity between the I Saw and Continued conditions raises some interesting questions. If participants were aware that they did not see the key continue to bend, why did they respond positively to the statement that it had continued? It may be that, while the participants did not actually see the key moving themselves, they believed that it had continued to bend. Another possibility is that the participants misinterpreted the question and believed that they were being asked to record what the performer had actually said, rather than what they had seen. This provides some support for the strategic effects hypothesis as a partial explanation of misinformation effects. However, a significant effect of suggestion was present even after the strategic effects were controlled for.

Despite the initial disparity between the two wording conditions, the participants do appear to develop false memories of the event after a period of time. This was demonstrated in Study 5.4, in which all participants responded positively to the statement, regardless of which wording condition they were in. Thus, it is not necessarily important to change someone's perception of an event in order to distort their memories of it; it may only be necessary to introduce an alternative scenario, or an indication of what might be taking place. In this respect, during-event suggestion appears to act in the same way as post-event suggestion, and thus traditional misinformation theories are also relevant to during-event misinformation. It seems that during-event misinformation may act in two separate ways. Firstly, participants' perception of the event may be distorted by the suggestion. Secondly, the suggestion may affect memory over time, as participants become confused as to the source of the misinformation. However, the fact that this effect is shown more strongly in Study 5.4 than in either Study 5.1 or 5.2 suggests that false memories may become more developed if recollection of the event is not tested immediately.

Some of the most puzzling results in this series of studies are those regarding belief. In every study, the disbelievers were as convinced as, or more convinced than, the believers that the key continued to bend after being placed on the table. One possible,

albeit unlikely, explanation for this is that the disbelievers were actually so impressed by the demonstration that they changed their views on psychokinesis. This could easily be examined in future studies by giving a further test of belief after viewing the video. However, a more plausible explanation is that the demonstration in the video did not actually challenge their beliefs regarding psychokinesis. If the tape was viewed as a demonstration of a magic trick (rather than a genuine psychokinetic event), there was no logical inconsistency in the disbelievers accepting the suggestion that the key had continued to bend, as they had already accepted that the key had been bent by non-paranormal means. This is supported to some extent by the paranormality ratings, as the disbelievers consistently provided low scores.

Another possible cause of the lack of effect of belief is the conditions in which the videotape was being viewed. With the exception of Study 5.4, the experiments took place in a university laboratory, and all participants were undergraduates in psychology or associated subjects. In addition, the performer in the video was introduced by a psychologist (Richard Wiseman) who may have been known to the participants as a sceptic. Perhaps these conditions cued them to approach the task in a sceptical frame of mind? Another factor to bear in mind is the relative scarcity of people claiming PK powers in recent years. In the late 1970s, there were a number of psychic claimants receiving regular coverage in the media (Marks, 2000), but it is now far more common to see magicians performing similar tricks without claiming PK abilities. Thus, it may be that the participants are simply more used to viewing such demonstrations as magic tricks. If participants were approaching the demonstration as a magic trick, then testing their belief in psychokinesis would not be relevant, as at no stage would their beliefs regarding psychokinesis come into question.

Another unusual feature of this series of studies are the confidence responses. Each time the participants were questioned, their confidence in false memories was as strong (or stronger) than their confidence in true memories. This is contrary to the existing research on false memories, which indicates that confidence for true memories will be much higher. However, Loftus (1996) reports that research in eyewitness testimony is

not as clear cut. Witnesses may display high degrees of confidence, regardless of the accuracy of their response. This can be affected by factors such as the emotiveness of the situation, the time delay in questioning witnesses and the amount of questioning involved. It is possible that a situation involving during-event suggestion is closer to eyewitness testimony than to studies where false memories are implanted after an event has been witnessed. Additionally, there is some indication from the data in the present studies that confidence is not simply affected by whether a memory is true or false. The presence or absence of suggestion, and participants' belief in psychokinesis, also appear to have some effect on confidence for memory.

Despite the uncertainties regarding the effects of belief and confidence, this series of studies did demonstrate that during-event suggestion does significantly alter reports of an event. There are four possible explanations for this effect, which are not necessarily mutually exclusive. Firstly, the suggestion may cause participants to attend to a situation differently, altering their perception of what is occurring. Secondly, the suggestion may alter participants' interpretations of an ambiguous event. Thirdly, the suggestion may affect memory for an event, if not the initial perception of it. Finally, the suggestion may alter the way a participant reports an event, even if they have not accepted the suggestion and their perception and memory has not been affected.

The success of the during-event suggestion in these studies is an exciting finding which has not been previously researched in detail. It has obvious implications for the areas of testing psychic claimants and psychic fraud. However, there are also wider implications, as it is unlikely that this phenomenon is limited only to events regarding the paranormal. An interesting, and logical, next step would be to investigate this finding with regard to everyday events.

## **CHAPTER 6: CONCLUSION**

### **REVIEW OF RESULTS**

The first part of this section reviews the results found in each chapter. The effects of suggestion and paranormal belief and the interaction between the two factors are then considered in more detail.

Chapter 2 demonstrated that imagination inflation was a successful means of developing false memories for pictures. However, there was no interaction between false memory and paranormal belief. Chapter 3 investigated the effects of belief and suggestion on experiences in Hampton Court and found a significant effect of belief on unusual experiences. However, there was no effect of pre-event suggestion and no interaction between suggestion and belief. Chapter 4 examined during-event suggestion (positive and negative) and belief in the context of a séance room. There was an effect of negative suggestion and an effect of belief on experiences in the séance room. There was also an interaction between belief and positive suggestion. Chapter 5 assessed the effects of suggestion and belief on reports of a key bend. It found a significant and consistent effect of during-event suggestion on the reports, but no effect of belief and no interaction between belief and suggestion.

#### **Effects of imagination inflation and suggestion**

Chapter 2 utilised the phenomenon of source confusion developed as a result of imagination inflation in order to generate false memories. This was shown to be an extremely effective technique, with participants generating false memories for approximately one quarter of the words presented. All other studies used suggestion presented at different times as a means of false memory generation. The pre-event suggestion given in the second Hampton Court study was not shown to be a successful instrument for biasing perceptions of events. The lack of effect of pre-event suggestion may have been a function of the means by which the suggestion was imparted, or a reaction to the suggestion by the participants. Certainly, previous literature would

indicate that both perception and recollection of events can be affected by pre-event suggestion (e.g. Thorne & Himelstein, 1984; Rantzen & Markham, 1992). The effect of during-event suggestion on perception and recall was tested in Chapters 4 and 5. Chapter 4 showed a limited effect of positive suggestion on recall of events in the séance room, with only a few participants responding to the suggestion that a stationary object was moving. However, the majority of participants responded to the negative suggestion that a moving object was stationary. The first three studies in Chapter 5 demonstrated an overwhelming effect of during-event suggestion on reports of the key bending video. (Suggestion was not tested in Study 5.4). The introduction of the suggestion that the key continued to bend after being placed on the table caused a significant increase in reports that this actually happened.

### *Confidence ratings*

The results obtained in Chapter 2 corresponded with existing research indicating that confidence for false memories tends to be less than confidence for actual memories (e.g. Porter et al. 1999). In each of the three imagination inflation studies described in Chapter 2, participants recorded significantly less confidence for their false memories than for their actual memories. However, the key bending studies in Chapter 5 also tested confidence and did not find this effect. In Study 5.2 (Time One) there was an effect approaching significance indicating that participants were more confident in their false memories than their actual memories. This was also found significantly in Study 5.4. Studies 5.1 and 5.3 found no difference between false and actual memories.

### **Effects of paranormal belief**

The results of Chapter 2 indicated that belief in the paranormal correlates significantly with vividness of visual imagery and transliminality, and also suggested possible correlations with dissociate experiences and forgetting. The correlations with imagery, transliminality and dissociation were predicted from the previous literature; however, the indication that susceptibility to forgetting correlates with belief was unexpected and has not previously been investigated. Belief in the paranormal was found to be connected with experiencing of unusual phenomena in the second Hampton Court study

(Study 3.2), but not Study 3.1. In Chapter 4 there was an effect approaching significance of belief on whether the participants experienced any other phenomena in the séance room than that which the experimenters manipulated. The believers reported more additional phenomena than disbelievers. The key bending studies in Chapter 5 indicated little or no effect of belief on the tendency of participants to record the key as having continued to bend.

### *Paranormality ratings*

In studies which asked participants to rate whether the witnessed events were paranormal, it was anticipated that believers would give higher ratings than disbelievers. This is in accordance with research findings that events tended to be assessed according to preconceived ideas. In the Hampton Court chapter, both studies found that believers tended to give higher ghost ratings than disbelievers; that is, believers were more likely to assess their unusual experiences as being due to a ghost. In addition, believers in Study 3.2 had experienced significantly more previous anomalous experiences than disbelievers, and were more likely to anticipate an unusual event happening to them. Believers in the séance study (Chapter 4) gave significantly higher responses than disbelievers on the question of whether they felt the events in the séance were paranormal. In the key bending studies (Chapter 5) there was some further support for these findings, with believers giving higher paranormality ratings at Time One in both Studies 5.1 and 5.2. However, at Time Two in these studies and in Studies 5.3 and 5.4, there were no significant differences between believers and disbelievers.

### **Interaction between paranormal belief and false memory/perception**

In the imagination inflation studies of Chapter 2, only one study (2.1) indicated a correlation between false memory and paranormal belief. As previously discussed, this lack of correlation between the two factors in the imagination inflation paradigm is also evident in the studies of Blackmore and Rose (1997, and Rose & Blackmore, 2001).

The interaction between paranormal belief and susceptibility to suggestion was also not evident in the Hampton Court suggestion study (Study 3.2) (although this might be a

function of the fact that very few people responded to the suggestion at all in this study). In the séance study of Chapter 4, there was a significant interaction between paranormal belief and suggestion, with believers in the paranormal responding to the positive suggestion more than the disbelievers. However, the same effect was not present with regard to the negative suggestion. In that case, there was no difference between the believers, uncertain participants and disbelievers. The during-event suggestion in the key bending studies described in Chapter 5 also provided little support for an interaction between paranormal belief and susceptibility to suggestion. There was an almost significant interaction between them in Study 5.1 (Time One), but every other time the relationship was tested, no effect was found. One of the aims of this thesis was to examine whether a relationship exists between paranormal belief and susceptibility to false memory. The studies described appear to indicate that there is no such relationship.

## **METHODOLOGICAL ISSUES**

### **Measurement of paranormal belief**

A point of note in the thesis is that differing measures of belief have been used in each of the chapters. This may make it difficult to generalise across the thesis about the behaviour of ‘paranormal believers’ and ‘paranormal disbelievers’. It has been noted by researchers in paranormal belief that belief in one particular aspect of the paranormal does not necessarily generalise to global paranormal belief (Irwin, 1993). For instance, a participant may believe in séance room phenomena because they have strong religious beliefs including life after death. It does not follow, though, that the same individual will have a belief in other phenomena that could be termed psychokinetic, or indeed telepathy or clairvoyance. Therefore, when investigating the concept that perceptions and recollections of a particular event will be determined by pre-existing views, it is advantageous to be as specific as possible when assessing those views. Consequently, participants in Chapter 3, 4, and 5 were only classified according to their views on the subject being assessed.



With regard to the studies presented in Chapter 2, these followed on from Blackmore and Rose's (1997) claim that global paranormal belief will be related to false memory development. Tobacyk and Milford's (1983) Paranormal Belief Scale was used to assess paranormal belief. It is noted that the effectiveness of this scale has been questioned (e.g. Thalbourne, 1995) and it may therefore be appropriate to use a different scale (e.g. the Australian Sheep-Goat scale, Thalbourne & Delin, 1993) in future studies examining the relationship between false memory and paranormal belief. However, it should also be noted that both Thalbourne (1995) and Irwin (1985a) found significant correlations between the Paranormal Belief Scale and other measures of belief.

### **Methods of delivering suggestion**

Two interesting issues are evident with regard to the manner of suggestion delivery used within this thesis. The first is raised as a result of the disparity between positive effects of suggestion and lack of misinformation effect. The séance and Hampton Court studies found little or no positive effect of suggestion. This is in contrast to the key bending studies and the pre-event suggestions carried out by Lindsay and Johnson (1989b) and Rantzen and Markham (1992), which found effects even though the misinformation did not take the form of misleading post-event suggestion. This raises the question of whether the misinformation effect is primarily a laboratory-based effect, with little application in the real world? Studies of eye-witness testimony and false confessions (e.g. Loftus & Ketcham, 1991, 1994; Ofshe & Watters, 1994) indicate that this is not the case. They report findings that misleading suggestions can reliably and strongly influence memories outside an artificial laboratory situations. However, it should be noted that they were concerned with alteration to recollections of events. The suggestion in the Hampton Court studies (Chapter 3) and séance study (Chapter 4) involved alteration of event perception. It is therefore unclear whether the suggestion failed because the technique is not successful at affecting perception, or for different reasons involving the presentation and reception of the suggestion.

Secondly, both the Hampton Court and séance studies indicated a small (nonsignificant) inhibitory effect of suggestion, whereby participants in the suggestion condition

reported the desired event less often than those who did not receive the suggestion. It is worth considering whether there is a point at which the subtlety of a suggestion is lost and participants become aware that they are being manipulated. The existing literature has rarely considered this issue. There are two possible reasons for this. The first is that misinformation studies have tended to be small scale and involve substitution of one item for another, very similar item. For example, Loftus, Miller and Burns (1978) substituted a stop sign for a yield sign. This is in keeping with the suggestion of Hyman and Kleinknecht's (1999) that events should be plausible in order for misinformation to be effective. However, in contrast to this, Porter, Yuille and Lehman (1999) managed, through misinformation, to implant memories of a traumatic, large scale event. Another reason for the lack of related research is that misinformation has traditionally been concerned with memory for an event, rather than perception of it. In the situation where memory is being manipulated participants may query the inclusion of a misinformation item, but they have no means of testing their disagreement with it. When misinformation is used to attempt the alteration of the perception of an event, a participant has an immediate and effective way of ensuring that the suggestion is inaccurate. It may be, therefore, that an inhibitory effect of misinformation is a new finding directly related to the technique of perception alteration. This is clearly an area which requires further investigation.

### **'Real world' research**

It has often been remarked that investigations of human behaviour tend to be too reliant on laboratory-based studies and participants who are undergraduate (psychology) students (e.g. Myers, 1994). Coolican (1994) cites three major problems with this form of research. Firstly, it narrows the range of behaviour that can be studied. Secondly, individuals' behaviour within the laboratory studies is not necessarily indicative of their behaviour outside it. Thirdly, given the limitation in participant population and the artificiality of the situation, there are strong possibilities that results found inside a laboratory may not generalise to the rest of the population.

With this information, one of the strengths of this thesis is the fact that half of the studies described (2.3, 3.1, 3.2, 4, 5.4) took place using participants who were neither psychology students nor connected with a university. In addition, three of the studies (3.1, 3.2, 4) involved events which, while not mundane or everyday, more closely replicated situations in which individuals typically experience paranormal events. The séance and Hampton Court studies were closely related to circumstances that individuals who believe in the paranormal may seek out.

There are, however, additional problems attached to conducting experiments with volunteer participants outside of a university. The first is that the participants are, essentially, a self-selecting sample. It may be argued that an individual who voluntarily seeks out a study involving anomalous experiences is not typical of the population at large. For example, a disbeliever who attends a study on séances presumably has more interest in the area than a disbeliever who stays away. There is a possibility that a disbeliever attending such studies will either be less sceptical than the general population disbelievers, or more knowledgeable and critical than the general population. Therefore, whilst a study conducted outside the laboratory may provide results that are different from those obtained with student participants, the results may not, in fact, be any more generalisable to the population at large. It is true, however, that there may be a large overlap between people who attend paranormal studies and people who attend paranormal events. Therefore, the results obtained are probably closer to real life situations than any that could be obtained within the laboratory.

Other problems arising as a result of conducting field studies are those of time and participant motivation. Whilst the participants may enjoy the actual séance or ghost detection activity, they rarely have the time or motivation to fill in several personality variable questionnaires. It would have been of interest to investigate the link between experiences in the séance and Hampton Court with variables such as transliminality, imagery and dissociation. However, it simply was not practical or reasonable to expect participants to devote such large amounts of time to the studies.

## **IMPLICATIONS FOR FALSE MEMORY AND MISPERCEPTION RESEARCH**

The studies described within the thesis have considered various means for creating false memories and influencing perception of events through misinformation. The findings indicate that suggestion may be successful for a number of reasons. Firstly, the results of Chapter 5 demonstrate that part of the misinformation effect is due to task demands and the manner in which the participant is tested. This indicates that it is not necessary for memory or perception to be altered in order to affect responses. Secondly, suggestion is successful at affecting memory for an event, as an individual becomes confused as to the source of information. However, the findings from the thesis have also indicated that suggestion may be effective in altering the perception of an individual, and that this effect is not necessarily related to pre-existing beliefs.

Traditional theories of the misinformation effect have focused on explanations of how misinformation affects memories. It is worthwhile considering whether they allow for the findings that misinformation can also be effective in altering perception.

Hyman and Kleinknecht's (1999) explanation of the misinformation effect stated that three processes were required in order for suggestion to be effective. Firstly, the misinformation should be plausible; secondly, there should be construction of a false memory; thirdly, source confusion should take place. The fuzzy trace theory (FTT) and the source-activation confusion model (SAC) broadly supported this idea, indicating that false memory arises as a result of source confusion when two (or more) opposing representations of an event are in existence.

With regard to the three processes theory there are some points to consider. Firstly is the issue of plausibility. The prediction at the start of the research was that disbelievers would find the suggestions less plausible than believers, as they did not have a motivation to accept that paranormal phenomena were occurring. However, as has previously been discussed, they found the suggestions plausible because they did not believe that anything paranormal had occurred. Therefore, it is worth noting that

plausibility is a factor that is essentially defined by the participant rather than the experimenter.

The second process identified by Hyman and Kleinknecht was that of memory construction. Given that the key bending studies in Chapter 5 indicate that it is possible to alter accounts of events through during-event suggestion, it may be necessary to change this stage to ‘memory or perception construction’. However, there is some ambiguity about the degree to which perception is altered at the time. The questionnaire wording findings in Study 5.3 indicate that a small percentage of participants do genuinely believe that they have seen the key continue to bend. In this case, their perception has been altered and they will retain only one representation of the event in their minds. There is some confusion as to the position of the third process in this scenario – that of source confusion. Either the source confusion plays a part in the second process and is active in causing the perception construction, or the individuals bypass the source confusion stage. For other participants, there is an awareness that they received two distinct pieces of information – that which they saw, and that which they heard. Hyman and Kleinknecht’s theory predicts that they will still be able to form false memories of the event through source confusion, providing that they find the suggestion plausible. Therefore, the three processes theory offers an explanation of how during-event suggestion could alter recollections of an event, but needs to be clarified in order to explain how perceptions of the event could be changed.

The FTT suggests that for any event, two separate representations are encoded in the memory. Firstly, the verbatim trace exactly records what occurred, but is subject to fading. The gist trace is a general and vague account, often supported by related schemas, which remains over time and is increasingly consulted as the verbatim trace recedes. The FTT would predict that participants develop false memories as their consultation of the verbatim trace fades and is replaced by the gist trace. This is intensified by the fact that misinformation research typically involves substituting minor or irrelevant items and peripheral information is often stored in the gist trace rather than the verbatim trace which is concerned with the main information in a scene. The

misinformation studies described in Chapter 3 and 4 (séance and Hampton Court) involved suggestion for an important component of the scene and the FTT perhaps goes some way to explaining the lack of misinformation effect in these studies. In the key bending studies, the participants presumably found the actual key bend performed by the magician the central piece of action, with the events after the key was placed on the table less important. If this is the case, the FTT provides an explanation for why the suggestion was more successful in these studies. It also suggests that the misinformation could produce a false memory even if perception is not affected at the time. However, the FTT does not explain why the misinformation might change a participant's perception of the events as they happen.

The SAC model indicates that individuals will retain several memory traces related to various components of the event witnessed, and these traces will be connected to other memory traces with similar themes and qualities. Each time one of these traces is accessed, activation occurs in the related traces. The SAC model suggests that the memory trace most active at the time of testing is the one that will be accessed and reported. It should also follow that this trace will remain more active than the other traces which have not been accessed, and will therefore become the predominant memory trace for that particular event. In post-event misinformation studies, the SAC predicts that participants will retain memory traces of the correct information and the suggestion. However, because the suggestion is the most recent, and therefore most active, trace, it is accessed at the time of testing. Pre- and during-event suggestion will also be successful if something causes the misinformation trace to be more active than the correct information trace at the time of testing. However, if a participant's perception of an event is altered, there is presumably only one representation of the event in memory. There is, therefore, no possibility of accessing alternative traces which could create source confusion.

It appears that models describing the misinformation effect are successful in explaining how the misinformation can affect and remain in memory. This is true for pre- and during-event suggestion. However, they do not fully explain how misinformation can

cause a distortion in the perception of the percipient. There is an assumption that misinformation can only be effective in the memory, and not through any other cognitive processes. If the findings involving perception alteration can be replicated and extended, models of the misinformation effect will have to be revised in order to consider these new results.

## **IMPLICATIONS FOR PARANORMAL BELIEF RESEARCH**

This thesis has considered three possible explanations for the tendency of paranormal believers to experience more anomalous events than disbelievers. The first of these is that believers and disbelievers attend to situations differently, and thus believers will encounter more events which could be regarded as paranormal. This idea was supported by the tendency of believers in the séance and Hampton Court study to report more unusual events than disbelievers, despite the fact that the presented situation was the same for both groups.

The second explanation for the increased number of experiences of believers is that they interpret ambiguous stimuli differently from disbelievers. Specifically, the literature suggests that believers will interpret the stimuli in a manner that is congruent with their existing beliefs. This explanation was also supported by the studies in Chapters 3 and 4. Believers were more likely to rate events as being of a paranormal origin than disbelievers in both chapters. Although the actual origin of experiences in Hampton Court (whether paranormal, imagined or due to normal factors) could not be determined, all events in the séance study were controlled by the experimenters. It is clear, therefore, that attributions of paranormality by believers are not always reliable. This confirms previous findings indicating that believers will react according to their existing beliefs when assessing the situation (e.g., Russell & Jones, 1980; French, 1992a).

The third explanation is that believers in the paranormal are generally more suggestible than disbelievers. This hypothesis was not corroborated by the research described within the thesis. Little evidence was found to support this idea, with the anticipated effect

occurring only once, in the séance study of Chapter 4. This is despite the studies by Wagner and Ratzeburg (1987), Atkinson (1994) and Irwin (1989) indicating that such a relationship exists. Although the believers did occasionally accept suggestion to a greater degree than disbelievers, this may be a consequence of the material used to administer the suggestion. Acceptance of a suggestion about paranormal events may be due to selective interpretation rather than a general suggestibility.

Blackmore and Rose (1997) suggested that believers in the paranormal would be more susceptible to false memory than disbelievers. This hypothesis was supported by research indicating that paranormal belief and false memory should both be associated with higher levels of visual imagery, dissociation and transliminality. The studies in Chapter 2 found the reported link between belief and vividness of visual imagery, and also some evidence for belief correlating with dissociative experiences, transliminality and forgetting. However, the lack of correlations between these factors and false memory development means that, although there was no link between belief and false memory, the possibility that it does exist cannot be ruled out. It is possible that the types of false memory that do correlate with those personality variables are not the same as the type investigated in the Chapter 2 studies. Therefore, further research considering other forms of false memory development should be conducted to further investigate this area.

Therefore, the research presented within the thesis indicates that believers are not as prone to false memory generation and suggestibility as previously assumed. However, there is scope for research examining whether believers report experiencing paranormal phenomena simply as a function of their existing attitudes towards the event. This supports the idea forwarded by Zusne and Jones (1989) that consistency in paranormal belief is important as it is part of a larger network of attitudes to factors such as religion and science, and maintenance of paranormal belief ensures unanimity in other beliefs.



## **FUTURE RESEARCH**

### **Imagination inflation and paranormal belief**

The central argument of Blackmore and Rose's (1997) paper was that people who believe in the paranormal will be more susceptible to false memory because they confuse reality and imagination. Although this relationship was not found using the word/photographs paradigm, it may be present in other scenarios. Two potential areas of research are using imagination inflation for apparently paranormal events and for autobiographical events. It would be interesting to ask participants to imagine events such as witnessing a ghost or experiencing a telepathic occurrence. If believers were seen to show more acceptance of these imaginings as real, Blackmore and Rose's hypothesis would be supported in part. Although believers may not have a global susceptibility to imagination inflation, it may be a factor in specific belief-confirming situations. With regard to autobiographical events research, testing participants with situations such as the 'lost in a mall' (Loftus & Pickrell, 1995) study or the diary study of Loftus and Polage (1999) would provide valuable insights. It has been established that paranormal believers have a tendency to misinterpret data as providing evidence for their beliefs, but testing them on real-life events would investigate whether they really do have a tendency to imagine events that did not happen, or distort recollections of events that did happen. Examining the relationship between belief in the paranormal and susceptibility to source confusion in those situations would provide clarification as to the existence of the relationship between the two factors.

### **Misperception and false memory**

The key bending studies described in Chapter 5, and the séance study in Chapter 4, began to investigate the effects of misleading during-event suggestion on both perception of events and recollection of them. They were successful in demonstrating that during-event suggestion can affect reports of events, and that this can occur independently of existing beliefs. This is an important finding that should be investigated further. Of particular interest were the indications from Study 5.3 that suggestion can affect perception of events even after wording effects are controlled for,

and from Study 5.4 that there may be a greater level of suggestion acceptance after a period of time, if recollection is not tested in the meantime. A major study that should be conducted is one that assesses the combined effects of these factors. The paradigm of Studies 5.1 and 5.2, in which participants are tested on their suggestion acceptance at two stages could be extended, such that questionnaire wording is also considered, and a further group of participants are only tested at the second stage of questioning. This would overcome the difficulties of Chapter 5 in which participants from the separate studies were drawn from different population samples and therefore their results could not be considered in conjunction. A particularly interesting concept to investigate is whether it is necessary to perceive an event according to misinformation in order to later develop a false memory of it.

### **Negative suggestion**

The séance study described in Chapter 4 indicated that a suggestion referring to a lack of an event as it happens can affect perception and/or recollection of that event. This is an area that has not been widely researched and offers potential for further study. It would be interesting to assess whether negative suggestion is also successful in changing participants' reports of situations that have already occurred (post-event suggestion) and of events that are about to occur (pre-event suggestion).

### **Attribution of ostensibly paranormal events**

A finding that seemed apparent in both the séance and key bending chapters is that participants did not always make the expected attributions about the events that they were witnessing. In particular, the disbelievers were often willing to accept the apparent success of paranormal events because they were making different assumptions as to the cause of the event. It was expected that they would reject suggestions that challenged their view that paranormal events do not exist; however the suggestions that they witnessed did not provide the necessary conflict. Instead, they rejected the notion that the events were paranormal and viewed them as plausible magic tricks. It is possible that these attributions could be affected by varying the situations in which the event is presented. For instance, showing individuals footage of psychic or psychokinetic

claimants before they participate may cause them to make different attributions than participants who have been shown footage of magicians performing similar feats. Additionally, there may be cultural and generational differences in the attributions. Participants who are familiar with claims of psychokinesis and séance phenomena may be more accepting of the claims than those with more familiarity of magical effects. For instance, individuals who witnessed the rise of Uri Geller's spoon-bending claims in the 1970s (Marks, 2000) may be more inclined to accept all claims of psychokinesis as true.

### **Effect of participation on belief**

None of the studies described within this thesis considered whether the act of participating in the study could have affected belief in the paranormal. In the Hampton Court studies (Chapter 3) and the séance study in Chapter 4 it would have been an interesting addition to the data, particularly as the séance responses were collected two weeks after participating. There is a possibility that the participants may have had their belief affected either positively or negatively by the situation and this, in turn, may have affected the responses that they provided. Any future studies would be enhanced by a consideration of whether belief in the paranormal remains stable over the course of the participation.

### **Misinformation over time**

Studies investigating laboratory-elicited false memory and autobiographical false memory have reached differing conclusions about the effects of time on memory. Payne, Elie, Blackwell and Neushatz (1996) report, for example, that misinformation effects on laboratory generated events may last for up to approximately 48 hours before deteriorating. In contrast, researchers of autobiographical false memories indicate that they increase over a period of years (e.g. Loftus & Ketcham, 1991; Schmolck, Buffalo & Squire, 2000). This can, presumably, be affected by factors such as repeated retrieval of the information (Roediger, Jacoby, & McDermott, 1996) and the social situation in which the event is encoded and retrieved (Roediger, Meade, & Bergman, 2001). It would be interesting to investigate the effects of time on false memories for paranormal events and whether misinformation given before or during an event can have a long-

term effect. A follow-up of the Hampton Court and séance studies after a period of time would be a valuable source of information. These follow-ups could be manipulated so that some participants are asked about their memories a number of times over that period while others are only asked once. This would provide information about whether repeated questioning enhances or degrades false memories developed as a result of misinformation.

## **CONCLUSIONS**

The aims of this thesis were threefold. Firstly, to investigate whether misleading information is able to affect the perception of an event in addition to the recollection of it, by presenting the misinformation at different stages of the study. Secondly, to consider the possible link between false memory and paranormal belief. Finally, to examine whether believers and disbelievers differ in their susceptibility to suggestion presented at different stages.

The work concerning presentation of suggestion at different stages yielded some unusual results. Contrary to previous research, pre-event suggestion did not affect reports of an event. However, it is unclear whether the suggestion failed because the technique is not successful at affecting perception, or for different reasons involving the presentation and reception of the suggestion. The during-event suggestion had more success in the laboratory than in a real-life situation. There was mixed success in the séance studies, with negative suggestions being accepted more readily than positive suggestions, and the positive suggestion being accepted primarily by believers. However, there was a strong and consistent effect of suggestion on perception and memory of events in the key bending studies, and it is clear that during-event suggestion offers great potential as an area of future research.

With regard to the second aim, there was little success in establishing a link between global paranormal belief and false memory. However, it is noted that there is potential for future study involving different facets of false memory. There were mixed results for

the third aim of the thesis. There was some indication that believers may be more susceptible to suggestion than disbelievers in specific situations. A more reliable effect was that believers and disbelievers interpret situations differently, and believers will be more ready to make attributions of paranormality in ambiguous situations. It is therefore concluded that, while believers may be no more susceptible to misinformation and false memory than disbelievers, the two groups will experience situations in contrasting ways because they attend to situations differently and form differing interpretations with regard to the cause of events.

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# ***APPENDICES***

**APPENDIX A:  
PARANORMAL BELIEF SCALE  
(TOBACYK, & MILFORD, 1983)**

## BELIEF IN PARANORMAL QUESTIONNAIRE.

The questionnaire contains 25 statements relating to paranormal phenomena. Beside each statement there is a rating scale of 1-5. Please use the rating scale to rate your degree of agreement with each statement, where; 1= strongly disagree with the statement 3= undecided 5= strongly agree with the statement. Please complete a rating scale for each statement. The questionnaire is completely anonymous.

STATEMENT	RATING SCALE				
The soul continues to exist though the body may die.	1	2	3	4	5
Some individuals are able to levitate (lift) objects through mental forces.	1	2	3	4	5
Black magic really exists.	1	2	3	4	5
Black cats can bring bad luck.	1	2	3	4	5
Your mind or soul can leave your body and travel (astral projection)	1	2	3	4	5
The abominable snowman of Tibet exists.	1	2	3	4	5
Dreams can provide information about the future.	1	2	3	4	5
There is a devil.	1	2	3	4	5
Psychokinesis, the movement of objects through psychic powers, does occur.	1	2	3	4	5
Witches do exist.	1	2	3	4	5
If you break a mirror you will have bad luck.	1	2	3	4	5
During altered states, such as sleep or trances, the spirit can leave the body.	1	2	3	4	5
The Loch Ness monster of Scotland exists.	1	2	3	4	5
Some people have the ability to predict the future.	1	2	3	4	5
I believe in God.	1	2	3	4	5
A person's thoughts can influence the movement of a physical object.	1	2	3	4	5
Voodoo is a real method to use paranormal powers.	1	2	3	4	5
The number "13" is unlucky.	1	2	3	4	5
Reincarnation does occur.	1	2	3	4	5
Big Foot exists.	1	2	3	4	5
The idea of predicting the future is foolish.	1	2	3	4	5
There is a heaven and hell.	1	2	3	4	5
Mind reading is not possible.	1	2	3	4	5
There are actual cases of Voodoo death.	1	2	3	4	5
It is possible to communicate with the dead.	1	2	3	4	5

Thank-you.

**APPENDIX B:  
DISSOCIATIVE EXPERIENCES SCALE  
(CARLSON, & PUTNAM, 1993)**

Directions: This questionnaire consists of twenty-eight questions about experiences that you may have in your daily life. We are interested in how often you have these experiences. It is important, however, that your answers show how often these experiences happen to you when you are not under the influence of alcohol or drugs. To answer the questions, please determine to what degree the experience described in the question applies to you and circle the number to show what percentage of the time you have the experience.

Example:

0% 10 20 30 40 50 60 70 80 90 100%  
(never) (always)

Date \_\_\_\_\_ Age \_\_\_\_\_ Sex: M F

1. Some people have the experience of driving or riding in a car or bus or subway and suddenly realizing that they don't remember what has happened during all or part of the trip. Circle a number to show what percentage of the time this happens to you.  
0% 10 20 30 40 50 60 70 80 90 100%
2. Some people find that sometimes they are listening to someone talk and they suddenly realize that they did not hear part or all of what was said. Circle a number to show what percentage of the time this happens to you.  
0% 10 20 30 40 50 60 70 80 90 100%
3. Some people have the experience of finding themselves in a place and having no idea how they got there. Circle a number to show what percentage of the time this happens to you.  
0% 10 20 30 40 50 60 70 80 90 100%
4. Some people have the experience of finding themselves dressed in clothes that they don't remember putting on. Circle a number to show what percentage of the time this happens to you.  
0% 10 20 30 40 50 60 70 80 90 100%
5. Some people have the experience of finding new things among their belongings that they do not remember buying. Circle a number to show what percentage of the time this happens to you.  
0% 10 20 30 40 50 60 70 80 90 100%
6. Some people sometimes find that they are approached by people who they do not know who call them by another name or insist that they have met them before. Circle a number to show what percentage of the time this happens to you.  
0% 10 20 30 40 50 60 70 80 90 100%
7. Some people sometimes have the experience of feeling as though they are standing next to themselves or watching themselves do something and they actually see themselves as if they were looking at another person. Circle a number to show what percentage of the time this happens to you.  
0% 10 20 30 40 50 60 70 80 90 100%
8. Some people are told that they sometimes do not recognize friends or family members. Circle a number to show what percentage of the time this happens to you.  
0% 10 20 30 40 50 60 70 80 90 100%
9. Some people find that they have no memory for some important events in their lives (for example, a wedding or graduation). Circle a number to show what percentage of the time this happens to you.  
0% 10 20 30 40 50 60 70 80 90 100%
10. Some people have the experience of being accused of lying when they do not think that they have lied. Circle a number to show what percentage of the time this happens to you.  
0% 10 20 30 40 50 60 70 80 90 100%
11. Some people have the experience of looking in a mirror and not recognizing themselves. Circle a number to show what percentage of the time this happens to you.  
0% 10 20 30 40 50 60 70 80 90 100%
12. Some people have the experience of feeling that other people, objects, and the world around them are not real. Circle a number to show what percentage of the time this happens to you.  
0% 10 20 30 40 50 60 70 80 90 100%
13. Some people have the experience of feeling that their body does not seem to belong to them. Circle a number to show what percentage of the time this happens to you.  
0% 10 20 30 40 50 60 70 80 90 100%



14. Some people have the experience of sometimes remembering a past event so vividly that they feel as if they were reliving that event. Circle a number to show what percentage of the time this happens to you.
- 0%    10    20    30    40    50    60    70    80    90    100%
15. Some people have the experience of not being sure whether things that they remember happening really did happen or whether they just dreamed them. Circle a number to show what percentage of the time this happens to you.
- 0%    10    20    30    40    50    60    70    80    90    100%
16. Some people have the experience of being in a familiar place but finding it strange and unfamiliar. Circle a number to show what percentage of the time this happens to you.
- 0%    10    20    30    40    50    60    70    80    90    100%
17. Some people find that when they are watching television or a movie they become so absorbed in the story that they are unaware of other events happening around them. Circle a number to show what percentage of the time this happens to you.
- 0%    10    20    30    40    50    60    70    80    90    100%
18. Some people find that they become so involved in a fantasy or daydream that it feels as though it were really happening to them. Circle a number to show what percentage of the time this happens to you.
- 0%    10    20    30    40    50    60    70    80    90    100%
19. Some people find that they sometimes are able to ignore pain. Circle a number to show what percentage of the time this happens to you.
- 0%    10    20    30    40    50    60    70    80    90    100%
20. Some people find that they sometimes sit staring off into space, thinking of nothing, and are not aware of the passage of time. Circle a number to show what percentage of the time this happens to you.
- 0%    10    20    30    40    50    60    70    80    90    100%
21. Some people sometimes find that when they are alone they talk out loud to themselves. Circle a number to show what percentage of the time this happens to you.
- 0%    10    20    30    40    50    60    70    80    90    100%
22. Some people find that in one situation they may act so differently compared with another situation that they feel almost as if they were two different people. Circle a number to show what percentage of the time this happens to you.
- 0%    10    20    30    40    50    60    70    80    90    100%
23. Some people sometimes find that in certain situations they are able to do things with amazing ease and spontaneity that would usually be difficult for them (for example, sports, work, social situations, etc.). Circle a number to show what percentage of the time this happens to you.
- 0%    10    20    30    40    50    60    70    80    90    100%
24. Some people sometimes find that they cannot remember whether they have done something or have just thought about doing that thing (for example, not knowing whether they have mailed a letter or have just thought about mailing it). Circle a number to show what percentage of the time this happens to you.
- 0%    10    20    30    40    50    60    70    80    90    100%
25. Some people find evidence that they have done things that they do not remember doing. Circle a number to show what percentage of the time this happens to you.
- 0%    10    20    30    40    50    60    70    80    90    100%
26. Some people sometimes find writings, drawings, or notes among their belongings that they must have done but cannot remember doing. Circle a number to show what percentage of the time this happens to you.
- 0%    10    20    30    40    50    60    70    80    90    100%
27. Some people sometimes find that they hear voices inside their head that tell them to do things or comment on things that they are doing. Circle a number to show what percentage of the time this happens to you.
- 0%    10    20    30    40    50    60    70    80    90    100%
28. Some people sometimes feel as if they are looking at the world through a fog so that people and objects appear far away or unclear. Circle a number to show what percentage of the time this happens to you.
- 0%    10    20    30    40    50    60    70    80    90    100%

**APPENDIX C:  
VIVIDNESS OF VISUAL  
IMAGERY QUESTIONNAIRE  
(MARKS, 1973)**

Participant number: \_\_\_\_\_

*You will shortly be asked to imagine each of the items listed below. Please work through them in order, spending a short while on each item. After you have imagined each item, please use the lines on the right hand side of the page to rate the image produced, using the following rating scale:*

<i>Perfectly clear and as vivid as normal vision</i>	<u>1</u> .
<i>Clear and reasonably vivid</i>	<u>2</u> .
<i>Moderately clear and vivid</i>	<u>3</u> .
<i>Vague and dim</i>	<u>4</u> .
<i>No image at all, you only 'know' you are thinking of the object</i>	<u>5</u> .

**Think of some relative or friend whom you frequently see (but who is not with you at present) and consider carefully the picture that comes before your mind's eye.**

1. The exact contour of face, head, shoulders and body \_\_\_\_\_
2. Characteristic poses of head, attitudes of body, etc. \_\_\_\_\_
3. The precise carriage, length of step, etc., in walking \_\_\_\_\_
4. The different colours worn in some familiar clothes \_\_\_\_\_

**Visualise a rising sun. Consider carefully the picture that comes before your mind's eye.**

5. The sun is rising above the horizon into a hazy sky \_\_\_\_\_
6. The sky clears and surrounds the sun with blueness \_\_\_\_\_
7. Clouds. A storm blows up, with flashes of lightning \_\_\_\_\_
8. A rainbow appears \_\_\_\_\_

**Think of the front of a shop which you often go to. Consider the picture that comes before your mind's eye.**

9. The overall appearance of the shop from the opposite side of the road \_\_\_\_\_
10. A window display including colours, shapes and details of individual items for sale \_\_\_\_\_
11. You are near the entrance. The colour, shape and details of the door \_\_\_\_\_
12. You enter the shop and go to the counter. The counter assistant serves you. Money changes hands \_\_\_\_\_

**Finally, think of a country scene which involves trees, mountains and a lake. Consider the picture that comes before your mind's eye.**

13. The contours of the landscape \_\_\_\_\_
14. The colour and shape of the trees \_\_\_\_\_
15. The colour and shape of the lake \_\_\_\_\_
16. A strong wind blows on the trees and on the lake causing waves \_\_\_\_\_

**APPENDIX D:  
SLIDESHOW RESPONSE QUESTIONNAIRE**

You were shown a series of slides depicting animals. Some of the slides featured photographs of the animals, but for others you were asked to imagine the animal named. For each item on the following list, please tick a box to indicate whether you saw the PHOTOGRAPH or IMAGINED the animal. Additionally, please rate your confidence for each answer by circling a number on the 1-7 scale provided, using the following guidelines:

1                      2                      3                      4                      5                      6                      7  
 Not at all                      Uncertain                      Very  
 confident

		PHOTOGRAPH	IMAGINED	CONFIDENCE						
1	LION			1	2	3	4	5	6	7
2	WOLF			1	2	3	4	5	6	7
3	WHALES			1	2	3	4	5	6	7
4	HORSE			1	2	3	4	5	6	7
5	DEER			1	2	3	4	5	6	7
6	DUCKS			1	2	3	4	5	6	7
7	ELEPHANT			1	2	3	4	5	6	7
8	SEALS			1	2	3	4	5	6	7
9	PIGS			1	2	3	4	5	6	7
10	FROG			1	2	3	4	5	6	7
11	ELK			1	2	3	4	5	6	7
12	SHEEP			1	2	3	4	5	6	7
13	DONKEYS			1	2	3	4	5	6	7
14	OWLS			1	2	3	4	5	6	7
15	MOUSE			1	2	3	4	5	6	7
16	FLAMINGOES			1	2	3	4	5	6	7
17	TIGER			1	2	3	4	5	6	7
18	BUFFALO			1	2	3	4	5	6	7
19	FISH			1	2	3	4	5	6	7
20	RABBIT			1	2	3	4	5	6	7
21	GIRAFFE			1	2	3	4	5	6	7
22	TORTOISE			1	2	3	4	5	6	7
23	BEAR			1	2	3	4	5	6	7
24	COWS			1	2	3	4	5	6	7

**APPENDIX E:  
REVISED TRANSLIMINALITY SCALE  
(LANGE et al., 2000)**

Participant number: \_\_\_\_\_

Please circle "True" or "False" after each of the statements below.

1.	At times I perform certain little rituals to ward off negative influences.	TRUE	FALSE
2.	I have experienced an altered state of consciousness in which I felt that I became cosmically enlightened.	TRUE	FALSE
3.	At the present time, I am very good at make-believe and imagining.	TRUE	FALSE
4.	I have felt that I had received special wisdom, to be communicated to the rest of humanity.	TRUE	FALSE
5.	I have sometimes sensed an evil presence around me, although I could not see it.	TRUE	FALSE
6.	My thoughts have sometimes come so quickly that I couldn't write them all down fast enough.	TRUE	FALSE
7.	It is sometimes possible for me to be completely immersed in nature or in art and to feel as if my whole state of consciousness has somehow temporarily been altered.	TRUE	FALSE
8.	Often I have a day when indoor lights seem so bright that they bother my eyes.	TRUE	FALSE
9.	I have experienced an altered state of consciousness which I believe utterly transformed (in a positive manner) the way I looked at myself.	TRUE	FALSE
10.	I think that I really know what some people mean when they talk about mystical experiences.	TRUE	FALSE
11.	I have gone through times when smells seemed stronger and more overwhelming than usual.	TRUE	FALSE
12.	I can clearly feel again in my imagination such things as the feeling of a gentle breeze, warm sand under my bare feet, the softness of fur, cool grass, the warmth of the sun, and the smell of freshly cut grass.	TRUE	FALSE
13.	A person should try to understand their dreams and be guided by or take warnings from them.	TRUE	FALSE
14.	At times I somehow feel the presence of someone who is not physically there.	TRUE	FALSE
15.	For several days at a time I have had such a heightened awareness of sights and sounds that I cannot shut them out.	TRUE	FALSE
16.	I sometimes have a feeling of gaining or losing energy when certain people look at me or touch me.	TRUE	FALSE
17.	When listening to organ music or other powerful music, I sometimes feel as if I am being lifted up into the air.	TRUE	FALSE

**APPENDIX F:  
HAUNTED GALLERY PRIOR EXPERIENCES  
AND BELIEF QUESTIONNAIRE**



THE HAMPTON COURT PROJECT

Sex: \_\_\_\_\_ Male \_\_\_\_\_ Female \_\_\_\_\_ Age: \_\_\_\_\_

Please answer the following questions as honestly as possible. There are no right or wrong answers - it's your opinion that matters. All of your answers will be kept confidential.

1) Do you believe that ghosts exist?  
 \_\_\_\_\_ Definitely Yes \_\_\_\_\_ Probably Yes \_\_\_\_\_ Uncertain \_\_\_\_\_ Probably No \_\_\_\_\_ Definitely No

2a) For each of the following, please tick a line to indicate how often, *while awake*, you experience an unusual.....

....change in temperature	_____ Never	_____ Very infrequently	_____ Infrequently	_____ Frequently	_____ Very frequently
....sense of presence	_____ Never	_____ Very infrequently	_____ Infrequently	_____ Frequently	_____ Very frequently
....sound or noise	_____ Never	_____ Very infrequently	_____ Infrequently	_____ Frequently	_____ Very frequently
....sight	_____ Never	_____ Very infrequently	_____ Infrequently	_____ Frequently	_____ Very frequently
....taste	_____ Never	_____ Very infrequently	_____ Infrequently	_____ Frequently	_____ Very frequently
....smell	_____ Never	_____ Very infrequently	_____ Infrequently	_____ Frequently	_____ Very frequently
....sense of dizziness	_____ Never	_____ Very infrequently	_____ Infrequently	_____ Frequently	_____ Very frequently
....emotional feeling	_____ Never	_____ Very infrequently	_____ Infrequently	_____ Frequently	_____ Very frequently

If you have never experienced any of these phenomena, even very infrequently, please answer Questions 2b, 3 and 4.  
 If you have never experienced any of these phenomena, please only answer Questions 3 and 4.

2b) Do you think that any of these experiences were due to a ghost?  
 \_\_\_\_\_ Definitely Yes \_\_\_\_\_ Probably Yes \_\_\_\_\_ Uncertain \_\_\_\_\_ Probably No \_\_\_\_\_ Definitely No

3) Many people have reported having these experiences whilst in The Haunted Gallery of Hampton Court Palace. Have you heard (e.g., from acquaintances, television programmes or newspaper articles), where in The Haunted Gallery these experiences have been reported?  
 \_\_\_\_\_ Definitely Yes \_\_\_\_\_ Probably Yes \_\_\_\_\_ Uncertain \_\_\_\_\_ Probably No \_\_\_\_\_ Definitely No

4) Do you expect to experience any of these phenomena in The Haunted Gallery today?  
 \_\_\_\_\_ Definitely Yes \_\_\_\_\_ Probably Yes \_\_\_\_\_ Uncertain \_\_\_\_\_ Probably No \_\_\_\_\_ Definitely No

Many thanks. Please do not turn over the page until instructed to do so.

**APPENDIX G:  
GEORGIAN ROOMS PRIOR EXPERIENCES  
AND BELIEF QUESTIONNAIRE**

THE HAMPTON COURT PROJECT

Sex:  Male  Female Age:

Please answer the following questions as honestly as possible. There are no right or wrong answers - it's your opinion that matters. All of your answers will be kept confidential.

1) Do you believe that ghosts exist?  
 Definitely Yes  Probably Yes  Uncertain  Probably No  Definitely No

2a) For each of the following, please tick a line to indicate how often, *while awake*, you experience an unusual.....

....change in temperature	<input type="checkbox"/> Never	<input type="checkbox"/> Very infrequently	<input type="checkbox"/> Infrequently	<input type="checkbox"/> Frequently	<input type="checkbox"/> Very frequently
....sense of presence	<input type="checkbox"/> Never	<input type="checkbox"/> Very infrequently	<input type="checkbox"/> Infrequently	<input type="checkbox"/> Frequently	<input type="checkbox"/> Very frequently
....sound or noise	<input type="checkbox"/> Never	<input type="checkbox"/> Very infrequently	<input type="checkbox"/> Infrequently	<input type="checkbox"/> Frequently	<input type="checkbox"/> Very frequently
....sight	<input type="checkbox"/> Never	<input type="checkbox"/> Very infrequently	<input type="checkbox"/> Infrequently	<input type="checkbox"/> Frequently	<input type="checkbox"/> Very frequently
....taste	<input type="checkbox"/> Never	<input type="checkbox"/> Very infrequently	<input type="checkbox"/> Infrequently	<input type="checkbox"/> Frequently	<input type="checkbox"/> Very frequently
....smell	<input type="checkbox"/> Never	<input type="checkbox"/> Very infrequently	<input type="checkbox"/> Infrequently	<input type="checkbox"/> Frequently	<input type="checkbox"/> Very frequently
....sense of dizziness	<input type="checkbox"/> Never	<input type="checkbox"/> Very infrequently	<input type="checkbox"/> Infrequently	<input type="checkbox"/> Frequently	<input type="checkbox"/> Very frequently
....emotional feeling	<input type="checkbox"/> Never	<input type="checkbox"/> Very infrequently	<input type="checkbox"/> Infrequently	<input type="checkbox"/> Frequently	<input type="checkbox"/> Very frequently

If you have experienced any of these phenomena, even very infrequently, please answer Questions 2b, 3 and 4.  
 If you have never experienced any of these phenomena, please only answer Questions 3 and 4.

2b) Do you think that any of these experiences were due to a ghost?  
 Definitely Yes  Probably Yes  Uncertain  Probably No  Definitely No

3) Many people have reported having these experiences whilst in The Georgian Rooms of Hampton Court Palace. Have you heard (e.g., from acquaintances, television programmes or newspaper articles), where in The Georgian Rooms these experiences have been reported?  
 Definitely Yes  Probably Yes  Uncertain  Probably No  Definitely No

4) Do you expect to experience any of these phenomena in The Georgian Rooms today?  
 Definitely Yes  Probably Yes  Uncertain  Probably No  Definitely No

Many thanks. Please do not turn over the page until instructed to do so.

**APPENDIX H:  
HAUNTED GALLERY LOCATION MAP**

Please spend some time quietly walking around The Haunted Gallery and then place a cross on the floor plan to indicate where you think that people have reported their experiences.

Please tick one or more of the following to indicate the experience(s) that you think they have reported:

- A sense of presence
- A sound or noise
- A change in temperature
- A smell
- A sense of sight
- A taste
- A sense of dizziness
- An emotional feeling

Other (please specify): \_\_\_\_\_

Please briefly explain why you chose this location: \_\_\_\_\_

Did you experience anything at this location?

Yes \_\_\_\_\_ No \_\_\_\_\_

If yes....

.....please write a brief description of your experience: \_\_\_\_\_

.....do you think that your experience was due to a ghost?

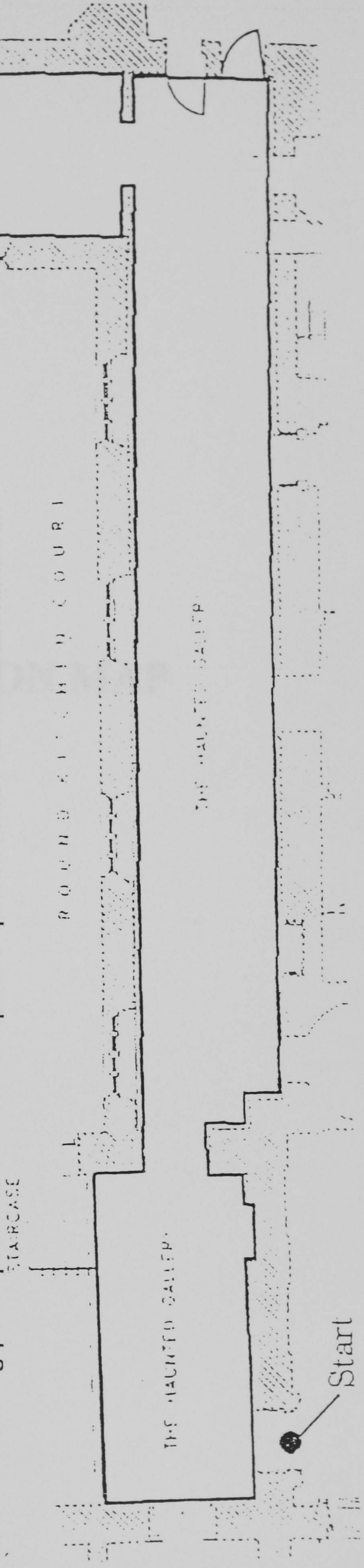
Definitely Yes \_\_\_\_\_ Probably Yes \_\_\_\_\_ Uncertain \_\_\_\_\_ Probably No \_\_\_\_\_ Definitely No \_\_\_\_\_

If you are interested in completing a more detailed questionnaire that would be helpful to the project, please provide your name and address below. All of this information will remain completely confidential.

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Many thanks for taking part - please hand the completed questionnaire to our team member.



**APPENDIX I:  
GEORGIAN ROOMS LOCATION MAP**

Please spend some time quietly walking around the The Georgian Rooms. If you DO experience anything then please complete SECTIONS 1& 2. If you DO NOT experience anything then please just complete SECTION 2. Please remember to report all experiences, no matter how faint they may be.

SECTION 1

- 1) Please place a cross on the floor plan to indicate where your experience occurred.
- 2) Please tick one or more of the following to indicate the nature of your experience and rate the intensity of your experience by writing a number between 1 (not at all intense) to 7 (very intense):

Experience	Intensity (1 to 7)	Experience	Intensity (1 to 7)
<input type="checkbox"/> A sense of presence	_____	<input type="checkbox"/> A sight	_____
<input type="checkbox"/> A sound or noise	_____	<input type="checkbox"/> A taste	_____
<input type="checkbox"/> A change in temperature	_____	<input type="checkbox"/> A sense of dizziness	_____
<input type="checkbox"/> A smell	_____	<input type="checkbox"/> An emotional feeling	_____
<input type="checkbox"/> Other	_____		

3) Please write a brief description of your experience: \_\_\_\_\_

4) Do you think that your experience was due to a ghost?

- Definitely Yes
- Probably Yes
- Uncertain
- Probably No
- Definitely No

If you wish to report your experiences in another location, please use the additional floor plans provided.

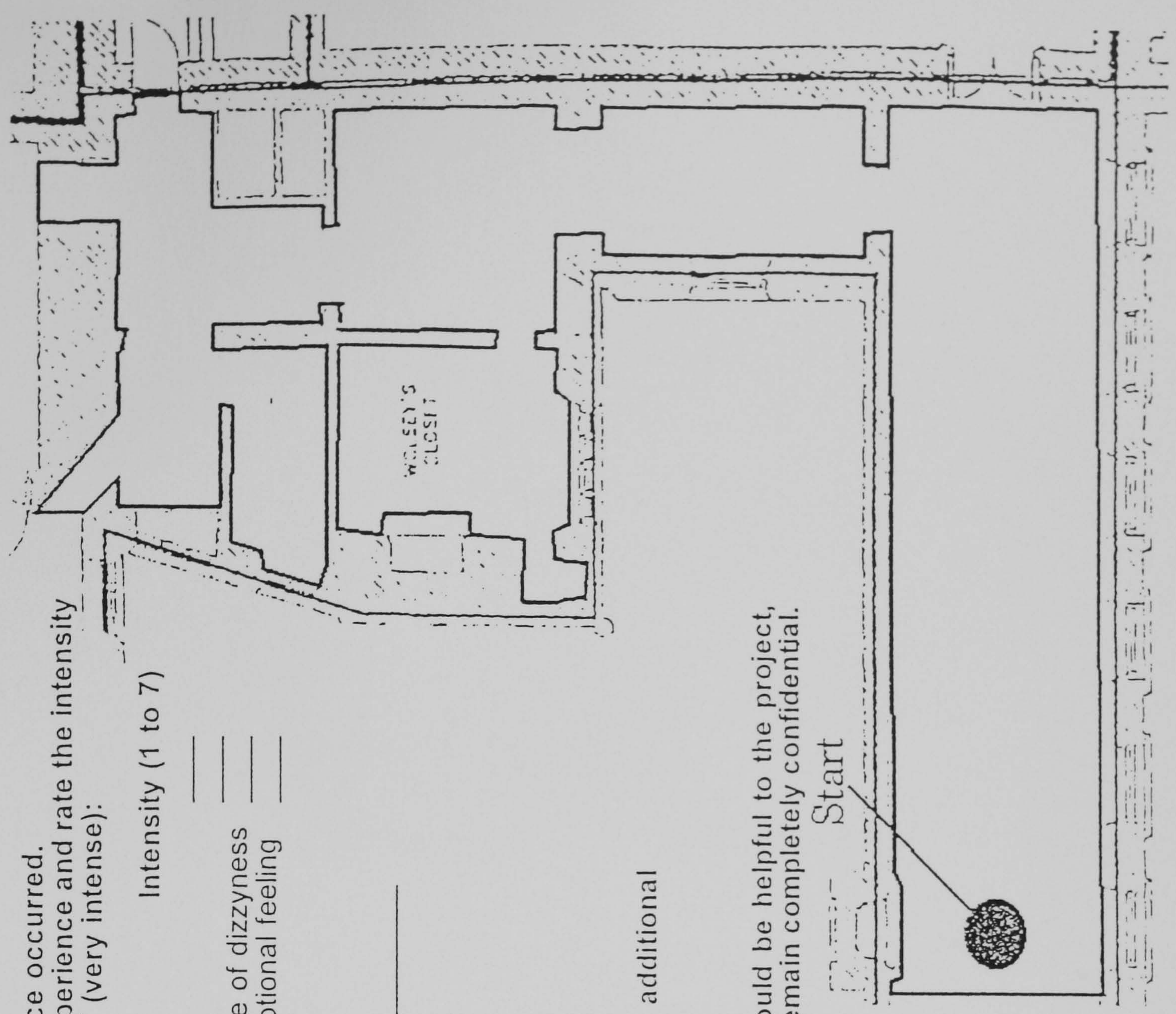
SECTION 2

If you are interested in completing a more detailed questionnaire that would be helpful to the project, please provide your name and address below. All of this information will remain completely confidential.

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Many thanks for taking part - please hand the completed questionnaire to our team member.







**APPENDIX J:**  
**SÉANCE INITIAL QUESTIONNAIRE**

## WELCOME TO 'SÉANCE'

We would like to conduct a small survey into the phenomena that you experience during the séance. In order to send you a short questionnaire in a couple of weeks time we would appreciate it if you could complete this form.

Please answer honestly – all of the information you provide will remain completely confidential. The term 'paranormal' refers to phenomena which you believe to be beyond normal explanation.

**Do you believe that paranormal phenomena sometimes occur during séances?**

Definitely Yes			Uncertain			Definitely No
1	2	3	4	5	6	7

### Your details

Name \_\_\_\_\_

Address \_\_\_\_\_

Postcode \_\_\_\_\_

**APPENDIX K:  
SÉANCE FOLLOW-UP QUESTIONNAIRE**

## QUESTIONNAIRE

Many thanks for taking part in our 'seance' experiment. As promised, here is a brief questionnaire which asks for your thoughts about the events which took place.

Once you have completed the questionnaire please return it to us in the pre-paid envelope enclosed (no stamp required) and we will send you a complete report of our findings in a few weeks time.

- Please answer the following questions as honestly as possible.
- Please complete the questionnaire in the order in which it is written.
- The term 'paranormal' refers to phenomena which you believe to be beyond any normal explanation.
- Please do not ask other people who were also at the seance about their answers - we are interested in what YOU think.
- All of your answers will be kept strictly confidential.

Again, many thanks for taking part.

Best Wishes

Dr Richard Wiseman

### SECTION 1

*Please tick 'Yes', 'Uncertain' or 'No' to indicate whether you believe the following statements are correct.*

**During the seance.....**

**.....the bell moved.**

\_\_\_\_\_ Yes      \_\_\_\_\_ Uncertain      \_\_\_\_\_ No

**If you have ticked 'yes' or 'uncertain', please describe what you remember seeing:**

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.....the maraca moved.

\_\_\_\_\_ Yes      \_\_\_\_\_ Uncertain      \_\_\_\_\_ No

**If you have ticked 'yes' or 'uncertain', please describe what you remember seeing:**

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.....the slate moved.

\_\_\_\_\_ Yes      \_\_\_\_\_ Uncertain      \_\_\_\_\_ No

**If you have ticked 'yes' or 'uncertain', please describe what you remember seeing:**

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.....the ball moved.

\_\_\_\_\_ Yes      \_\_\_\_\_ Uncertain      \_\_\_\_\_ No

**If you have ticked 'yes' or 'uncertain', please describe what you remember seeing:**

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....the tambourine moved.

\_\_\_\_\_ Yes      \_\_\_\_\_ Uncertain      \_\_\_\_\_ No

**If you have ticked 'yes' or 'uncertain', please describe what you remember seeing:**

---

---

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....the candlestick moved.

\_\_\_\_\_ Yes      \_\_\_\_\_ Uncertain      \_\_\_\_\_ No

**If you have ticked 'yes' or 'uncertain', please describe what you remember seeing:**

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## **SECTION 2**

**1) Did you experience any phenomena not mentioned above?**

\_\_\_\_\_ Yes      \_\_\_\_\_ Uncertain      \_\_\_\_\_ No

**If you have ticked 'yes' or 'uncertain', please briefly describe the phenomena below:**

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**2) Do you think that any of the phenomena that you experienced during the seance were paranormal?**

\_\_\_\_\_ Yes    \_\_\_\_\_ Uncertain    \_\_\_\_\_ No

**If you have ticked 'yes' or 'uncertain', please list the phenomena which you believe might have been paranormal:**

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**3) Have you attended a seance at the Fortean Times Unconvention before?**

\_\_\_\_\_ Yes    \_\_\_\_\_ No

**Any other comments?**

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**Please return the questionnaire us in the pre-paid envelope enclosed (no stamp required) and we will send you a complete report of our findings in a few weeks time.**

**Many thanks.**

**APPENDIX L:  
TRANSCRIPT OF SUGGESTION VIDEO**



**Camera shot is of a table with two men seated behind it, and various items on the table in front of the interviewer.**

**Interviewer: OK, well, thanks for coming along this afternoon. We're filming this**  
*moves ESP cards*  
**from two cameras. The first is a wide shot of the whole table and the second a**  
*gestures to indicate table*  
**close up of this area here. There's few bits and pieces here, some spoons, forks,**  
*rubs table in front of performer* *points to items*  
**keys, ESP cards. It's really up to you, whatever you're most comfortable with.**  
**Over to you.**

**Performer: OK, um, we'll begin with a key.**

*looks at items selects key from pile, slides it to middle of table.*

*Camera cuts to close up*

**What I'm going to try to do is to pass energy to the key through the fingers... the**  
*takes the end of key in right hand and picks it up*

**fingers of my left hand, by passing through psychic energy and causing the metal**  
*covers whole of key with left hand, then the right end of the key is held in the right hand*  
*while the left hand rubs the middle of the key.....continues rubbing.....*

**of the key to bend. Now at the moment, it's getting a little warmer and there's a**  
*moves left hand so slightly more of the key shows. Left hand is making larger rubbing*  
*moves*

**slight bend. I don't know if you can see that on the camera yet. If I... I'll turn the**  
**key round a little bit and hopefully allow you to see. There's a bend emerging at**  
*turns key toward camera to show bend.....continues rubbing.....*

**the end of the key. It's bending a little bit more now, and it's a little bit hotter. It's**  
**starting to cool - I think that's probably as far as it's going to go this time. If I put**  
**that down on the table**

*uses left hand to place right end of key on table - key tips over onto left end.*

**you'll be able to see that's something like a 25° angle.**

*Performer moves the key so the bend is clearly visible.*

**APPENDIX M:  
BELIEF IN THE PARANORMAL  
QUESTIONNAIRE  
(WISEMAN AND MORRIS, 1995)**

**1. Do you think that some people are able to gain, by paranormal means, access to information being thought of by others?**

1	2	3	4	5	6	7
Definitely No			Uncertain			Definitely Yes

**2. Do you think that some people are able to gain, by paranormal means, access to information that nobody else is aware of at the time (e.g. the order of a shuffled deck of cards)?**

1	2	3	4	5	6	7
Definitely No			Uncertain			Definitely Yes

**3. Do you think that some people can, by paranormal means, know what is going to happen in the future?**

1	2	3	4	5	6	7
Definitely No			Uncertain			Definitely Yes

**4. Do you think that some people can influence a frequently occurring event (e.g. a number of rolls of dice) such that the outcome of that event deviates away from chance (e.g. the dice show more or less 'sixes' than would be predicted by chance alone)?**

1	2	3	4	5	6	7
Definitely No			Uncertain			Definitely Yes

**5. Do you think that some people can, just by mental effort, apply a noticeable force to an object?**

Definitely  
No

Uncertain

Definitely  
Yes

**6. Do you think that some people can, just by mental effort, alter the physical characteristics of the material from which an object is made?**

1

2

3

4

5

6

7

Definitely  
No

Uncertain

Definitely  
Yes

**7. Do you believe that you have experienced any of the following (please tick as appropriate):**

a) Telepathy\_\_\_\_\_

b) Psychokinesis\_\_\_\_\_

c) Precognition\_\_\_\_\_

d) Out of Body Experiences\_\_\_\_\_

e) Sighting of an Apparition\_\_\_\_\_

f) UFO Sightings\_\_\_\_\_

g) Lucid Dreams\_\_\_\_\_

**APPENDIX N:  
KEY RESPONSE QUESTIONNAIRE**

Participant number \_\_\_\_\_

**Please rate your level of agreement/disagreement and confidence with each of the following questions by circling a number on the seven point scales below.**

**1) At the beginning of the film the interviewer touched the objects on the table:**

1	2	3	4	5	6	7
Definitely No			Uncertain			Definitely Yes

**How confident are you of your answer to this question?**

1	2	3	4	5	6	7
Not at all Confident						Very Confident

**2) The performer said that the key was heating up as he bent it:**

1	2	3	4	5	6	7
Definitely No			Uncertain			Definitely Yes

**How confident are you of your answer to this question?**

1	2	3	4	5	6	7
Not at all Confident						Very Confident

**Please turn over...**

**3) After the key was placed on the table it continued to bend:**

1	2	3	4	5	6	7
Definitely No			Uncertain			Definitely Yes

**How confident are you of your answer to this question?**

1	2	3	4	5	6	7
Not at all Confident						Very Confident

**4) Do you think that the bending of the key was paranormal?**

1	2	3	4	5	6	7
Definitely No			Uncertain			Definitely Yes

**How confident are you of your answer to this question?**

1	2	3	4	5	6	7
Not at all Confident						Very Confident

**5) Briefly outline your explanation for the bending of the key.**

**APPENDIX O:  
ALTERED RESPONSE QUESTIONNAIRE**



Participant number \_\_\_\_\_

***Please rate your level of agreement/disagreement and confidence with each of the following questions by circling a number on the seven point scales below.***

**1) At the beginning of the film the interviewer touched the objects on the table:**

1	2	3	4	5	6	7
Definitely No			Uncertain			Definitely Yes

**How confident are you of your answer to this question?**

1	2	3	4	5	6	7
Not at all Confident						Very Confident

**2) The performer said that the key was heating up as he bent it:**

1	2	3	4	5	6	7
Definitely No			Uncertain			Definitely Yes

**How confident are you of your answer to this question?**

1	2	3	4	5	6	7
Not at all Confident						Very Confident

**Please turn over...**

**3) After the key was placed on the table I saw it continue to bend:**

1	2	3	4	5	6	7
Definitely No			Uncertain			Definitely Yes

**How confident are you of your answer to this question?**

1	2	3	4	5	6	7
Not at all Confident						Very Confident

**4) Do you think that the bending of the key was paranormal?**

1	2	3	4	5	6	7
Definitely No			Uncertain			Definitely Yes

**How confident are you of your answer to this question?**

1	2	3	4	5	6	7
Not at all Confident						Very Confident

**5) Briefly outline your explanation for the bending of the key.**