VOLUME ONE

DISSOCIATION AND LATER INTRUSIVE MEMORIES

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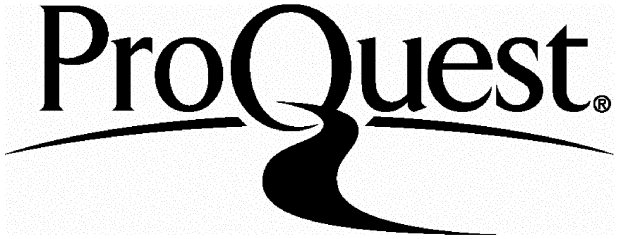

ABSTRACT

This study examines the relationship between peri-traumatic dissociation (dissociation at the time of a trauma) and later intrusive memories in two non-clinical groups.

Peri-traumatic dissociation is a known predictor of later pathological reactions (Van der Kolk & Van der Hart 1989), and poorer outcome (Shalev, Peri, Canetti & Schrieber, 1996) in clients with Post-traumatic stress disorder (PTSD). One of the reasons for this could be that peri-traumatic dissociation has been shown to increase later intrusive memories of stressful events (Brewin & Saunders 2001; Holmes, 2000). In order to study this, an analogue trauma was created using stressful films of the aftermath of road traffic accidents. Non-clinical participants were then exposed to the films under controlled laboratory conditions. Participants completed before and after measures of state and trait dissociation and rated how they felt during the films before recording their intrusive memories of the films in a diary over the following week. Two experimental studies were conducted using different participants.

The first study attempted to decrease dissociation using a grounding technique (manipulating plasticine). The second attempted to increase dissociation using a hypnotic induction. The manipulation of dissociation in the laboratory is extremely difficult. Both studies conducted were within-subjects designs, and all participants received the dissociation manipulation whilst viewing a stressful film and a control no-task condition in which they viewed a stressful film only.

Previous studies have given participants guidelines on how to dissociate (Murray, 1997) and practice in the technique (Holmes, 2000) but they were unsuccessful in increasing state dissociation. Holmes and Brewin (2001) suggested a more powerful technique should be used such as a pharmacological agent or hypnosis.

Contrary to predictions, participants did not experience significantly more intrusions from the film in which they received hypnotic suggestions to dissociate than from the control condition

film. However, they did report an increased level of dissociation, indicating that hypnosis is a useful technique for increasing self-reported dissociation.

As predicted, fewer intrusive memories were reported from the film in which participants performed a grounding task than from the control film, however, participants did not report decreased levels of dissociation. The theoretical implications of these studies are discussed, including the way in which dissociation should be measured, and the support found for Brewin, Dalgliesh, and Joseph's, (1996) Dual Representation Theory of post-traumatic stress disorder. Suggestions for incorporating these findings into clinical settings are made, and future research topics are highlighted.

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The Dissociation Working Party

INTRODUCTION

Overview of introduction.

Dissociative processes have been recorded for many years and yet (Michaelson & Ray, 1996), dissociation is a term which has been plagued by obscurity and misunderstanding. Before reading this thesis I would like the reader to pause for a brief moment and reflect upon what they understand the term dissociation to mean, as it is vital we have a clear understanding of our own assumptions as we begin to examine this topic.

At the beginning of my investigation, as a clinician working within a cognitive framework, I did not have a sophisticated understanding of the construct of dissociation. I had been unable to think further about the concept, and if asked to define it I would have had to conclude I wasn't completely sure. However, I knew that I could recognise dissociation as I had observed it in the therapy room when clients 'spaced out'. Accordingly, the following introduction seeks to explore some of the differing ways of conceptualising dissociation, and highlights why it is important to study this phenomenon in more depth. It then discusses the importance of peri-traumatic dissociation (dissociation at the time of trauma) in Post-traumatic Stress Disorder (PTSD), and explains the distressing symptom of intrusive memories through recourse to the dual-representation theory of PTSD. It continues by reviewing previous experimental studies of peri-traumatic dissociation, and describing why I have chosen to examine it in this way. Lastly, it considers the theories of emotional numbing in PTSD, which have also been linked to dissociation.

During the course of my investigation, I carried out two experimental studies. Much of the existing literature in this area is pertinent to both studies and is introduced in

this chapter. Any literature relevant to study one only is introduced in chapter two, and literature relevant only to study two is introduced in chapter three.

Why study dissociative processes?

Clinically, there are a number of client populations which report elements of dissociative experience. These include clients with a diagnosis of: Acute Stress Disorder (ASD), Post-traumatic Stress Disorder (PTSD), Panic Disorder, Schizophrenia, Borderline Personality Disorder (BPD), Bulimia and the gamut of dissociative disorders such as Dissociative Identity Disorder (DID) (Steinberg 1995). In addition, individuals with mood disorders report a high number of dissociative symptoms including transient affective, cognitive and sensory phenomena (Silberman et al., 1995).

Clinicians who would like to understand more about what dissociation is in order to best help their clients may turn to DSM IV (Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, American Psychiatric Association, 1994. p.427) where dissociation is defined as 'a disruption in the usually integrated functions of consciousness, memory, identity or perception of the environment.'

This is indeed a better description than my original statement of 'spacing out' but it appears to widen the possible experiences that a client may have, as we can immediately imagine a great number of dissociative processes, ranging from daydreaming to out-of-body experiences. It thus seems that a substantial variety of mental phenomena may fall under this heading, with the only common mechanism being a lack of integration. This has resulted in disparate phenomena being labelled dissociative, and confusion within and across disciplines, as I have found out during my own clinical practice through working in multi-disciplinary teams.

For example, while working in a substance misuse team I was present when a clinical nurse specialist was describing a client diagnosed with borderline personality disorder. She remarked that he was 'heavily dissociative'. The consultant psychiatrist enquired as to whether the nurse thought this was due to his heavy heroin use and when she replied in the negative, he became very concerned and suggested a neurological scan. The nurse then became confused and both she and the psychiatrist talked at cross-purposes for some time.

It appears remarkable that dissociation is so open to interpretation, when it is a term commonly used to describe experiences of so many clients who attend Mental Health Services and is relevant to anyone working clinically with persons with Mental Health Problems. This confusion may lead to clients' symptoms of dissociation being overlooked in routine practice. In 1993, Saxe et al. discovered that 15% of clients in a psychiatric hospital met the DSM-III criteria for a dissociative disorder, and also had higher rates of PTSD, BPD, and substance misuse problems. The dissociative disorder had not been recognised by clinicians at admission or discharge in 79% of clients, and in addition only 21% of clients who met diagnostic criteria for PTSD had been identified. It seems dissociative symptoms are often overlooked because of clients, multiform presentation (Saxe, Van der Kolk, Berkowitz, Chinman, Hall, Lieberg, Schwartz, 1993).

Indeed, it is only recently that this topic has been receiving the research attention it deserves (Gershuny & Thayer, 1999). In order to understand how this situation has come about, it is vital for us to consider the historical roots of the term.

Historical roots of the term 'dissociation'

Janet (1925, 1976) first used the term désagregation (dissociation) to suggest that the conscious mind could become separated from parts of itself. His theory was dependent on there being levels and compartments within consciousness. Janet was primarily interested in what is now known as DID, hypnosis, hysteria (a term which was finally dropped by DSM in the third edition) and hysterical fugue. In order to encompass all the phenomena experienced by these people, dissociation came to denote, for Janet, the splitting off of a set of mental experiences from consciousness, and a fragmentation of the self. This splitting off was thought to occur passively, possibly because of a weakness in some people's nervous system. In hysterics, this occurred because of some external traumatic event such as rape.

However, Janet's seminal writings on the topic came to be disregarded as Freud shifted attention away from dissociative processes by conceptualising many of these experiences as 'repression'. His psychoanalytic explanation of hysteria was that it was an active defence against conflict and it was this active defence theory of repression that was favoured during the earlier half of the 20th century, with Janet's passive defence idea largely ignored (Ross, 1996). This can be partly explained by a reluctance of society to acknowledge that trauma, particularly in relation to sexual abuse, could cause dissociative experiences.

Dissociation in the form of Janet's theorising fell out of favour but, the word itself caught on and dissociation began to be used as a catch all phrase which described some form of separation. Subsequently, when a clinical interest in hypnosis led to a resurgence of interest in Janet's original ideas, 'dissociation' was used in a variety of ways. Definitions included: describing behaviours and perceptions that occur outside of conscious awareness, an alteration in phenomenological experience that in some

way relates to a disconnection regarding the self or environment, Janet's original defence mechanism, and indeed Freud's which appeared to use the term interchangeably with repression .

This led to the bizarre situation of for instance, an expert driver being able to find her route home 'automatically' whilst simultaneously holding an involved conversation, being termed dissociation, as well as out-of-body experiences, being in a hypnotic state, and the act of a client being unable to remember past sexual abuse (e.g. Kihlstrom, 1994; Cardena 1994).

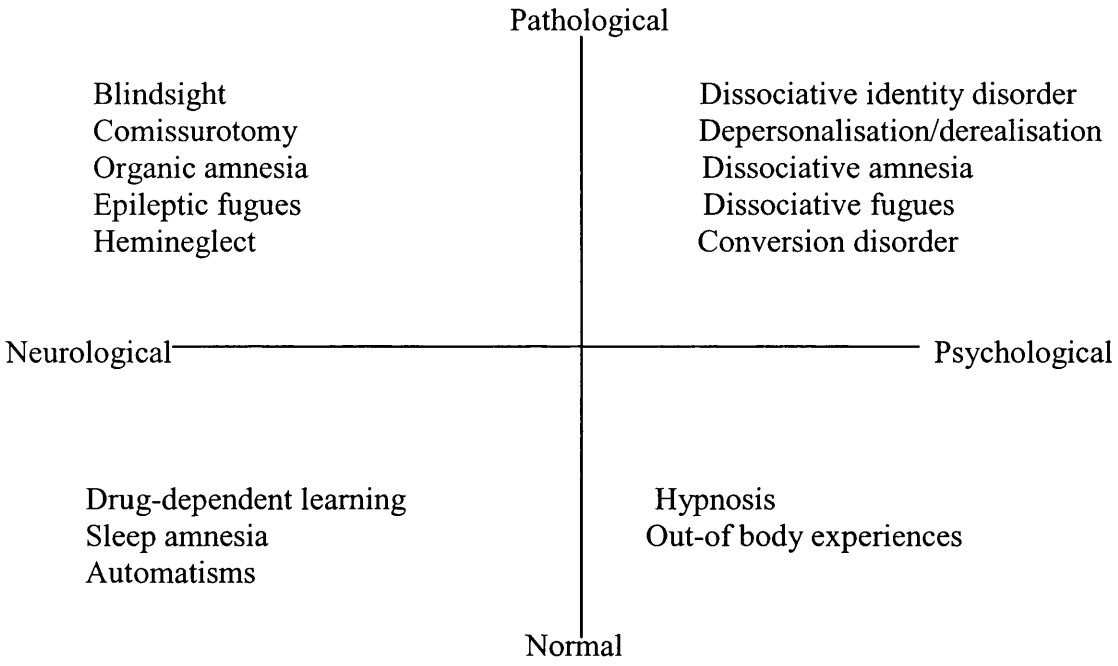
Before we endeavour to conduct research in this area it is vital that we are clear about the kinds of experiences that are encompassed by this term and what form of dissociation we are interested in.

Forms of dissociation

As we have discovered, the term is so very open semantically that dissociation is used as a descriptor for quite disparate phenomena. Cardena (1994) has usefully conceptualised dissociation for us (FIG 1) so that we can see dissociative phenomena arranged by whether they are usually viewed as pathological or normal, and whether their cause is deemed to be in the primarily psychological or neurological domain.

Figure One

A Diagram to Show Dissociative Phenomena



It is the right hand side of the diagram which will be our primary focus while exploring dissociation. The top quadrant contains the four syndromes that DSM IV currently labels dissociative as well as conversion disorder, which Cardena believes should be placed within the dissociative disorders spectrum (other syndromes which only contain elements of dissociative experience such as BPD are not included here). The lower quadrant contains phenomena which are 'primarily produced by psychological and social variables such as the deployment of attention, expectations etc.' (Cardena, 1994).

The upper left-hand side contains examples of dissociations that may come about through brain injury, and in the lower half, types of amnesia which are thought to come about through different psychobiological states. Whilst also interesting, these

will not be considered further and are presented here merely to display the variety of phenomena which have been termed dissociative.

Dissociative experiences

If we are only to examine those aspects of dissociation which are found in dissociative disorders and PTSD, we are still left with a variety of experiences. Gershuny and Thayer (1999) reviewed the various conceptualisations of dissociation and concluded that most researchers agreed that some forms of amnesia, depersonalisation (defined as the experience of feeling detached from one's mental processes or body) and derealisation (defined as an alteration or distortion of experience or perception of the external world so that is seems strange or unreal), are part of the dissociative spectrum. They found less agreement with identity confusion and alteration (proposed by Steinberg, 1995), absorption (Waller, Putnam & Carlson, 1996), and disengagement or spacing out (Briere & Runtz, 1993). Interestingly, the symptom of emotional numbing was also seen as controversial among researchers even though endorsed as definitely dissociative by the American Psychological Association (APA). Gershuny and Thayer argue this may be because the way it is conceptualised makes it similar to depersonalisation and derealisation.

Most measures of dissociation include all of the above suggestions.

Measures

A number of questionnaires have been developed to measure dissociative experience. Perhaps the best known is the Dissociative Experiences Scale (DES), first developed in 1986 by Bernstein and Putnam as a clinical screening instrument to detect

dissociative disorders. There is now an improved version, the DES II (Carlson & Putnam 1993).

According to their original research, it is evident that dissociation is not a unitary phenomenon and that there are at least three aspects to the overall phenomenology. Dissociation as measured by the original DES, consists of three factors:

i. Absorption-imaginative involvement, (experiences of enhanced concentration which are supposed to play an important role in hypnosis).
ii. Amnesia (experiences of memory lacunas).
iii. Depersonalisation-derealisation (includes experiences of feeling detached from one's mental processes or body and/or alterations or distortions of experience or perception of the external world so that is seems strange or unreal).

This means that the questionnaire contains items which range from 'some people have the experience of finding themselves in a place and having no idea how they got there' to 'some people sometimes find that they hear voices inside their head that tell them to do things, or comment on the things that they are doing.'

An alternative measure is The Dissociation Questionnaire (DIS-Q) (Vanderlinden ,1993) is a 63 item self-report measure of psychological dissociation which consists of four factors.

i. Identity-confusion fragmentation (Similar to depersonalisation/derealisation).
ii. Loss of control (experiences of losing control over behaviour, thoughts and emotions).
iii. Amnesia (as in the DES).
iv. Absorption (as in the DES).

More recent developments include a measure called the Somatoform Dissociation Questionnaire (SDQ) (Nijenhuis, Spinhoven, Van Dyck, Van der Hart, Vanderlinden, 1996), which is distinct from the 'psychological' dissociation questionnaires described above in that it is concerned with dissociative symptoms that directly involve the body and includes items such as: 'I feel paralysed for a while'. This questionnaire will not be considered further as it has not yet been extensively utilised in clients with PTSD.

For the clinicians wishing to measure dissociation it seems we must conclude that dissociation is composed of a number of factors and, according to these measures, that there are at least three aspects to the overall phenomenology.

The DES

Factor-analytic studies have found statistical independence between amnesia and depersonalisation and derealisation on the DES (Carlson et al., 1991; Frischolz, 1991), which suggests that the questionnaire is actually measuring at least two constructs.

Waller, Carlson and Putnum (1996) have argued that dissociation has been considered to be a continuum by clinicians and that measuring scales such as the DES help to endorse this view. They use taxometric findings to propose that actually, non-pathological dissociative experiences are manifestations of a dissociative trait whereas pathological dissociation is the result of a latent class variable. This means there will be two types of dissociative experiences measured by the DES.

Firstly a non-pathological type of dissociation which is on a continuum and appears to measure absorption and imaginative involvement. Secondly, the more pathological taxon which we would expect to be elevated in clients with psychiatric dissociative

symptoms, and which measures markers such as detachment and identity alteration. These distinctions are rarely made clinically when the DES is used and I propose to take account of this finding in this research study.

The difficulty with the field of dissociation is that researchers have tried to describe a number of phenomena as a unitary construct. One way of judging what psychologists have deemed to be dissociative is to examine the measures that are used to assess it. Unfortunately it seems, the most popular measure used (the DES) actually suffers from the historical confusion found in the field. The questionnaires that have been developed to measure dissociation have appeared before adequate definitions of dissociation itself.

An attempt to delineate dissociation

More recently, a group of psychologists have been meeting at UCL to discuss their understanding of the term dissociation (Holmes, Mansell, Brown, Fearon, Hunter, Frasquilho, & Oakley, 2002). They have drawn on a variety of researchers' suggestions including Allen (2001), Putnam (1997), and Kihlstrom (1994), and have suggested that dissociation should be replaced with a dichotomy of two qualitatively different concepts; 'detachment' and 'compartmentalisation'.

They suggest compartmentalisation is 'the coexistence of separate mental systems or identities that should be integrated in the person's memory, identity of consciousness.' Detachment should be viewed as 'an alteration in consciousness where the individual disconnects from their environment or themselves'. These two concepts are consistent with clinical observations, evidence from psychometric studies (Carlson et al., 1991; Frischolz et al., 1991; Ross, Joshie & Currie, 1991), and emerging biological evidence. (Sierra & Berrios, 1998; Brown, 2002a).

In order to investigate such a broad field, it is important to specify exactly what aspects of dissociation we are focusing upon. This study will only be considering dissociation at the time of trauma, as there is an agreement that trauma is in some way important for dissociation to occur later on (Van der Kolk, & Van der Hart, 1989; Kunzendorf, Hulihan, Simpson, Pritykina, & Williams, 1997-1998) Accordingly, I will be examining dissociation during trauma in greater depth throughout this thesis. This research will be most relevant for those who work with PTSD, but may also have a much broader application to other disorders in which dissociative phenomena occur.

Post-traumatic stress disorder

PTSD is a disorder which can only be diagnosed when a person has 'experienced, witnessed, or was confronted with an event that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others and....the person's response involved intense fear, helplessness or horror' *The Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV); American Psychiatric Association, 1994). Diagnostically, there are three clusters of symptoms which must be present in addition to a traumatic event (A). The B cluster includes re-experiencing symptoms such as intrusive memories of the trauma itself, and the more contentious symptom of emotional numbing. The C cluster includes avoidance, which may be cognitive, and/or behavioural avoidance of reminders of the trauma. The D cluster 'hyperarousal' includes symptoms like hypervigilance and sleep disturbance. These symptom clusters may be dynamically intertwined (Allen, 2001).

In a review of the trauma literature (Breslau, Davis, Andreski & Peterson, 1991; Elliott, 1997; Kessler et al., 1995; Norris 1992; Resnick, Kilpatrick, Dansky, Saunders

& Best, 1993), Gershuny and Thayer (1999) concluded that between 40% - 72% of the general population experience a traumatic event (such as a car-crash) during their life-time. As prevalence estimates for the psychological condition of PTSD range from 1% to 14% depending on the community studied and the methodology used (DSM-IV.,1994), it is clearly not just the traumatic event in and of itself which causes post-traumatic distress.

Why is it that some people go on to develop PTSD symptomatology and others do not? A number of risk factors have been isolated in the literature. These include pre-disposing risk factors such as a prior history of trauma, pre-morbid personality and exposure variables such as personal injury and life-threat, as well as peri-traumatic dissociation (dissociation at the time of trauma) (Green,1994; Litz & Roemer, 1996). This investigation is primarily concerned with dissociation and what happens during the trauma itself so a review of all the possible predictors is beyond the scope of this thesis. I propose that dissociation at the time of trauma is of key importance in predicting later psychological difficulties. The key evidence for this proposal is detailed below.

Peri-traumatic dissociation

Most researchers would agree that dissociative symptoms are an important aspect in long-term pathological responses to trauma. What is perhaps more contentious is the importance of dissociation *at the time of trauma.*

Grounded within the historical precedents, many researchers have felt that dissociation is a defense mechanism that helps the individual protect themselves against the horror of a traumatic event and have concluded that it would help to reduce long-term symptomology (Bremner & Brett, 1997). However, it has been

suggested that dissociation at the time of the trauma (peri-traumatic dissociation) is predictive of later pathological reactions (Van der Kolk & Van der Hart, 1989), and poorer outcome (Shalev, Peri, Canetti & Schrieber, 1996).

There are now a number of papers which suggest that dissociation at the time of trauma actually increases the propensity to suffer long-term psychopathology across a wide range of populations. These are considered further below.

Studies examining peri-traumatic dissocation

Bremner and Brett (1997) examined dissociative experiences during combat for a group of Vietnam veterans, comparing 34 who had a diagnosis of PTSD with 28 who did not. Those with a diagnosis of PTSD were found to have higher levels of current dissociative symptomatology (as measured by scores on the DES), significantly higher levels of dissociation at the time of combat (using DEM-Q a modified version of the DES which contained five items on depersonalisation, seven items on derealisation and one item on amnesia), and a higher number of flashbacks since their time in the Vietnam war. Flashbacks were measured by a semi-structured interview. Veterans were presented with a brief example of a flashback, and with the specific features of flashbacks and asked if they had ever experienced anything similar. Experiences were then categorised as flashbacks if participants had had the experience of hearing, smelling or seeing something from Vietnam that they felt was real but later realised they were imagining.

In this study, a positive correlation was found between the DEM-Q and later flashbacks ($r(31) = .55$, $p = .001$). This study provides support for a relationship between dissociating at the time of trauma and later re-experiencing. However, research in this area is plagued with methodological difficulties, not least that the

accounts of dissociation are retrospective and so we are unsure of the reliability of the reports. This is a particular problem for this study as the Vietnam war was so long ago. This study also relies on one method of collecting data; self-report.

Suffering from the same methodological problems was Marmar's 1994 study which also found higher levels of peri-traumatic dissociation in veterans suffering from PTSD but again, relied on veterans' memories of dissociating during a war 20 years previously. We know that retrospective research on memory is particularly problematic as the memories themselves may have been reconstructed in light of one's later experiences, or lost over time (Griffin, Resick & Mechanic, 1997) .

There is also the possible confound of the stress response itself and its measurement; that is, those who have extreme stress responses may recall more dissociation post-trauma than those who do not, as Marmar (1994), himself noted.

Some studies have tried to control for these factors however. In 1993, Holen conducted a long-term prospective study of survivors after a North Sea oil rig capsized, and discovered that that the level of self-reported dissociation during the trauma was a predictor of subsequent PTSD. In order to avoid the retrospective problems, Shalev et al. (1996) used a prospective design in their study. They assessed trauma survivors at 1 week and 6 months post-trauma. Their findings pointed to peri-traumatic dissociation as being *the* most important variable in explaining PTSD scores six months after trauma.

Griffin, Resick and Mechanic (1997), conducted research with women a week after they had been raped and found that those who scored highly on a Peri-traumatic Dissociation Index were more likely to have PTSD symptoms than those who didn't dissociate during the rape. This was a retrospective self-report measure but was only taken a week later. In addition, the researchers used an objective measure of

dissociation, that of heart-rate. They found that those who were high in dissociation, evidenced a drop in heart rate when talking about the rape.

Other researchers have tried to control for retrospective problems statistically, finding that the risk for PTSD associated with peri-traumatic dissociation is independent of the risk from prior PTSD (Ursano et al., 1999) and general dissociative tendencies (Marmar et al., 1997; Marmar, Weiss, Schlenger, Fairbank, Jordan, Kulka & Hough 1994).

More recently, peri-traumatic dissociation has also been suggested to significantly account for increases in PTSD symptoms beyond other symptoms such as years of experience and social support (Marmar, Weiss, Metzler, Delucchi, Best & Wentworth, 1999).

While a number of these clinical studies suffer from various methodological problems, on balance there appears to be enough evidence to suggest that, as Janet proposed, dissociation increases risk to the individual.

A number of researchers, then, have found a link between dissociation at the time of trauma and later psychological difficulties. Why should this be so? In 1997, Murray suggested that one possibility is that peri-traumatic dissociation may be predictive of later intrusive memories or flashbacks. Other researchers also agree with this proposal (e.g. Ehlers & Clark, 2000).

What are Intrusive Memories?

Flashbacks or intrusive memories of traumatic events are one of the hall-mark symptoms in clients with a diagnosis of PTSD (DSM IV). When these occur, clients re-experience the traumatic event against their will.

These involuntary, intrusive autobiographical memories are more common in this client group, and compared to controls they report memories which are more distressing and intrude more frequently (Brewin & Andrews, 1998). These memories are a major focus of treatment in psychological therapies for PTSD (Foa, Keane & Friedman, 2000).

Examining peri-traumatic dissociation and intrusive memories under experimental conditions

The confounds with retrospective clinical research have led to an interest in experimental manipulation of peri-traumatic dissociation in order to attempt to control for some of these difficulties. The first was conducted by Murray in 1997. He asked participants to dissociate whilst watching a stressful film of road traffic accidents (RTAs) or simply view it normally. Participants in the dissociation condition were asked to emulate a number of dissociative phenomena, including making themselves feel emotionally numb, detached, as if they were someone else as if their arms were heavy and as if they were outside their own body.

Murray found no differences between his control condition and the dissociation condition in reported intrusive memories the following week. Participants were unable to dissociate 'to order'. It appears that the task was too difficult for the participants, possibly because there were so many unusual tasks and they were given no opportunity to practice.

Holmes (2000) attempted to improve on his methodology using a dot staring task developed by Leonard et al.(1999) to induce dissociation, and she also gave all her participants opportunity to practise dissociating. They were then allocated to one of three conditions: in the first participants were instructed to view the film as they normally would, in the second they were instructed to dissociate, and in the third they were asked to perform a visuo-spatial task (in which they tapped a sequence of keys on a MOAR box throughout the film). Participants then completed a diary of their intrusive memories during the following week. She found that those participant's who were asked to perform a visuo-spatial task whilst watching the video reported less spontaneously occurring memories of the film, than those in the other conditions. However, being allocated to the dissociation condition failed to significantly influence the frequency of intrusive memories, though it should be noted that while the differences reported were not significant the trend was in the desired direction and a possible increase in power may have revealed an effect. In addition, natural variations in spontaneously occurring dissociation across conditions, did predict later intrusive memories. Accordingly, Holmes (2000) suggested utilising a more powerful task to manipulate dissociation, such as a pharmacological agent or some form of hypnotic induction. Hitherto, there has not been a successful manipulation of dissociation during analogue trauma.

For clients with PTSD, it is vital that we understand what is happening during trauma and how dissociation may impact on intrusive memories. For this reason, I decided to conduct two studies which would attempt to manipulate dissociation in the laboratory. One to increase dissociation and later intrusive memories, and one to decrease dissociation and later intrusive memories. These experiments will follow a similar experimental methodology to Holmes and Murray's, (that of exposure to stressful

films) and will be described in detail in chapters two and three respectively. Both studies will examine whether the manipulation of dissociation in the laboratory is possible, and whether dissociation acts as a mediator to later spontaneously occurring intrusive memories.

When designing these experiments it was extremely important to consider how state dissociation would be measured.

How can we best measure peri-traumatic dissociation?

The DES is the most commonly used measure to assess dissociation, but it has the flaw described earlier. In addition, it does not actually provide us with any information as to what the clients are feeling at the moment in question. In effect, it is a trait measure.

One measure that was developed to specifically assess alterations in level of state dissociation has been termed The Dissociative State Subscale (DSS) (Holmes, 2000). This consists of the 19 subject-rated items from the Clinicians Administered Dissociative States Scale (Bremner et al., 1998). The items have satisfactory reliability (Cronbach alpha = 0.94) and validity (Bremner et al., 1998).

Another scale is the Peri-traumatic Dissociation Experiences Questionnaire. PDEQ (Marmar, 1994).This is a self-report measure consisting of 10 items that are designed to assess dissociation at the time of trauma. In a prospective study of the PDEQ Shalev et al. (1996), report item-to-scale correlations of .31 to .62 and a Cronbach alpha coefficient of .77. Both these scales are necessarily subjective, and so recently researchers have been trying to use a more objective measure of heart rate to measure dissociation (Griffin et al., 1997; Holmes, 2000). Objective indicators may help us elucidate whether there are specific elements of post-trauma pathology that inhibit

recovery from trauma and lead to chronic PTSD. Griffin et al. followed that line of reasoning and postulated that dissociation is a coping strategy used during severe trauma as those who were higher dissociators in their study had a higher perception of life threat. The individuals who had been raped and were high in dissociation also showed a significant suppression of autonomic physiological responses as measured by heart rate. This may mean that when dissociation is studied in the laboratory, it should be measured both phenomenologically and psycho-physiologically in order to ensure what we are measuring is similar to that in the clinical population (i.e. that it has ecological validity). This is precisely the methodology followed by Holmes (2000). Although her manipulation of dissociation was unsuccessful, Holmes also measured the intrusive memories which occurred due to natural state dissociation. She found that both the objective (HR) and subjective (DSS) measures of dissociation significantly and independently predicted later intrusions. She postulated that the measures may be measuring different kinds of dissociation.

The use of stressful films in research

That this research has ecological validity is highlighted by the fact that a significant minority of people involved in road traffic accidents (RTAs) go on to develop PTSD (Ursano, Fullerton, Epstein et al., 1999). Due to the frequency of this kind of trauma, persons involved in accidents greatly increase the incidence of PTSD (Norris, 1992). This underscores the relevance of RTAs for traumatic event research. For ethical reasons, we can never induce a situation in which a participant is confronted by a threat to their physical integrity, but we can allow them to witness a threat to others. One criticism of utilising stressful films for research is that they may not produce the expected results because the films are not relevant to participants (Harvey & Bryant,

1998); accordingly, when conducting this type of research, a rating of the personal relevance of car crashes needs to be included (Holmes, 2000; Davies & Clark, 1998).

A theoretical explanation for the experience of intrusive memories in PTSD

Brewin (2001) suggests that flashbacks appear to reflect a self-contained form of memory that may not interact with general autobiographical knowledge, giving the example of PTSD patients who may re-experience being assaulted by a mugger as if at the present moment, even if they know that the mugger is actually in prison. He explains this finding through recourse to Dual-representation Theory (Brewin, Dagleish & Joseph, 1996).

This theory proposes that there are least two types two memory systems; Verbally Accessible Memory (VAM) and Situationally Accessible Memory (SAM).

VAM supports ordinary autobiographical memories that may be retrieved automatically or through the use of deliberate strategic processes. These memories can be edited and interact with the rest of one's autobiographical memory base. The SAM system supports specific flashbacks and trauma-related dreams and is formed from a more non-consciousness perceptual level of processing of trauma and it is this system which would support the experience of intrusive memories. The SAM system is relatively more sensory and visuo-spatial than the verbally based VAM system. Because a verbal code is not used it is difficult to communicate these memories to others and the memories may not necessarily interact with other autobiographical knowledge. Rather, the knowledge in the memory is more 'situationally accessible' and accessed automatically (or triggered) when a person is in a context which reminds them of the original trauma.

Dual-representation theory would make the prediction that hindering information in a traumatic event from entering the VAM system by dissociation should interfere with the creation of detailed verbally accessible representations. When participants encounter trauma related cues, the impoverished VAM representations would be less effective in inhibiting later spontaneous intrusions that are based on a representation stored primarily in the SAM system. In addition it would also predict that a task which would primarily disrupt VAM encoding during a trauma would lead to an increase in intrusive memories

Hence, it is proposed that dissociation disrupts the formation of VAMs and that this will lead to more intrusions as it is the SAM system which supports the formation of specific flashbacks and intrusive memories.

In the experimental study described earlier, Holmes (2000) found that participants, who viewed a stressful film while performing a visuo-spatial task, experienced significantly fewer intrusive memories a week later than those who did not perform such a task. This is because cognitively, there is presumed to be limited visuo-spatial capacity (Brewin & Saunders, 2001; Holmes & Brewin 2001). The SAM system uses visuo-spatial cognitive resources, and the tapping task was postulated to compete for these, and to disrupt the formation of memories within the SAM system.

Emotional Numbing

Emotional numbing is also one of the key symptoms in PTSD, but the functional relationship between emotional numbing and other classes of symptoms in PTSD is not clearly understood (Litz, Schlenger, Weathers, Caddell, Fairbank, & LaVange, 1997). It has been conceptualised as belonging to both the hyperarousal (D)(Litz 1992, Litz et al., 1997; Flack, Litz, Hsieh, Kaloupeck & Keane, 2000) and avoidance

(B) cluster of symptoms (DSM IV). Emotional numbing is also a key factor in dissociative experience and, indeed, is sometimes used interchangeably with dissociation. For example, in 1998, Ehlers, Mayou, and Bryant found that peri-traumatic dissociation in survivors of RTAs related to later PTSD diagnosis and severity. They measured peri-traumatic dissociation using two questions which ascertained the extent to which victims were dazed and/or numb.

Emotional numbing has also been found to be the most statistically significant distinguishing symptom between accident survivors with ASD who went on to develop PTSD and those who did not (Harvey & Bryant 1998). Depersonalisation and derealisation were also found to be significant, perhaps suggesting emotional numbing best belongs with dissociative phenomena. Litz (1992) reviewed emotional numbing in people with combat-related PTSD and concluded that there are differing opinions across researchers on its physiological, experiential and behavioural features, and about how emotional numbing relates to emotions of different valence. He found there were three major theories which attempt to explain the role of emotional numbing in PTSD. The behavioural theory would suggest that emotional numbing is caused by the avoidance of reminders of, and reactions to, traumatic events (Keane, Fairbank, Caddell, Zimering & Bender, 1985), which would explain why emotional numbing is typically placed within the avoidance cluster of symptoms. However empirical studies using factor analysis have demonstrated that numbing actually loads on the same factor as hyper-arousal symptoms (Foa, Riggs & Gershuny, 1995; Taylor, Kuch, Koch, Crockett & Passey, 1998).

Animal models suggest that emotional numbing could be viewed as a conditioned analgesia in response to inescapable shock (Foa, Zinbarg & Rothbaum 1992). This is

an attractive proposition as it makes parsimonious sense of the phenomena, however there is still no experimental evidence to suggest this exists in humans.

Lastly, information-processing theories such as that proposed by Horowitz (1986) suggest that emotional numbing occurs in response to the aversive emotions which are associated with re-experiencing, and should be viewed as a completely separate phase of adjustment. Flack et al. (2000) refute this by drawing attention to studies like Joseph, Yule and Williams' (1995), which have failed to empirically demonstrate that emotional numbing is a separate stage of adjustment.

Other theories have suggested that emotional numbing symptoms are only present because of other diagnoses which often accompany PTSD such as substance abuse and depression (Flack, Litz, Hsieh, Kaloupeck & Keane, 2000). Evidence against this theory is provided by Feeny, Zoellner, Fitzgibbons and Foa (2000). They assessed symptoms of depression, emotional numbing and dissociation in 161 women who were victims of assault within the previous month. High levels of emotional numbing (measured using three items on the PTSD symptom scale interview: lack of interest in activites, emotional disengagement from others and lack of emotional reactivity) at this time were predictive of PTSD severity three months later. Regression analyses revealed that early emotional numbing contributed to the prediction of PTSD even after depression and dissociation were accounted for. We can conclude then that not only should emotional numbing not be used interchangeably with dissociative terminology, but that its presence is not simply due to clients' symptoms of depression.

A new theory proposed by Litz in 1997 posits that emotional numbing is the result of emotional depletion caused by chronic hyperarousal. This would account for factor-analytic studies placing emotional numbing on the same factor as hyperarousal. By

using regression analysis Litz found that hyperarousal symptoms, compared to avoidance symptoms and comorbid depression and substance misuse, were the most robust predictor of emotional numbing , this implies there is a substantive relationship but does not necessarily mean a causal link.

The field has suffered from the uncertainty as to why emotional numbing is present, and there is no clear operational definition of emotional numbing. However, researchers do agree that it always involves impaired responsiveness to stimuli which are particularly emotive. Owing to the lack of clarity about this experience, adequate measures do not exist to assess it. Hence, if we wish to assess this aspect of the dissociative experience, we will have to be exploratory and create a simple measure. Fear and depression have both been suggested to be of key importance in PTSD, (e.g. Foa, Steketee & Rothbaum, 1989; Sharpe, Tarrier, & Rotundo, 1994; Ehlers & Clark, 2000, etc.) so taking a rating of both emotions during the experiment is important. A more exploratory aspect of this research could be to examine a range of emotions, in order to understand how each is affected during a stressful event.

Conclusion

Dissociation is a term that has been used to describe a variety of phenomena, which has lead to confusion within the research field. Dissociation and trauma have been linked (e.g. Van der Kolk, & Van der Hart, 1989; Shalev, Peri, Canetti & Schrieber, 1996), but the role of dissociation during trauma is still in debate firstly due to the retrospective nature of the majority of research and secondly because of the use of a trait dissociation measure which may not be measuring pathological dissociation (the DES). This thesis will examine state dissociation at the time of trauma and will endeavour to ascertain the role of dissociation in relation to later intrusive reexperiencing, by gathering concurrent information about participants intrusive

memories over the following week. This will eliminate the methodological difficulty of gathering retrospective data. A similar paradigm has been used in the laboratory previously (Murray, 1997; Holmes, 2000; Brewin & Saunders, 2001). In order to explore dissociation in the laboratory, two studies were devised, the first aims to explore how we may possibly reduce peri-traumatic dissociation by using a visuo-spatial task similar to Holmes (2000) study. Dual-representation theory would predict a protective effect of a visuo-spatial task through a decrease in later intrusive memories. The second study aims to increase one form of dissociation (and hence, later intrusive memories) by hypnosis. Dual-representation theory would predict that an increase in dissociation would disrupt encoding in the VAM system and hence lead to a greater numbers of spontaneously occurring intrusions over the following week. Each study will also examine the role of emotional numbing by attending to the mood experienced by participants while watching traumatic videos. Unlike the previous laboratory research, this study will use a within-subjects design in order to increase the power of the study and decrease potential confounds of extraneous variables due to individual differences. Study one will be described in the following chapter and study two will be described in chapter three. The studies will both utilise a modified version of the DES, the DES-T in order to ascertain if a more pathological form of trait dissociation will predict later intrusive memories.

CHAPTER TWO:

DECREASING DISSOCIATION THROUGH USE OF A GROUNDING TECHNIQUE (STUDY ONE)

INTRODUCTION

(STUDY ONE)

How can we reduce dissociation?

Helen Kennerley (1996) suggests a number of ways to help clients develop a range of techniques for coping with dissociative experiences. One of these is the use of a grounding object. This can be any object which is pleasant, portable and associated with the present. She recommends soft toys, herb bags or stress balls, but any object which the client chooses would be acceptable as long as it cannot be used for self-harm, or remind the client of past traumatic events.

Refocusing is also recommended. Put simply, the client attends to an aspect of the environment around them in order to focus their awareness on the present and distract from painful affect and/or images. They may, for example, concentrate upon book titles on the shelf, or the colour and texture of curtains. Refocusing would not be appropriate to use in a laboratory task however, as participants will be required to look at a television screen.

What is the evidence for usage and efficacy of grounding objects?

Society in general endorses the use of grounding objects, as evidenced by the multitude of malleable objects designed to relieve 'stress', and the uses of South American 'worry dolls'. There is no doubt that clinicians and clients also perceive the use of grounding objects as helpful. I collected pilot survey data, amongst 14 trainee clinical psychologists and five qualified clinical psychologists by asking them to suggest what they might use (or have used) to help 'ground' a client who is

dissociating in the therapy room. Refocusing was their first choice, followed by use of an object. When I enquired as to what object, the one that was suggested most frequently, by twelve respondents was Plasticine. I found this a curious result, as to my knowledge there is no empirical evidence to support the use of Plasticine during therapy, outside of child and family services.

Use of Plasticine in therapy

I identified the only recent article in PSYCHINFO which suggests utilising Plasticine in connection with dissociation; this was published in 1993 by Yolanda Gampel. Her thinking is placed within the psychoanalytic tradition, and she believes that the psyche has levels, the most archaic of which cannot be accessed through verbal forms of expression. She took the idea of using Plasticine therapeutically from an earlier researcher, Pankow, who first used modelling materials in 1956. Gampel discovered that clients often disclosed their 'most vulnerable and dissociated aspects while using the modelling technique'. Plasticine was viewed as a concrete factor that was used in therapy to touch upon regressive states (perhaps because it was last used in childhood) and eventually to encourage the client to develop a sense of 'containment and oneness.'

'Through modelling we very quickly come into contact with proprioceptive images which have not yet been expressed verbally, and which at times are only expressed in parts of the body and not in the body as a whole'. (pp 281)

Gampel postulates that Plasticine enables a patient to focus their attention upon 'some remainders of the 'radioactive'influences of the external world which remain within the patient.' (radioactive is defined as 'those influences of the external reality that

enter our psychic apparatus without our having any control over their entry, implantation or effects').

Perhaps here is an unconscious recognition that there could be two memory systems similar to those proposed by Brewin, Dalgleish and Joseph (1996). Their theory would predict that any object which competed for resources in the SAM system would make it more likely that VAM memory could be accessed.

Due to the paucity of the literature, there is then, no current empirical evidence to support the use of Plasticine as a therapeutic technique. However, the use of Plasticine appears to have become one of those practices which clinicians regard as having proven efficacy, by virtue of being in use for a long time, and anecdotal evidence. Holding clinicians' tried and tested clinical practice in high regard, I concluded that it would be useful for us to begin to examine the possible benefits of using Plasticine and start to hypothesize about why it may be useful.

Given that Plasticine is usually utilised when clients are dissociating (Kennerly, 1996; Linehan, 1993) my starting hypothesis was that the manipulation of Plasticine acts to decrease dissociation.

In order to test this hypothesis experimentally, a study was designed utilising a similar paradigm to Holmes (2000). Participants will be asked to watch two films of stressful road accidents, one to be viewed normally and one to be viewed whilst they manipulate a piece of Plasticine. They will then be asked to record their intrusive memories for a week after the experiment before attending for a follow-up.

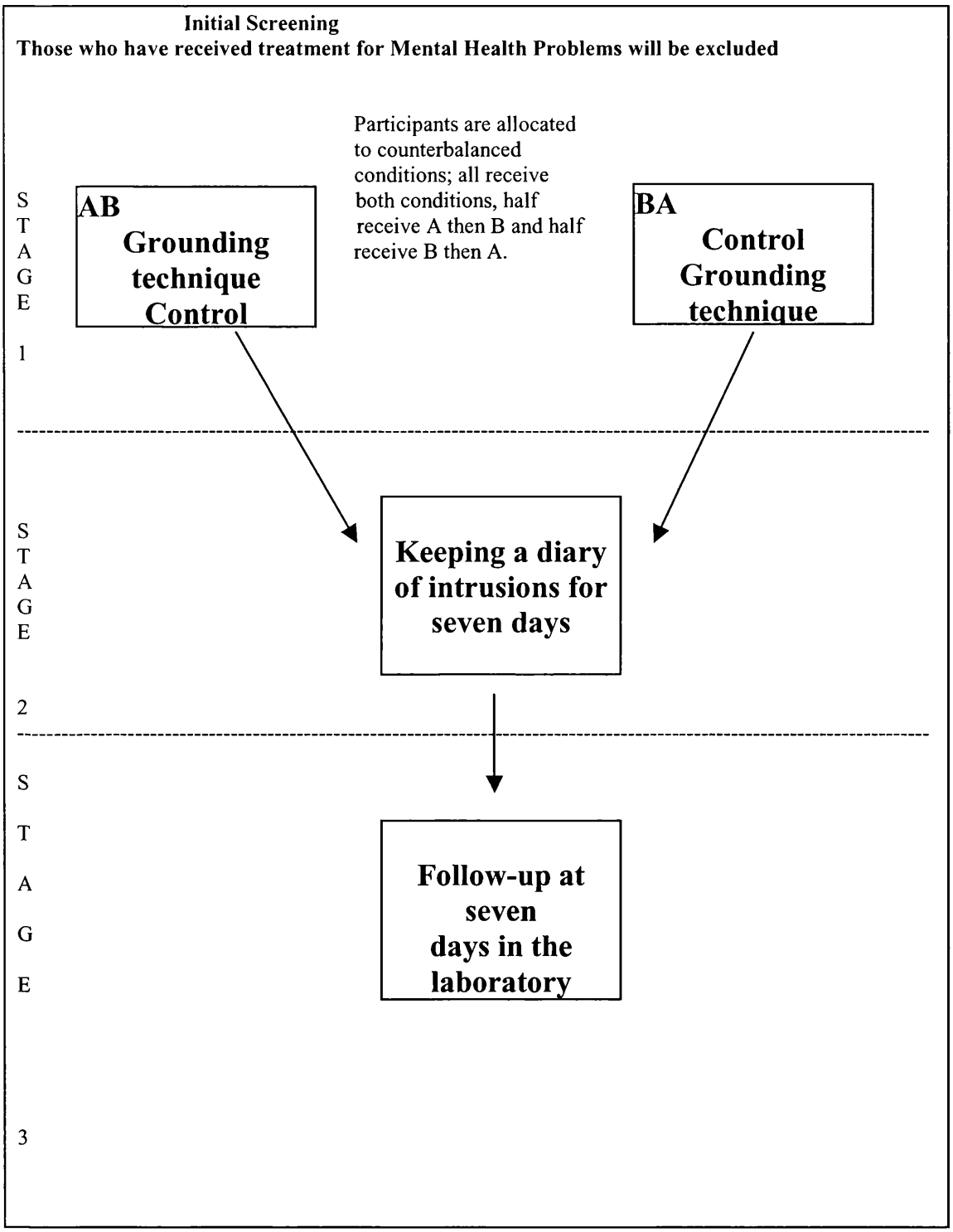
We know that clinicians use plasticine manipulation to help clients when they are dissociating. Dissociation has been suggested to lead to increased re-experiencing of trauma in PTSD (Murray, 1997; Ehlers & Clark, 2000), hence, it is predicted that

decreasing dissociation through manipulation of Plasticine will lead to fewer intrusive memories over the following week.

Summary of introduction

Grounding objects have been used in clinical practice to help clients when dissociating. There is currently only anecdotal evidence to support their use. Accordingly, a study has been designed to test whether Plasticine can reduce dissociation occurring to a traumatic film. Participants' dissociation will be measured during a film in which they manipulate Plasticine and during a film which they view normally (the control). Evidence first presented in chapter one (Murray, 1997; Ehlers & Clark, 2000), suggests that dissociation at the time of trauma should lead to a greater number of intrusive memories. It is therefore predicted that participants will experience fewer intrusive memories over the following week from the film in which they manipulated Plasticine than from the control film.

Pictorial overview of the experiment



SPECIFIC HYPOTHESES AND MANIPULATION CHECKS

The hypotheses that have been developed from the literature presented in this chapter and chapter one are summarised below for clarity.

Manipulation check

Hypothesis one a) : State dissociation

- It is predicted that participants will dissociate less during condition 1 (grounding task) than during condition 2 (viewing the film without a task) as manipulating Plasticine is hypothesized to reduce dissociation. This will be measured by post-condition DSS and PDEQ scores, with higher scores indicating more dissociation.

Control of other variables

Attention

- Attention ratings will be taken for both films to ensure that any differences found in dependent variables are not simply due to the attention paid to the film in each condition.

Memory tests

- Recognition and Recall Memory measures will also be taken to ensure the grounding task does not act as a distractor while the participants watch the film. This will ensure any differences found in later intrusive memories across conditions are not simply due to the participants failing to encode the film.

Main experimental hypotheses : Intrusive memories

Hypothesis two: State dissociation and intrusive memories

- As peri-traumatic dissociation is postulated to increase later intrusive memories, intrusions of the film seen in the grounding condition will be of a lower frequency than those in the control condition as indicated by a smaller total number of intrusions in one week and fewer days with intrusions.

Hypothesis three: Trait dissociation and intrusive memories

- Trait dissociation as measured by the DES is not predicted to lead to a greater incidence of intrusive memories over the following week. Hence, participants with a greater score on the DES will not have a greater number of intrusions over all.
- The pathological form of trait-dissociation as measured by the DES-T is predicted to lead to a greater incidence of intrusive memories during the following week.

Hypotheses four and five: emotional numbing

Hypothesis four: Mood

- During the grounding film, participants will experience less peri-traumatic emotional numbing as measured by their negative mood ratings, than when they perform no task during the film. Therefore post-film negative mood rating will be higher.

- In particular, during the grounding film participants will be significantly more depressed and fearful than during the no task film.

Hypothesis five: Distress

- While performing the grounding task, participants will obtain higher distress ratings for the film during which they perform the grounding task than the film which they watch with no task.

METHODS

Overview of methods

This section describes the demographics of participants and how they were recruited. It continues by describing the apparatus, the measures used, and the full procedure of the experiment in order to ensure enough information is available for replication.

Design

This study used a within-subjects design with two conditions counterbalanced for order (grounding/control). In order to obtain two videos which could be used for this design the video which was used in Holmes (2000)' study was split into two tapes. Rather than splitting the tape by time it was split by the probability of participants experiencing an intrusive memory to each scene by using Holmes' previous data. For example, four kinds of intrusive images were reported to have occurred in response to scene one but only two types of intrusive images occurred in response to scene three in Holmes' study. Accordingly, the first video tape was allocated scenes 1, 2 and 3 and was 8 minutes long and the second was allocated scenes 4 and 5 and was 5 minutes. This ensured that the probability of experiencing an intrusive memory to either video was approximately equal.

To ensure that any differences found were due to experimental manipulation and not simply because of the video-tape viewed, the assignment of tape to condition was also counterbalanced.

Participants

Participants were recruited by advertising via posters on campus, most of those who responded were students at the University of London, though seven non-students were recruited. Their occupations were: journalist (1), librarian (1), artist (1), psychology assistant (1) and market researcher (3). The students studied a variety of subjects: engineering (1), war studies (1), medicine (1), pharmacy,(1) languages (1), archaeology (1), neurology (1), maths (1), economics and statistics (1), psychoanalytic studies(1) and psychology (3). Four participants were excluded after recruitment and before entering the experiment for having or having previously had, treatment for a Mental Health Problem.

In total, 20 participants took part with an age range of 20-44. The mean age was 24.5. Of these 13 were male and seven were female. 11 identified their ethnicity as 'white British', two white European, one white Brazilian, one Pakistani/Bangladeshi, one Anglo/Indian/Jamaican, one Hispanic, one American and two Indian. All participants attended for the follow-up a week later.

All participants received five pounds for taking part in the study and ethical approval was gained from the University College London Hospitals NHS trust ethics committee.

Apparatus

- Computer-driven Sharp video recorder and a 55cm x 40cm. Nicam Television.
- Two videotapes of road traffic accidents which were created from the single videotape utilised in Murrays' (1997) and Holmes'(2000) studies. (For a full description of the scenes please see Appendix one)

- Red, blue, yellow, purple, black and white modelling clay displayed as six lumps on a round tray
- Two plastic tubs, one 5cm depth, one 10cm depth
- Bell to summon experimenter

Measures (copies of all the scales are contained in Appendices 2-10)

- The Trait Dissociation Questionnaire (TDQ). This was developed by Murray in 1997. It contains 38 items pooled from pre-existing questionnaires such as the DES (Bernstein & Putnam, 1986) and further items based on DSM-IV criteria. He reported a test-retest reliability of .87 in a student population and an alpha co-efficient of .93. He also found it predicted PTSD in patients who had been in a RTA.
- Dissociative Experiences Scale (DES II) (Carlson & Putnam, 1993), this was included as another measure of trait dissociation and for ease of comparability across other studies. It is a 28 item self-report scale. In a meta-analytic study of over 100 studies in dissociation, Van Ijzendoorn and Schuengel, (1996) found that the DES seems to measure current view on past dissociative experiences. Convergent validity is excellent as the overall combined correlation across different measures was r= 0.67.(PAS TAS QED) and also semi-structured interviews. (SCID-D and DDIS).Mean alpha reliability was 0.93 in 16 studies. This means the DES II is a consistent scale.
- Dissociative State Subscale (DSS). (Holmes & Brewin 2001) This is the 19 Subject-rated items from the Clinician Administered Dissociative States Scale. (CADSS). (Bremner et al., 1998). This scale has the benefit of being designed to be administered as a repeated measure. It has satisfactory reliability

(Cronbach alpha = 0.94) and validity. The eight observer items were not utilised in this questionnaire as Bremner et al. had found it to have poor reliability.

- Peri-Traumatic Dissociative Experiences Questionnaire PDEQ (self-report). (Marmar, Weiss & Metzler, 1997) this is a ten item self-report measure. It has been demonstrated to be internally consistent, strongly associated with levels of stress exposure and with other measures of traumatic stress response (DES, and the Impact of Events Scale (Horowitz et al., 1979)). It has been included for ease of comparison with other studies as it is the measure which has been used most often in recent studies of peri-traumatic dissociation.
- Mood ratings. Participants rated how they felt at that moment in time on a variety of mood states. The scale was 0 = not at all to 10 = extremely. The moods were: happy, anxious, depressed, angry, fearful, horrified, helpless, disgusted, ashamed and guilty.
- Personal relevance of car crashes. Participants rated how relevant they thought car crashes were to their lives on a scale of 0 (not at all) to 10 (extremely).
- Attention to the film. Using a ten point scale participants rated how much attention they paid to the film, from none at all to total attention.
- Attention to the grounding task. Again utilising a ten-point scale, participants rated how much attention they paid to the grounding task, from none at all to total attention.
- Task compliance. The number and shape of cubes and pyramids created during the Plasticine manipulation was calculated and their efficacy was rated on a 4-point scale.

- Distress during film rating. On a scale of scale of 0 (not at all) to 10 (extremely), patients rated how distressed they were during the film.
- Seven Day Diary. This was the main outcome measure. Participants were asked to note both the frequency of their intrusive memories and the number of days on which they were experienced . This was based upon the diaries used for the previous experimental studies (Brewin & Saunders, 2001; Holmes, 2000). Additional information about how the intrusions themselves were experienced was also gathered. Records were kept on whether the intrusion was an image or thought or both. Participants used a scale of 0-100 to rate how distressed they were by the intrusion.

Measures presented during follow-up

- Experimental demand. This was a question to control for experimental demand, on a scale of –10 to 10 (where 10= extremely decrease 0= do nothing and 10 = extremely increase). Participants were asked to rate: 'how much do you predict that making shapes with Plasticine during a film (rather than watching it normally) would increase or decrease intrusive images of the type recorded in your diary?'
- Intrusion description questionnaire 2001. This was developed from a questionnaire used by Holmes (2000). Participants were asked to explain their most significant image in their own words.
- Diary compliance rating. This was a ten-item scale with a range 1(not at all true of me) to 10 (completely true of me) Participants were asked to rate where they would fall on the scale to the statement: 'I have often forgotten (or have been unable) to record my intrusive thoughts or images in the tick diary'.

- Cued Recall Memory and Recognition Memory Tests (2001). These questionnaires were developed for this film by the experimenter and Richard Hennessey (a 2nd year clinical psychology trainee, who also used the questionnaires for his study). The cued recall test was based on Saunders Explicit Memory Questionnaire (2001) and will be used to examine whether there are differences in memory for the film in the dissociation induction and control conditions. (See below for more information on how this questionnaire was developed).

Development of the Memory Tests.

Before running the experiment it was decided that a new memory questionnaire needed to be devised to assess participants' recall of the videos they had watched. Both Brewin and Saunders (2001) and Holmes (2000), had used an explicit memory questionnaire designed specifically to assess memory of the video but this questionnaire appeared to suffer from a floor effect as participants often achieved very low scores. Additionally, it did not seem to be representative of a true memory questionnaire as the questions were assessing different kinds of memory. Accordingly, it was decided to design two new questionnaires which were both more representative of psychological models of memory and easier for participants to gain higher scores. Two pilot subjects were asked to watch the video, record their intrusive memories in the diary and then complete the questionnaires a week later. One participant answered 65% of the questions correctly and the other correctly answered 70%. These preliminary results suggest that this questionnaire does not suffer from floor effects.

As this questionnaire is only a control for the study and not testing a hypothesis in and off itself, it was deemed inappropriate to pilot the questionnaire extensively to ensure its reliability and validity.

Procedure

Stage 1- prior to observing the video

This experiment was conducted in a laboratory located within a Health Centre. Participants sat in a chair at a table with a computer arranged on their left-hand side and the TV screen directly in front of them. Prior to meeting the participants, the experimenter had counterbalanced the order of presentation of the videos and the grounding technique by alternating the video and condition presentation for each participant number. Those who received the grounding technique first were allocated to condition one, those receiving it second, condition two. Hence, participant one received condition one and video one, participant two condition two and video two, participant three condition one and video two and so forth.

1. All participants read the participant information sheet and were given an opportunity to ask questions.
2. The informed consent form was signed by both experimenter and participant. Participants who had a mental health problem, or who had been diagnosed with one in the past were excluded at this stage.
3. The Dissociative Experiences Scale (DES) was then completed.

For those receiving the grounding technique first, the experimenter said:

''On the tray in front of you are a variety of coloured pieces of Plasticine, pick the one you find most attractive, and would most like to touch (Participant then indicated a colour).

While you are watching the video I would like you to alternate making small pyramid (experimenter demonstrated) and small cube shapes (experimenter demonstrated). Please begin with a pyramid. Once you have made one I would like you to put it in the tub on the right. Then make a square and place it in the left-hand tub. Use the Plasticine to make as many shapes as you can and continue throughout the whole duration of the video. The reason for doing this is that people often find it reassuring to be manipulating an object when they are feeling stressed.

Be careful to ensure that you are looking at the video while you are making the shapes. You do not need to look at the tubs, as they are very different heights; the one on the right for the pyramids, is much taller than the one for the squares on the left Go ahead – try it out'.

4. The participant was then observed making shapes whilst looking at the screen. When the experimenter was satisfied that they could perform the task, the experiment continued.

The experimenter then said:

You will now be asked to complete some questions on the computer screen. After which, you will see the film. ***Remember to pick up your Plasticine and start making shapes as soon as the film starts. The computer will warn you to do this just prior to the film starting. You stop making shapes when the film ends.***

Then you will be asked to complete some more questions on the computer. There are a lot of questions to answer so try to give the first response that come to mind and answer as swiftly as possible without rushing. You cannot change answers or go backwards. Inform the experimenter at the end of any mistakes if necessary. Do not look around the room. I am only outside the door, and will be checking things are progressing smoothly by using this peephole (experimenter points to keyhole). You can stop at any point and ring the bell to get the experimenter. This section should take about 25 minutes in total"

For those participants in condition two the experimenter instructed the participant in the same way as the boxed text directly above, ignoring the highlighted text pertaining to Plasticine.

5. The experimenter set the computer program to start. The lights were turned off and the participant left alone in the room.
6. The experimenter sat outside the door in case the participant called for them.

Stage 2 – computer administered questionnaires and video

The following questionnaires were presented on the computer.

- Trait Dissociation Questionnaire (TDQ).

- State dissociation questionnaire (DSS).
- Personal relevance of car crashes.
- First Mood ratings (all ten).

All participants then watched the first video either with or without the grounding task depending on whether they had been allocated to Condition 1 or 2.

Stage 3 – After the video

Participants then completed the following questionnaires and ratings on the computer

- State dissociation questionnaire (DSS).
- 2nd Mood ratings (all ten).
- Attention paid to film rating.
- Distress caused by film rating.
- Attention paid to task rating.

1. The experimenter then re-entered the room and asked the participant to complete the PDEQ on paper.
2. Participants then watched the second video and then repeated stage three. They were assigned to a new task which they had not completed previously, i.e. if they completed watching the video with the grounding task they then watched the video without the grounding task and vice versa.
3. The experimenter explained how to complete the seven-day diary, stressing that it was really important in terms of developing an understanding of clinical intrusions

that they complete it at least daily. The experimenter also ensured that the participant understood the difference between an intrusive image and a thought.

4. An appointment was made for the follow-up in seven days time. The experimenter's contact phone number was written on the diary, and the participant was encouraged to contact the experimenter if they felt distressed during the week.

Stage 4 - Follow up

The following week, these measures were presented to the participant in the order in which they appear below. They were all completed by hand.

- Diary compliance rating
- Cued Recall Memory and Recognition Memory Tests
- The seven-day diary was used to identify the most significant intrusion (please see above for description)
- Intrusion Description Questionnaire.
- Prediction of experimental hypotheses.

The participants were then debriefed and given opportunity to ask any questions they had about the study.

RESULTS

Statistical analysis

These results were mainly analysed using parametric statistics, including paired-samples t-tests and one-way repeated measures analysis of variance (ANOVA). All dependent variables were tested for normality, by examining positive and negative skewness and kurtosis. If the variable was not normally distributed, the variable was transformed. In addition, correlations were used.

Missing data

The results exclude the data for the PDEQ in the control condition for participant 19, as it was not completed by the particpant.

Outliers

The database was examined for outliers, by converting each individual's score in each variable into *z* scores and examining histograms with normal curves for each variable. Real outliers were defined as those which had a z score that were less than or more than three. (i.e. less than or more than three standard deviations from the mean), (Tabachnick & Fidell, 1996, pp.69).

Three outliers were found. The raw score was changed to one unit larger than the next most extreme score in the distribution. All outliers and change scores are reported in appendix 18.

Ratings of task compliance

Attention paid to task

The mean rating for 'how much attention did you pay to the task you were asked to perform during the film' was 6.70 SD (2.29) on a scale of 0-10, where 10 meant total attention. This indicates that participants attended well to the task.

Squares and Pyramids

After the experiment the experimenter rated each participant for task compliance. All participants produced a number of Plasticine shapes during the grounding condition. The number of squares and pyramids produced varied greatly varied between subjects. Range = 8 – 40. Compliance with the task was rated out of 4, participants obtained one point each for: making Plasticine shapes, producing both pyramids and squares, correctly sorting the shapes into the corresponding bucket, and alternating production of each shape. All participants tried to achieve the task set, 18 scored four, and two scored three points. The two participants scoring three had made a different number of pyramids compared with squares. It is likely that this is due to participant error, rather than an unwillingness to comply with the task.

Relevance of the stressful film of car crashes for participants

Relevance of car crashes

Participants' mean relevance rating was 3.75 SD (3.00). This indicates that participants did not find crashes extremely relevant to their lives but did find them to be of some moderate relevance.

No of crashes experienced

The mean number of car crashes the participants had been involved in was 0.55 SD (.89), which may explain the relatively low relevance rating.

Measuring dissociation

As dissociation was the variable of most importance to this study, it was measured in by four subjective self report questionnaires: Using a state dissociation clinical measure (the DSS), a peri-traumatic dissociation measure commonly used for research (the PDEQ) and as a trait (the DES and TDQ). In addition, the modified version of the DES (the DES-T) was used as this is said to most represent pathological dissociation.

Manipulation check

Hypothesis one a) : State dissociation

- It is predicted that participants will dissociate less during condition 1 (grounding task) than during condition 2 (viewing the film without a task) as manipulating Plasticine is hypothesized to reduce dissociation. This will be measured by post-condition DSS and PDEQ scores, with higher scores indicating more dissociation.

The DDS questionnaire total for the pre-video measure score was not normally distributed as it was significantly skewed. The data was transformed by conducting a square-root transformation. This reduced skewness and kurtosis to acceptable significance levels (below 1.96). Before any analysis was performed the grounding and control DDS scores were also transformed in order to make the variances comparable.

A one-way repeated measures ANOVA was then performed in order to ascertain if there were significant differences between state-dissociation at three time points (as

measured by the DSS); before the films were shown, after the grounding condition, and after the control condition. A significant main effect was found: Wilks' Lambda = .61, F (2,17)= 5.45, p = .015.

Looking at the means, it suggests that the only significant difference is between pre-video measures and the measures taken during the video. This was confirmed by t-tests. There was no significant difference between the grounding and control condition: t (18) = -1.5 n.s. (p= .15). However significant differences were found between the pre-video measure of state dissociation and the control film: t (18) = -3.40 p= .003; and pre-video measures and the grounding film: t (18) = -2.78. p= .01.

This means that participants felt significantly more dissociated while watching the stressful videos than they had been before seeing the films.

However, participants in the grounding condition did not feel significantly less dissociated whilst watching the film than those in the control condition. Hence the grounding technique did not have the predicted effect of reducing dissociation.

Table 1. To Show Mean DSS and PDEQ Scores Before the Films Were Shown, During the Grounding Film, and During the No-Task Film

Time	*Mean DSS*	*Standard Deviation DSS*	*Mean PDEQ*	*Standard Deviation PDEQ*
Post Control	7.89	(7.14)	14.28	(4.13)
Post Grounding	6.42	(6.64)	14.32	(3.65)
Pre-video	2.84	(7.14)	-	-

The same result was found using a different self-report measure (PDEQ).

There was no significant difference found in state dissociation between the grounding and control condition as measured by the PDEQ: t (18) = < .0001 n.s. (p= 1.00). Indeed, the scores were almost identical across conditions.

These results show that the viewing of stressful films induces dissociation but that manipulating Plasticine does not reduce levels of self-reported dissociation.

- **Therefore, hypothesis one is not supported**. Participants did not dissociate significantly less during the grounding task than when viewing the film without a task. Participants' scores on the PDEQ and DSS were not significantly higher during the control film.

Control of other variables: attention and memory

Attention paid to film

A paired samples t-test was conducted in order to ascertain whether there was a significant difference between attention paid to the film during the grounding condition and attention paid to the film during the control condition.

There was no significant difference in attention between the two conditions:

t = (19)- 1.52. n.s (p= 0.15).

This means that any differences found between the two conditions cannot be attributed to differential attention being paid to the two films.

Memory tests

Converting the scores

As the videos were of different lengths there was a discrepancy between the number of questions asked for each video, i.e. for the cued recall questionnaire, the video with

three scenes had nine questions assessing recall at one week follow-up, and the video with two scenes contained only six questions to assess the recall at follow-up. In the recognition memory questionnaire, the video with three scenes had 13 questions and the video with only two scenes had seven questions.

Accordingly, all participants total scores were converted into proportions by dividing their score on each questionnaire by the total possible score for that questionnaire. For example: the probability of gaining eight in a questionnaire where the total possible score was 13 would be .62.

This allowed the scores between questionnaires to be compared appropriately.

Cued recall memory

As predicted, no significant difference was found in the number of items answered correctly from the grounding section of the video compared with the control section of the film: t (19)= 1.33. n.s. (p=.20).

Recognition memory

There was no significant difference found between the number of items correctly reported on the recognition memory questionnaire when the participant was under grounding or control: t (19) = .74. n.s. (p=.47).

It can be concluded that the grounding task did not significantly interfere with the ability to explicitly recall the film as compared with having no task during the film. Therefore neither recall nor recognition memory are different across conditions. This means that any differences found between intrusive memories in the films are not simply because the grounding task had the effect of distracting the participants so that they could not encode the film.

Experimental demand question

At follow-up participants were asked to rate how much they thought that manipulating Plasticine while watching the film would decrease or increase their intrusive memories. This was measured on a scale of from -10 to +10 (A score of 0 indicated the induction would neither increase nor decrease their intrusive memories).

The mean rating was - 0.4. SD (3.16) indicating that participants did not believe the grounding technique would have a significant effect on the intrusive memories they reported.

Order of video presentation and condition

Although both the video and the condition order were counterbalanced, it is possible there may have been an interaction between the two; that is, the reported number of intrusions may have been affected by the combination of one of the videos with one of the conditions. For example the effect may have only been found when the grounding condition was presented first. Accordingly, the data was entered into a two way split-plot ANOVA.

One significant main effect was found for the within-subjects factor:

Wilks' Lambda = .71; F (1,16)= 6.43, p =. 022.

This indicates that more intrusive memories were reported from the grounding condition than the control condition.

There were no significant interactions found, (order of video with intrusions: Wilks' Lambda = .84; F (1,16)= 3.04,n.s. (p =. 10); order of condition and intrusions: Wilks' Lambda = .90; F(1,16)=.1.70, n.s. (p =. 21.) order of video and order of task with intrusions Wilks' Lambda = .93; F (1,16)= 1.19, (p =. 29)).

As there were no significant interaction found between the order of task, order of video and the reported number of intrusions, it may be concluded that the order in which participants received the task, and the order in which they received the videos, did not significantly affect the number of intrusive memories they experienced.

Intrusive Memories

All participants completed their intrusions diary for a week. Two participants reported experiencing no intrusions. All participants rated their compliance with completing the diary by answering the following question:

'On a scale of one to 10 how much do you agree with this statement:

I have often been unable (or forgot) to record my unpleasant thoughts or images in the tick diary?' A score of 1 indicated that they noted down every intrusion, a score of 10 that they did not remember to note down any. The overall mean for compliance was 1.75 (SD= 1.37) indicating that participants did record most of the intrusions they experienced.

Intrusion phenomenology

82% of intrusions which were reported in the seven-day diary were of traumatic images. Only one of these intrusions was unable to be identified as belonging to either film (accounting for only 1.2% of total intrusions). The content of the images are reported in the table below. 18% of intrusions were reported as thoughts by participants. These included comments such as: 'danger, inevitability', and 'imagined car crash when I heard the sound of a car'.

Table 2. To Show Intrusions Reported by Participants and the Condition their Most Significant Intrusion was Derived from.

Intrusion description	**No of subjects reporting this intrusion**	**No of subjects reporting this intrusion as their most significant.**	**Condition in which most significant intrusion occurred**
Baby in blanket	1	0	neither
Man being cut out of car	1	0	neither
Man's bleeding knee	7	2	grounding, control
Woman's legs bleeding while carried	2	2	control x 2
Scene on highway dead men with blankets on them	1	0	neither
Dead fat man being put in coffin/dropped in	3	2	grounding, control
Bodies in coffins	3	1	control
Dead man in mangled car, squashed against dashboard	2	1	control
Commentary children left behind	1	0	neither
Girl screaming with tubes	11	10	control x 8 grounding x 2
Dead person covered in blood			Can't attribute to either condition as not enough detail provided

Main experimental hypotheses : Intrusive memories

Table 3. To Show the Total and Mean Number of Intrusions Reported in each Condition

	Intrusions in grounding condition	*Intrusions in No-task condition*	*Unable to identify*	*Intrusions reported as thoughts*
Total	19	48	1	15
Mean	.95 SD (1.09)	2.4 SD (1.9)	.05 (.22)	.75 SD(1.89)

Hypothesis Two: State dissociation and intrusive memories

The dependent variable of total number of intrusions for the grounding condition was significantly skewed, so the variable was transformed using a square root transformation. The transformation successfully produced a variable that was normally distributed, so the control variable was also transformed. The two variables were then analysed using a parametric paired samples t-test. There was a significant difference reported in the number of intrusions reported from the film in which the grounding task was performed as compared to the control film: $t(19) = -2.3$. $p = 0.03$. In addition, the number of days upon which intrusions were experienced to the film in which no task was performed was significantly greater than the number of days with intrusions from the film in which the grounding task was performed: $t(19) = -2.18$. $p = 0.049$.

- **Therefore, hypothesis two was supported.** Intrusive memories of the film experienced during the following week, which were identified as belonging to the grounding condition, were of a significantly lower frequency than those in the control condition. Additionally, participants experienced a significantly greater number of days with intrusions from the control condition.

Hypothesis three: Trait dissociation and intrusive memories

According to Murray (1997) the TDQ purports to measure a similar construct to the DES. As this measure has not been extensively validated, it was correlated with the DES. A significant correlation was found between the scores on the DES and TDQ:

Pearson's correlation r = .610. p=0.04. This means the measures are measuring a similar but not identical construct.

Scores on the DES were found to not significantly correlate with the overall total number of intrusions reported for each participant across both conditions.

Pearson's correlation r = -.19 n.s. (p= 0.40)

In addition, individuals scores on the TDQ were not found to correlate significantly with their total reported intrusions across both conditions.

Pearson's correlation r = -.024 n.s. (p= 0.92)

These results indicate that trait dissociation as measured by the TDQ and DES does not significantly predict later intrusive memories.

The DES-T

The last dissociation measure used was the modified version of the DES, the DES-T as this is said to most represent pathological dissociation.

Scores on the DES-T were found not to correlate with the overall total number of intrusions reported for each participant across both conditions: Pearson's correlation r = . -.19 n.s. (p= 0.40).

These findings suggest that trait dissociation, whether deemed pathological or not, does not predict later intrusive memories.

- **Hypothesis three is partially supported,** as higher trait dissociation as measured by the DES does not lead to a greater incidence of intrusive memories. Participants with a greater score on the DES do not have a greater number of intrusions overall. However, a higher score on the pathological

form of trait-dissociation (the DES-T) does not lead to a greater incidence of intrusive memories.

Hypotheses four and five: mood and distress

The following results are concerned with how participants responded to both films emotionally.

Hypothesis Four: Mood

All participants were asked how much they felt 10 different mood states on a scale of 1-10 where, 1 indicated they did not feel that mood at all and 10 indicated an extreme level of that mood.

Table 4. To Show the Means of Mood Ratings Pre-film and after the Induction and Control Conditions.

Measure Mood rating	**Pre-Film Rating Mean (SD)**	**Grounding condition (post-film rating) Mean (SD)**	**Control condition (post-film rating) Mean (SD)**
Happiness rating	5.15 (2.01)	2.8 (2.04)	3.45 (2.16)
Anxiety rating	3.70 (2.75)	3.00 (2.49)	3.00 (2.53)
Depression rating	2.30 (2.03)	2.55 (2.41)	3.05 (2.41)
Anger rating	.95 (1.67)	1.35 (1.63)	1.55 (2.28)
Fear rating	1.1 (1.51)	2.15 (2.34)	2.60(2.64)
Horror rating	.40 (.94)	2.45 (2.25)	2.60 (2.50)
Helplessness rating	1.05 (1.70)	2.00 (2.61)	1.75 (2.05)
Disgust rating	.40 (.88)	2.55 (2.76)	2.7 (2.9)
Ashamed rating	.60 (1.19)	.70 (1.30)	1.05 (1.27)
Guilt rating	.55 (1.43)	.80 (1.36)	1.2 (1.93)
Total negative mood	16.0 (10.60)	25.2 (16.8)	25.8 (14.5)

The total negative mood score across each condition was calculated by summing the above nine variables and adding the inverse score for happiness. The reliability

coeffient alpha indicated that it was appropriate to sum these individual scores: coefficient alpha = .82. The coefficient was also comparable for the grounding: $\alpha = .91$, and control conditions: $\alpha = .85$

The questionnaire total for the pre-video mood measure score was not normally distributed so it was transformed using a square-root transformation as for the DDS variable. The transformation was successful and the data were now an acceptable normal distribution so parametric tests could be used.

A one-way repeated measures ANOVA was performed. Wilks' Lambda = .62, $F(2,18)=.5.06$, p =. 013 . This revealed significant differences between the three conditions. In order to ascertain whether the differences between the conditions were as predicted, three t-tests were performed.

There were significant differences found between mood states before the films were shown and after the grounding condition; t = (19)- 3.55, p= .002.and before the films were shown and after the control condition. t = (19)- 2.77, p= .012. No significant difference was found between the control and grounding condition. This means that contrary to predictions the significant difference only lay between the pre-video measures and the post video measures, and not between the control and grounding conditions.

In order to test the hypothesis that both depression and fear would be lower in the control condition, than the grounding condition. Two t-tests were performed. Neither was significant: t = (19)- 1.39, n.s.(p= .18); t = (19)- 1.01, n.s.(p= .32).

This means that feelings of depression and fear were not significantly lower for the control condition.

- **Hypothesis four a) was not supported.** There were no differences found in the mood measures between the film in which the participants manipulated the Plasticine and the film which they watched with no task. There was, however, a significant increase in total negative mood found from the pre-video scores to watching either of the films. **Hypothesis four b) was not supported,** depression and fearfulness were not significantly lower during the control condition than during the grounding condition.

Hypothesis five: distress

Participants rated their distress whilst viewing the videos out of ten, the mean distress score was 4.5 SD (2.29) in the grounding condition and 4.85 SD (2.45) in the control condition.

Viewing the film while grounded did not result in less distress than viewing the film normally: t = (19) 9.6 n.s. (p= .35)

- **Hypothesis five was not supported.** Participants did not obtain higher distress ratings during the film in which they performed the grounding task than in the control.

DISCUSSION OF EACH HYPOTHESIS

Overview

This section explores the results of study one in detail, by revisiting each hypothesis. It explains the specific implications of each finding, including limitations of the findings, and discusses the results in relation to existing research.

A more general discussion detailing the links between the two studies is contained in the final chapter, and contains a broader consideration of the clinical implications whilst giving suggestions for further research.

All hypotheses are presented in the same order as the preceding results section. The main findings are briefly summarised below with the intention of giving an overview of the results.

- The peri-traumatic visuo-spatial grounding task resulted in fewer intrusive memories over the following week.

- The viewing of the stressful films led to increased levels of state dissociation. However, the visuo-spatial task of manipulating Plasticine did not reduce spontaneously occuring dissociation.

Task compliance

Participants rated themselves as attending to the visuo-spatial task, averaging seven out on ten on a self-report measure of attention. In addition, the majority of participants received an experimenter rating of four out of four task compliance, with only two scoring three and all participants creating at least eight shapes. The visuo-spatial task was designed to be of a similar difficulty level as the MOAR box used in Holmes' (2000) study. In her study, participants had to hold a sequence of letters and their relevant positions in working memory and tap out the sequence of letters onto a box they could not see. In the current study participants had to maintain a represention of the shape they were trying to create in their working memory and then create it without any visual feedback. They then had to sort the shape into the correct bucket. This task is not an easy one and it is likely the differences in number of shapes made by two participants was due to participant error rather than a deliberate attempt to not complete the task effectively.

Therefore, we can conclude that participants did complete the task they were asked to during the experiment.

Manipulation check: State dissociation

- Hypothesis one was not supported. Participants did not dissociate significantly less during the grounding task than while viewing the film without a task. Participants' scores on the PDEQ and DSS were not significantly higher during the control film.

This study clearly demonstrates that state dissociation increases when clients have just watched a stressful video of road traffic accidents, but does not support the hypothesis that a visuo-spatial grounding task leads to a reduction in dissociation.

In explaining this finding, we must consider possible floor effects. It is possible that when the participants were viewing the stressful film they were dissociating at the lowest level they could in the situation they were in. If this floor effect existed then no differences would have been found between the two conditions, as participants could not have reduced their dissociation further, by manipulating a piece of Plasticine. In this study the mean DSS score for the control condition was only 7.8 whereas in Holmes' (2000) control condition it was 16.

An important difference between my sample and Holmes' is that participants in her study had been pre-screened for their ability to dissociate. It may well be that the screening primed the participants to dissociate in some way when they were exposed to stimuli which they found particularly distressing,or that there was some consistent variable across her sample that naturally made them more likely to dissociate in response to traumatic events. If participants dissociate more extremely in all the conditions, one would be able to test whether dissociation was lowered in the visuo-spatial condition. Holmes' study, then, did not appear to suffer from a floor effect, but she also found that a visuo-spatial task did not lead to decreased dissociation.

Two studies have now found that a visuo-spatial task does not lead to decreased dissociation. Holmes pioneered this research but only studied the effects in a between-subjects design, which means there may have subtle differences between the groups that may have accounted for the null finding. This study, however, has used a within-subjects design and hence greatly reduced variance between conditions.

As this replication used an improved design, it suggests that we should look for alternative explanations as to why visuo-spatial tasks decrease intrusive memories, rather than dissociation.

Memory and attention: controlling for other variables

- There were no significant differences found between attention paid to the film in which the grounding task is performed and the control film. In addition, there were no significant differences found between scores on the recognition and recall memory tests across both conditions.

Both this study's finding, and Holmes' (2000), results could be criticised by arguing that the visuo-spatial tasks used are simply distracting, in that participants do not attend to the film in which they perform the task as well as to the control film. The fact that no significant differences were found on the attention measure belies this, but one could argue that participants were simply giving a high score in order to please the experimenter, as they were told so explicitly to attend to the film at all times and not to look away. Another argument in support of the task not simply distracting the participants is that there were no significant differences found between the explicit memory or recall and recognition memory measures. However, it is possible that the measures are not sensitive enough to pick up on subtle differences in memory performance.

The strongest argument against the visuo-spatial task merely acting as a distracter is that provided by Hennessey (2002).Using a similar experimental paradigm, he has discovered that participants who are given a verbal distracting task while they watch the stressful video, actually have **more** intrusive memories of the video. This suggests

that it cannot just be the fact that the task is distracting for the participants that led to them having fewer intrusions, as a verbal distracter has the opposite effect. This neatly ties in with the proposition made by Brewin et al. (1996), that there are at least two memory systems of importance in the encoding of traumatic memories. In this paradigm, the verbal distracter would compete for verbal resources within the VAM system, making it less likely that memories would be encoded within the VAM system and more likely that they would be encoded within the SAM system. This would then make it more likely that memories would be experienced intrusively.

Intrusive memories

- Hypothesis two was supported. Intrusive memories of the film experienced during the following week which were identified as belonging to the grounding condition were of a significantly lower frequency than those in the control condition. Additionally, participants experienced a significantly greater number of days with intrusions from the control condition.

This finding supports the predictions made by Dual-representation Theory, i.e. performing a visuo-spatial task during the stressful film will reduce the overall number of intrusive memories experienced and number of days in which they are experienced for. It also replicates Holmes' (2000) finding that use of a visuo-spatial task helps to reduce later intrusive memories, and extends this research by demonstrating that another visuo-spatial task will produce a similar result. This task is one that is often thought to be beneficial therapeutically.

Dual-representation Theory predicts that the visuo-spatial task would compete for visuo-spatial resources within the SAM system. This means that memory will be less

likely to be encoded within the SAM system. Any memory laid down in the SAM system, is more likely to be sensory, fragmented and easily triggered into intrusions. Whilst performing a visuo-spatial task one is still able to encode memories in the VAM system which is more like ordinary autobiographical memory and less likely to trigger intrusions. As participants are more likely to have encoded memories in the VAM system than the SAM system because the encoding has been restricted by the grounding task, they are less likely to experience intrusions.

It was postulated that dissociation helps to facilitate this process but in my random sample of students, this has not been found.

Trait dissociation

- Hypothesis three is partially supported, as higher trait dissociation as measured by the DES and TDQ does not lead to a greater incidence of intrusive memories. Participants with a greater score on the DES do not have a greater number of intrusions over all. However, a higher score on the pathological form of trait-dissociation (the DES-T) does not lead to a greater incidence of intrusive memories as predicted.

This is the first replication of the result obtained by Holmes' (2000) using a similar experimental paradigm. She discovered that trait dissociation as measured by the TDQ did not predict later intrusive memories. My study also used the more extensively validated DES to measure trait dissociation. Holmes noted that trait dissociation is known to be higher in a younger population, and both her sample and mine utilised a student population (Ross, Joshi & Curries, 1990). With higher levels of trait dissociation present, according to the clinical literature, more intrusive

memories should occur. However, it is not suggested that younger people are more likely to have experienced trauma, and it is likely that younger people actually display high levels of non-pathological dissociation as distinguished by Putnam and Waller (1996). Making this distinction would mean the finding that trait dissociation does not lead to an increase in intrusive memories need not contradict the clinical belief that higher levels of dissociation during trauma lead to later difficulties, as it would be *pathological* dissociation which would lead to later psychological difficulties. Accordingly, I also measured the pathological form of dissociation using the DES-T, but found that higher scores on the DES-T still did not predict later intrusive memories. It could again be argued that the failure of the DES-T to predict intrusive memories was a result of participants in a laboratory not being the same as those who have experienced an unpredictable and overwhelming trauma. However, Holmes demonstrated that the phenomenology of intrusive memories in the laboratory was similar to those experienced by clients with PTSD as reported by Ehlers & Steil (1995) and Ehlers and Hackmann (1998). The intrusive memories reported in Holmes' study were reported to be sensory and fragmented. They were also more likely to be within the visual modality, and rated as 'snap-shots' or 'film-sequences'. The intrusive memories reported in this study were also more likely to be from the visual modality.

This result suggests that we should consider the possibility that there may not be a causal link between high levels of trait dissociation and experiencing intrusive memories after a stressful event. Recently, Merckelbach and Muris (2001) produced a critical review of the literature which casts into doubt a causal link between self-reported trauma and dissociation. They note that correlations between dissociative symptoms and traumatic experiences are 'at best, modest'. A meta-analyis of child-

abuse studies conducted by Rind, Tromovitch and Bauserman (1998) support the assertion that there is only a modest association between sexual abuse and self-reported dissociation.

Merckelbach and Muris (2001) suggest, as Frankel (1996) had before them, that the view that there is a direct casual link between trauma and dissociation is only attractive because of its parsimony. They suggest that, in their search for parsimony, researchers may be missing third variables which are implicated in the relationship between dissociative tendencies and trauma. Studies often focus upon dissociation and those who have experienced child abuse, but Merckelbach and Muris suggest that it could be that those who have been abused as children and have symptoms of dissociation may simply be more likely to enter treatment programmes than those who dissociate but do not have a history of abuse. Researchers have also noted that the relationship between trauma and dissociation disappears when other factors such as measures of family pathology are entered as covariates in analysis (Nash, Hulsey, Sexton, Harralson & Lambert 1993).

Studies which cite evidence that trauma causes dissociation usually rely on DES scores, but it has been suggested that individuals who score highly on the DES display some form of positive response bias on self-report measures, i.e. that they are also more likely to positively endorse self-report indices of trauma. Merckelbach and Muris propose this may be because DES scores overlap with personality features such as fantasy proneness.

Merkelbach has tested this hypothesis in two experimental studies by exposing undergraduates to items which were presented as paragraphs or photographs.

He then presented them with a recognition task and asked them to say whether they had seen a particular item before. He found that fantasy proneness and DES scores

were significantly correlated with false positive errors, that is, reporting they had seen an item when they had neither seen, nor read about it before. When the fantasy proneness items were partialled out the correlation between false positive responses and DES scores attenuated.

Of course, this finding in itself does not mean that trait dissociation is not causally linked with trauma but does mean that the questionnaire we have been using to measure it cannot reliably answer the question for us. In combination with the other evidence presented in his paper and the results of both this study and Holmes study a sizeable body of evidence is building to suggest the two may not be causally linked. These studies are important as they are subject to much tighter controls than many of the clinical studies, and they do not suffer from the confounding variables found in the literature. The use of alternative questionnaires, including the TDQ, is considered in the discussion of the second study.

Mood and distress

- Hypothesis four a) was not supported. Participants did not report significantly less depression or fearfulness during the control film.
- Hypothesis four b) was also not supported as participants did not experience more peri-traumatic emotional numbing while watching the film in which they performed the grounding task than when they watched the film in which they performed no task.
- Hypothesis five was not supported. Participants did not obtain higher distress ratings during the film in which they performed the grounding task than in the control.

Depression, fearfulness and distress were not found to be affected by condition. It must be noted that the manipulation of dissociation was unsuccessful in this study. The relationship between these emotions and dissociation will be discussed further in the following study as it is likely these emotions were not affected because the dissociation manipulation was ineffective.

Peri-traumatic emotional numbing was measured by a composite score of rating across ten moods. There were no significant differences found for the film in which the participants manipulated the Plasticine and the film which they watched with no task. There was, however, a significant increase in total negative mood found from the pre-video scores to those recorded after watching either of the films, indicating that participants did respond emotionally to the viewing of a stressful film.

This means that the reduction in intrusions reported from the film in which the visuo-spatial task was performed cannot be directly attributable to mood fluctuations across the films. It also means that emotional numbing, as defined as a reduction in experienced emotion, did not occur in either of the conditions.

A possible methodological flaw?

When the participants were asked to create the Plasticine shapes they were informed that the reason for making them was that people often find it reassuring to be manipulating an object when they are feeling stressed. This suggestion was given to participants in order to remain as close as possible to clinical practice as clients are informed that grounding objects will help them. However, this suggestion did not lead to a decrease in dissociation for the participants. It could be argued that this suggestion contributed to their decrease in intrusive memories. Yet, if this suggestion had affected the participants, an emotional effect should have observed but no

significant differences were found across groups. It seems unlikely that the suggestion could have affected later intrusive memories without the participant responding emotionally at the time.

Summary

In this study an attempt was made to decrease dissociation and emotional numbing in a normal sample of the population, through use of a Plasticine manipulation. By decreasing these variables, it was predicted that participants would experience fewer intrusive memories over the following week. The dissociation manipulation was unsuccessful and participants' mood was not significantly different across both conditions. However, participants did experience fewer intrusive memories from the film shown in the grounding condition than the film shown in the control condition. It is possible that dissociation was not decreased in this study because of a floor effect, although it is also possible that manipulating Plasticine does not lead to reduced dissociation. The decrease in intrusive memories for the grounding condition can be understood through recourse to Dual-representation Theory (Brewin et al., 1996). This theory predicts that performing a visuo-spatial task such as manipulating Plasticine during a stressful event would lead to fewer intrusive memories occurring than when performing no task. Lastly, as previously found by Holmes (2000) trait dissociation did not predict later intrusive memories. This provides more evidence to support the theory that trait dissociation as measured by the DES is not a significant predictor of later re-experiencing of trauma.

CHAPTER THREE

INCREASING DISSOCIATION THROUGH HYPNOSIS

(STUDY TWO)

INTRODUCTION

(STUDY TWO)

How can we increase dissociation using hypnotic suggestions?

What is a hypnotic Suggestion?

Hypnosis itself has been described as a 'natural psycho-physiological state of aroused, attentive and receptive focal concentration with a corresponding relative suspension of peripheral awareness' (Spiegel & Spiegel, 1987). Or more simply, as a 'state of mind characterised by relaxation and a state of hyper-suggestibility' (Yarnell, 2001). While in a hypnotic state, a person will be more receptive to suggestions a hypnotist makes. Hypnosis itself will not result in a change in behaviour unless a suggestion is given. In addition, the participant will not experience a behaviour which has been suggested while under hypnosis, as something that is actively achieved. It is, instead, perceived as effortless; for example, a participant who has been hypnotically instructed to feel no pain, may say things like: 'Suddenly, I found myself feeling no pain'. People have been hypnotised in the past to feel a plethora of experiences, including memory loss and auditory and visual hallucinations (Nash, 2001). This makes it reasonable to suppose that we can suggest a form of dissociative experience whilst the participant is hypnotised and that it is likely to feel real to the participant.

Hypnosis and dissociation

We have already learned that the relationship between dissociation and hypnosis has been confused since Janet's time. As Kihlstrom (1994) points out, 'dissociation' can be a descriptive term, referring to a state in which certain mental contents or processes are barred from consciousness, or simply referring to a lack or integration or

association between ideas. It can however, also describe the hypothetical process by which the barring is achieved. This is why it has been suggested that hypnosis is a controlled form of dissociation (Spiegel & Cardena, 1990). It should be noted that dissociation, as used in the field of hypnosis, is a very different concept to that described in the previous chapter. There are currently two major opposing theories which describe how hypnosis works (Sapp & Evanow, 1998). The dissociation theories (Hilgard, 1994; Woody & Bowers, 1994) state that hypnosis is an involuntary process and an altered state of consciousness.

Hilgard's proposal (1994) was a neodissociation theory of hypnosis in which clients' ideations become separated. He states that cognitive subsystems which are arranged in a hierarchical order can become separated from the executive ego, and processing can occur in an unconscious fashion, that is, outside of one's level of awareness. However, information can also be available upon another level (conscious). An amnesic barrier between dissociated subsystems explains why hypnosis is experienced as involuntary.

Woody and Bowers (1994) question this division of executive ego in conscious and unconscious parts which are separated by an amnesic barrier, stating that hypnosis weakens executive control over subsystems. They view hypnosis to occur as a result of frontal brain lobe dysfunction or inhibition. Both these models of dissociation could be viewed as the compartmentalisation described in the first chapter (Holmes et al., 2002).

The second group of theories are sociocognitive (e.g. Spanos, 1986) and question the view that clients' experiences during hypnosis are the result of an altered state of consciousness. Here, hypnosis is viewed to be a product of social influences and cognitive-behavioural strategies used by clients.

Researchers have argued that hypnosis cannot be a form of dissociation as an orthogonal relationship exists between dissociative tendencies and hypnotic susceptibility (Michelson & Ray, 1996). Typically, correlations of the Harvard Group Scale of Hypnotic Susceptibility (HGSHS) with the Dissociative Experiences Scale are low ($r = .09$). This kind of research underscores the confusion surrounding dissociation. The DES is a clinical measure of dissociation, and would not necessarily be expected to predict hypnotisability, hence this is no way contradicts the dissociation theories of hypnosis. Indeed, researchers have found that absorption and dissociation *are* correlates of hypnotisability when they occur within the hypnotic context (Pekala, 1991).

It is unclear which of the major theories most accurately describes clinical findings, and it seems likely that both are in part correct. Dissociation itself is perhaps not the most helpful term to use given the confusion about what dissociation is, but at least Hilgard has tried to underscore that his interpretation of the concept is particular by terming his theory *neo*-dissociation. Wherever the precise truth lies, it is reasonable to suppose that a dissociative experience could be induced using a hypnotic suggestion. Even if the participants are being influenced by their own cognitive-behavioural strategies, as long as they believe in the reality of the experience, they can effectively experience the dissociative phenomena. Recently, a number of researchers have tried to use hypnosis to increase some form of dissociation (as described below). It is important to note that they are trying to *induce* dissociation through hypnotic suggestion per se, not merely suggesting that participants are dissociating by virtue of being in a hypnotic state.

Using hypnosis to increase dissociation – previous research

In 1994, Van Quekelberghe, Gobel and Hertweck developed a questionnaire to assess unusual kinds of conscious experiences which they called Assessment Schedule for Altered States of Consciousness (ASASC), in order to examine near-death and out-of-body experiences. As part of this process they asked 21 undergraduates who were all novices in hypnosis, to simulate these experiences under hypnosis. They reported that participants were able to achieve a variety of impressive, novel experiences. While they were not focusing upon clinical dissociation itself, this research suggests that hypnosis is a reasonable way to aid participants to experience unusual experiences.

In 1999, Heidi Sivers sought to create a practical laboratory analogue of dissociative states at Stanford (unpublished research, personal communication). Twenty hypnotisable undergraduates at Stanford were hypnotised then instructed to be in a normal or dissociated state of mind. The dissociative suggestions included; 'you feel detached from the situation both physically and emotionally' and 'you feel as if you are watching what is going on in a dream'. Events which were analogous to an assault were presented by moving or touching the participant's body (e.g. pinching an ear); they received 12 such events while in each state. Participants were later asked to recall the events whilst in a normal and a dissociated state. The results showed that, in the normal state, fewer items received in the dissociated state were recalled, but whilst in the dissociated state, equal numbers of normal and dissociated events were recalled. Sivers concluded that hypnotic suggestions may provide a useful procedure for ethically studying the effects of peri-traumatic dissociation upon memory. As this research is unpublished, it is not possible to ascertain if there were methodological flaws.

Bryant has conducted two studies designed to increase participants' emotional numbing through hypnosis (Bryant & Kourch, 2001; Bryant & Mallard 2002). His first study was with Kourch, and his second a replication with Mallard. In this replication, 20 hypnotised participants were compared with 20 participants who were simulating the suggestion in order to ensure any results found in the hypnotised group were not simply due to demand characteristics. He asked participants to observe emotionally distressing and neutral images while hypnotised to be numb, or to simply simulate the hypnosis. The hypnotic suggestions included that they would be unable to experience emotions that they would normally experience and that they would feel emotionally numb.

The researchers found that both the self-report of felt emotions and the facial expressions of hypnotised participants were inhibited, suggesting that not only did the induction work but that emotional experience and expression were associated.

What kind of hypnotic suggestion should we use to induce dissociation?

Waller, Putnam and Carlson, (1996) tried to unpick which items on the DES were the most commonly experienced dissociative phenomena in clinical and non-clinical samples, in order to determine which forms of dissociation were most 'pathological'. They found that 'acting differently in different situations' was the item on the DES which was most commonly endorsed by clients with PTSD. This was followed by 'other people or objects are not real'. The third most commonly endorsed item was 'Standing next to themselves'. The first of these items is too difficult to mimic in the laboratory. However, the following two items are appropriate to attempt to mimic during hypnosis. It was decided to attempt to get participants to dissociate through using the suggestion that they are outside of their body, and that other people or

objects seem strange or unreal. This was chosen as a desirable suggestion to make experimentally in order to remain as close as possible to the clinical findings. It may also have broader application than PTSD, as depersonalisation is the third most common symptom in clinical samples, exceeded only by depression and anxiety (Steinberg, 1995).

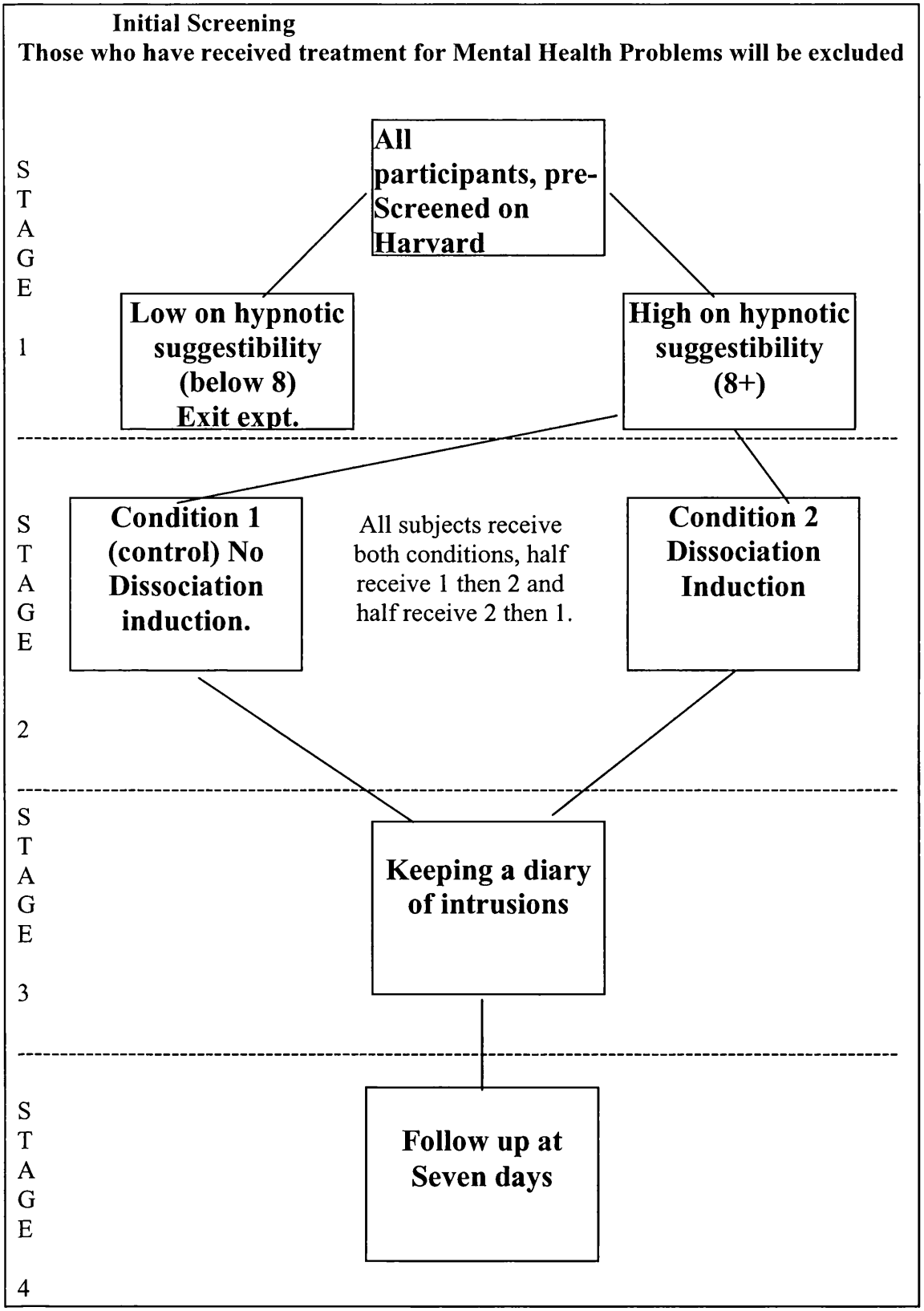
The experiment

In order to ensure that the dissociation occurs during a stressful time, participants will be asked to watch the stressful road traffic accidents films used in the previous study, one film while hypnotised to dissociate, and the other while instructed to view the film normally. Participants will be hypnotised during both films, but only one will have an active hypnotic suggestion. They will then record their intrusive memories for the following week. If the manipulation is successful it is postulated that participants will experience more intrusive memories from the film which they watched while dissociated. This is in agreement with Dual-representation Theory which makes the prediction that hindering information in a traumatic event from entering the VAM system, by dissociation, should interfere with the creation of detailed verbally accessible representations and hence lead to the preponderance of later intrusive memories. Such an experiment has never been attempted before using this paradigm and if successful, will provide us with a new way of studying intrusive memories in a laboratory setting.

Summary of introduction

Previous research suggests that the best way to attempt to increase dissociation is to use a hypnotic induction task to increase the probability of dissociation occurring. The relationship between hypnosis and dissociation is confusing, as dissociation has been used as a term to describe the hypothetical compartmentalisation experienced in hypnosis. In addition, it has been found that psychiatric clients have higher hypnotisability scores; this has been postulated to be because they have experienced more traumatic events. Hypothetically this may be because they have learnt their own form of self-hypnosis, which can be dissociative as they separate one form of knowledge from another in their minds. As this is potentially a very confusing topic, I have specified which aspects of dissociation I am trying to evoke. In this study, participants will try to feel as if they are disconnected from their body for a brief period of time, as if they were someone else and as if the world around them is strange and unreal. These suggestions are intended to emulate experiences most commonly found in PTSD.

Pictorial overview of the experiment



SPECFIC HYPOTHESES AND MANIPULATION CHECKS

As for the previous study, the hypotheses that have been developed from the literature presented in this chapter and chapter one are summarised below for clarity.

Experimental manipulation check

Hypothesis one a)

- Those participants who reported the induction to have been most successful will obtain higher scores on the state dissociation measures.

Hypothesis one b)

- Those participants with a higher trait dissociation score will rate the induction as more successful because they will not find the instructions so unusual as they are more used to dissociative experiences.

Controlling for other variables

Attention

- Attention ratings will be taken for both films to ensure that any differences found in dependent variables are not simply due to the attention paid to the film in each condition.

Memory tests

- Recognition and recall memory measures will also be taken to ensure the hypnosis suggestion does not simply act as a distracter whilst the participants watch the film. This will ensure any differences found in later intrusive memories across conditions are not simply due to the participants failing to encode the film.

First main experimental hypothesis: State dissociation

Hypothesis two

- It is predicted that participants will dissociate less during the video in which they are asked to view normally than during the video in which they are asked to dissociate hypnotically. This will be measured by self-report state dissociation questionnaires.

Second main experimental hypotheses: Intrusive memories

Hypothesis three: State dissociation

- Peri-traumatic dissociation is predicted to increase intrusive memories of the film. Intrusions which are identified as deriving from the section of the film in which the hypnosis induction was performed will be of a higher frequency than those reported from the control film. This will be measured by a greater total number of intrusions in one week and more days with intrusions.

Hypothesis four: trait dissociation

- Trait dissociation is predicted to lead to greater incidence of intrusive memories. Hence, participants with a greater score on the trait dissociation measures will have a greater number of intrusions overall.
- The pathological form of trait dissociation as measured by the DES-T is predicted to lead to a greater incidence of intrusive memories.

Hypotheses five and six: emotional numbing

Hypothesis five: mood

- During the film in which the participants receive the hypnotic induction to dissociate, participants will experience more peri-traumatic emotional numbing than during the film which they are instructed to view normally.

Therefore, overall post-film negative mood ratings will be lower in the hypnotic condition.

- In particular, participants will obtain higher depression and fear ratings in the hypnotic condition than in the control condition.

Hypothesis six: distress

- During the control film, participants will obtain higher distress ratings than during the hypnotic induction film.

METHODS

Design

This study also used a within-subjects design with two conditions counterbalanced for time of dissociation induction.

Piloting Stage

Rationale for Piloting

The pilot was performed in order to establish whether participants would be able to perform the induction required. It was essential to conduct this stage since, to the experimenter's knowledge no-one had had previously tried to evoke these aspects of dissociation using hypnosis. It was anticipated that eligible participants would have to be taken through an initial screening to establish if they could achieve the dissociative state able to step outside themselves in this way. It was possible that only a few participants would be able to achieve this prior to completing the entire experiment. Three highly hypnotisable students volunteered to participate in the piloting stage.

Piloting procedure

The experimenter and Dr. Oakley, a clinical psychologist who is director of the clinical hypnosis unit at University College London (U.C.L) and has been practising hypnosis for over twenty years, devised a draft induction script which was intended to emulate those aspects of dissociation chosen for this study. Dr Oakley then used the induction script (described in detail in appendix 12), to see if the participants were able to imagine themselves outside of their body, perceive the world around them as strange and real, and feel as if they were someone else. The experimenter observed their reactions and questioned them about the experience afterwards.

In order to ascertain whether it was even possible to produce a strong enough effect using hypnosis, the first participant was asked simply to perform the dissociation induction to a target picture.

Pilot results and amendments to design

Pilot participant one reported that it was difficult to step outside himself, as the wall was in the way and he felt hemmed in. With such a literal interpretation of the instructions, it was deemed necessary to move the chair in which the participants sat so that they had enough space around them to 'move' to where they wished. As the first participant was able to step outside himself relatively easily, and experience the world as strange and unreal, the second and third participants were asked to dissociate in this way while watching the traumatic videos.

Pilot participant two reported she had a strong sense of the world being strange and unreal, but that it was hard to remain outside herself for a long period of time and that she kept slipping back into her body.

It was extremely difficult to decide what to do about this problem. We could have tried to compensate for this by incorporating a suggestion that such feelings may occur but that participants were not to worry and should try and step outside themselves again. However, it was felt that in giving such a suggestion we could inadvertently encourage participants to expect that they would keep returning to their body, and hence increase the likelihood of this occurring. It was decided not to suggest anything, so that participants would experience the dissociation as they naturally interpreted the instructions. This should increase the probability of a dissociative state occurring which they would be more likely to experience spontaneously when they were stressed.

Pilot participant three reported that it was not as hard as he had imagined to step outside himself, and he achieved it relatively easily. He described exactly where he stood in the room, and indicated that the sensation was extremely unusual and that the world around him felt strange.

The pilot participants, then, were able to experience the sensations suggested to them, so it was decided to design a larger study. As participants all achieved dissociative states the first time they attempted them, it was deemed unnecessary for all participants to undergo a pre-screening.

Participants

Members of the Clinical Hypnosis Unit at UCL had previously categorised the college's undergraduate students of psychology and pre-clinical medical students according to how hypnotisable they were using the Harvard Group Scale of Hypnotic Susceptibility (HGSHS) (Shor & Orne, 1962) (see measures section for description and appendix 11 for the full scale). Those students high on hypnotic susceptibility were invited to take part in this study, by notes being left for them in their college pigeonholes, and e-mailing them. They were asked to respond to my e-mail even if they did not want to participate, so that I knew that they had received it. If they did not respond another letter was left in their college pigeon holes. Fifty-three psychology students and 20 pre-clinical medical students were contacted; 17 students agreed to participate in the study. Nine were undergraduate psychology students and eight were pre-clinical medical students. Their age range was between 19-21yrs. Of these students, 12 were male and five were female. All participants received five pound for taking part in the study and ethical approval was gained from the University

College London Hospitals NHS trust ethics committee (this letter is included as appendix 16).

Apparatus

(See study one, pg 37).

Measures – (Copies can be found in appendices 11-14)

- The measures were the same as those used in the previous study with the addition of :
- Harvard Group Scale of Hypnotic Susceptibility. Form A

(Shor & Orne, 1962). This is an adaptation of the original Stanford Hypnotic Susceptibility Scale (Weitzenhoffer & Hilguard, 1959). It allows group administration and self-report scoring. It is a complete set of instructions for 12 standard hypnotic induction procedures, which are then measured on a 12 point scale. It assesses how susceptible participants are to hypnosis by giving a rating of the success of each of the 12 inductions. Those who score eight or above are considered to be highly hypnotisable.

- 6 Visual Analogue questions to measure the efficacy of the induction.

Participants were asked to indicate how strongly they felt the experiences of observing themselves looking at the film, how strongly they experienced the world as if it were happening to someone else, and how much they felt as though the world around them was strange and unreal. They rated it twice, once for when they were told to watch the film as they normally would, and once when instructed to feel differently. They marked a 100mm line with a vertical pencil mark from 0 (not getting the feeling at all) to 100 (the feeling was very strong indeed).

- An open question.

Participants were asked to explain how they felt when they were asked to experience the film differently. This was in order for them to have an opportunity to share their experience without being influenced by my questioning and for us to develop our understanding of what is happening during the induction.

Procedure

Stage 1 – prior to the experiment

Participants were allocated to condition one or two prior to meeting the experimenter; those in condition one received the dissociation induction followed by the control condition, (BA) those in condition two received the control condition followed by the dissociation induction (AB). The order was counter-balanced in the same way as the previous study.

Stage 2- prior to the hypnotic induction.

This experiment was conducted in a room in The Clinical Hypnosis Unit at UCL.

1. All participants read the participant information sheet and were given an opportunity to ask questions.
2. The informed consent form was signed by both experimenter and participant.
3. Participants completed the subject demographic questionnaire, which included information on ethnicity, age, gender and degree studied (including the name of their personal tutor) and number of years of education.
4. A number of questionnaires were then completed:

- The Dissociative Experiences Scale (DES)
- The Trait Dissociation Questionnaire (TDQ).
- Dissociative State Subscale (DSS).
- Mood Ratings.

Stage 3- the induction.

1. The experimenter then introduced the participant to Dr. David Oakley. The participants sat in a chair approximately 1m from the television screen. David Oakley sat to their right and the experimenter sat to their far left, out of their line of sight.
2. Dr. Oakley took the subjects through a screening, to see what kind of hypnotic induction they may have used previously (if any), in order to personalise the induction to the individual and create a unique special place for the individual. (see appendix 12 for an example of a special place) (Degun-Mather, Walters & Oakley, 2000).
3. Dr. Oakley then used a standard induction script to hypnotise the participant. Firstly participants 'visited' their special place to help them enter a hypnotic state, and once participants were ready to leave there, Dr. Oakley began to use the hypnotic induction developed specifically for this study. Participants in condition one received dissociation instructions followed by the no task control instructions, in condition two, they received the no task control instructions followed by the dissociation instructions. The full hypnotic script is shown in appendix 12.
4. After the instructions had been given, Dr Oakley asked the participants to open their eyes and watch the film, then the first video was shown.
5. When the video ended, the participant shut their eyes and Dr. Oakley led them back to their special place. After a few minutes there, the experiment continued.

6. Dr. Oakley then gave the no task instructions or the dissociation instructions, depending on which had been given previously. He then asked the participant to open their eyes again and view the second film.
7. At the end of the film, Dr. Oakley used a standard induction procedure to remove the hypnotic suggestions.
8. Dr. Oakley then ensured the participants were fully awake before the final questionnaires were administered.

It is important to note that the participant was hypnotised throughout both videos; the manipulation of condition was achieved by giving the participant particular instructions to dissociate during one video only.

Stage 4 -after the video

The author then gave the participant a number of questionnaires to complete.

- Two State dissociation questionnaires (DSS), one for the first video and one for the second.
- Second & third mood ratings (all 10).
- Two PDEQs (one for the first video and one for the second).
- Attention paid to the films rating.
- Distress caused by films rating.
- Six visual analogue questions to measure the efficacy of the induction.
- Participants were asked the open question and their responses noted down.

10. An appointment was made for the follow-up in seven days time. The experimenter's contact phone number was written on the diary, and the participant was encouraged to contact the experimenter if they felt distressed during the week.

Follow up

At the week follow-up all questionnaires were completed by hand in the following order:

- Diary compliance rating.
- Cued Recall Memory and Recognition Memory Tests.
- Experimental demand question.
- The Seven day diary was used to identify the most significant intrusion

(please see Chapter one & Appendix 8 for description).

RESULTS

Statistical Analysis

These results were mainly analysed using parametric statistics, including paired-samples t-tests and one-way repeated measures analysis of variance (ANOVA). All dependent variables were tested for normality, by examining positive and negative skewness and kurtosis and calculating their significance (by dividing the statistic by its standard error). If the variable was not normally distributed, the variable was transformed using a square root transformation. Any variables that were compared with a transformed variable were also transformed to ensure a fair comparison. When the transformation failed to achieve a normal distribution, non-parametric statistics were used such as the Wilcoxon signed ranks test. In addition, correlations were used.

Missing Data

The results exclude the data from the DSS for one participant who failed to complete his third questionnaire which was administered after the control condition. Data from his other questionnaires are included in all other analyses.

Outliers.

The database was examined for outliers, by converting each individual's score in each variable into *z* scores and examining histograms with normal curves for each variable. Real outliers were defined as those which had a z score that were less than or more than three standard deviations from the mean (Tabachnick & Fidell, 1996, pp.69). Three outliers were found. For the first two, the raw score was changed to one unit larger than the next most extreme score in the distribution. The third outlier was found

in the pre-video DSS scores. The participant who obtained this score is the same as the one mentioned above who did not complete the DSS after the control condition. Consequently, all the DSS data for this participant were excluded.

Participants.

Participants had a mean score of 9.17 SD (1.01) on the HGSHS. This indicates that they are all considered highly hypnotisable.

On the DES participants' mean score was 15. There was a wide range of scores reported from 2-48. Accordingly, the median score of 11 is also reported.

Relevance of Car Crashes

Participants mean relevance rating was 4.8 SD (2.83) as there was a wide range of 0-10 the mode is also reported which was 6. At follow up I asked the participants who scored below 5 (7 in total) why they thought car-crashes were not relevant to them. All of them reported that they had changed their mind since viewing the video!

5 said it was because they could not drive, but commented that seeing the passengers in the video had made them reconsider their belief. One commented that they were an 'extremely careful driver' but in the video saw 'that it doesn't matter how good you are, it's other drivers that count'. Lastly, one reported that he had never been in a car crash. He stated that the video made him 'wonder what I would feel if one of my friends were in a crash'.

Overall, these results indicate that most participants found car-crashes to be of moderate relevance to their lives. Some participants found car crashes to have little relevance to their lives at the start of the experiment, but changed their rating at follow up. The mean number of car crashes the participants had been involved in was 0.24 SD (.43).

Experimental demand question.

At follow-up participants were asked to rate how much the hypnotic induction would increase or decrease their intrusive memories from -10 to + 10. With a score of 0 indicating the induction would neither increase nor decrease their intrusive memories. The mean rating was .41 indicating that participants did not believe the induction would affect the memories they reported.

Experimental manipulation check: predicting success of induction

Hypothesis one a)

- Those participants who reported the induction to have been more successful will obtain higher scores on the state dissociation measures.

The measure of induction success was calculated using the six visual analogue scales, in which participants rated how much they experienced the three dissociative phenomena they were asked to feel during the induction. The score itself was calculated by measuring how far across in millimetres that the participants marked the visual analogue scales in the induction condition and subtracting the control condition.

State dissociation

As in the first study, state dissociation was measured by two subjective self report questionnaires: Using a state dissociation clinical measure (the DSS), and a peri-traumatic dissociation measure commonly used for research (the PDEQ).

Table 5. To Show the Mean Difference in Ratings for How much Participants Experienced the Suggestions for the Control Condition and the Hypnosis Condition

Type of suggestion	*Mean*	*Standard Deviation*
Outside your body	51.2	(25.00)
Feeling as if you were someone else	48	(25.22)
Other people and objects feeling strange and unreal	52	(31.00)

Agreement between Measures.

To the experimenter's knowledge no-one has ever examined the relationships between these commonly used measures of state dissociation though both have been validated with other measures.

As expected, the participants PDEQ and DSS scores were correlated:

Pearson's correlation $r = .855$, $p < .0001$.

This indicates that they are both measuring a similar construct and can be considered valid measures of state dissociation.

The participants DSS state dissociation score during the hypnosis condition was correlated with how successful they rated the induction. A significant positive correlation was found: Pearson's correlation $r = .80$, $p < .0001$.

The participants PDEQ state dissociation score was also correlated with how successful the induction was meant to be. A significant positive correlation was found: Pearson's correlation $r = .55$, $p = .022$

Hypothesis one a) was supported. Participants self-report of how successful the induction was predicted their state dissociation as measured by the PDEQ and DSS.

Hypothesis one b) Trait dissociation

The DES and TDQ

According to Murray (1997) the TDQ purports to measure a similar construct to the DES. However in this study, a significant correlation was not found between the scores on the DES and TDQ: Pearson's correlation r = .455 n.s. (p= .066) As the DES is an extensively used and validated instrument, and the TDQ does not appear to be measuring the construct in this sample it was decided to only use the DES scores as the trait measure for analysis.

The DES score was significantly correlated with the success of the hypnotic induction as: Pearson's correlation r = .658 p=.004.

This means that the higher a participant scored the trait dissociation measure, the more likely they were to rate the induction successful.

- **Hypothesis one b) is supported,** those participants with a higher DES score did rate the induction as more successful (as measured by the visual analogue scales created for this study).

Controlling for other variables: attention and memory

Attention

A paired samples t-test was conducted in order to ascertain whether there was a significant difference between attention paid to the film during the hypnosis condition and attention paid to the film during the control condition.

There was no significant difference in attention found: t (19) = - 1.52. n.s (p= 0.15).

Memory

Converting the scores

As for the first study, the videos were of different lengths and there was a discrepancy between the number of questions asked for each video. i.e For the cued recall questionnaire, the video with 3 scenes had 9 questions assessing recall at one week follow-up and the video with 2 scenes contained only 6 questions to assess the recall at follow-up. In the recognition memory questionnaire, the video with 3 scenes had 13 questions and the video with only 2 scenes had 7 questions.

Again, the participants total scores were converted into proportions by dividing their score on each questionnaire by the total possible score for that questionnaire.

For example: The probability of gaining eight four in a questionnaire where the total possible score was thirteen would be .62.

This allowed the scores between questionnaires to be compared appropriately.

Cued Recall Memory.

There were no significant differences found in the number of items answered correctly from the hypnosis section of the video as compared to the control section of the film: t (15)= .65. n.s, (p= .53)

Recognition Memory.

There were no significant differences found between the number of items correctly reported on the recognition memory questionnaire when the participant was under hypnosis or control: t (16) = .46 n.s (p = .65)

These findings suggest that any differences between the two conditions in reporting of intrusive memories cannot directly be attributed to a difference in participants' ability to recall the films as measured using recognition and cued recall questionnaires. It also suggests that the increased state dissociation on the hypnosis condition does not have an effect on these aspects of memory.

First main experimental hypotheses : state dissociation

Hypothesis two

It is predicted that participants will dissociate less during the video which they asked to view normally than during the video in which they are asked to dissociate hypnotically. This will be measured by self-report state dissociation questionnaires.

Table 6. To Show Mean DSS and PDEQ scores Before the Films Were Shown, During the Induction Film, and During the Non-Induction Film.

Time	*Mean DSS*	*Standard Deviation DSS*	*Mean PDEQ*	*Standard Deviation PDEQ*
Pre-video	2.38	(3.94)	-	-
Post Hypnosis	22.56	(10.79)	23.88	(6.99)
Post Control	8.37	(4.97)	15.35	(4.83)

A one-way repeated measures ANOVA was performed in order to ascertain if there were significant differences between state-dissociation (as measured by the DSS) before the films were shown, after the hypnosis condition, and after the control condition. A significant main effect was found: Wilks' Lambda = .134; $F(2,14) = 45.3$, $p < 001$.

In order to ascertain where the difference lay, three t-tests were conducted. It was predicted that state dissociation would increase during the films as compared to baseline dissociation and that there would also be significantly higher state dissociation in the hypnosis induction condition than the controlled hypnosis condition.

Significant differences were found between the pre-film DSS scores and the hypnosis induction DSS scores: t (15) = - 9.33, p < .0001; and the pre-film DSS scores and the controlled hypnosis scores: t (15) = - 3.93, p= .001. A significant difference was also found between the DSS scores in the hypnosis induction condition and the DSS scores in the controlled hypnosis condition: t (15) = 5.56, p < .0001.

This difference was also found using the other self report measure. There was a significant difference found in state dissociation between the hypnosis and control condition as measured by the PDEQ : t (15) = 6.00 p< .0001.

- **Hence, Hypothesis Two was supported.** Participants did dissociate less during the video in which they were asked to view normally than during the video in which they are asked to dissociate hypnotically. Both self-report measures found a significant difference between the two conditions.

In order to ascertain whether participants were simply responding to experimental demand, all the items on the DSS and PDEQ which sounded like they were directly relevant to the experiment (e.g., 'at this moment in time do objects around you seem strange and unreal?') were removed and the analyses re-run.

There was a significant difference found in state dissociation between the hypnosis and control condition as measured by the DSS : t (16) = 3.22, p = .005.

There was also a significant difference found in state dissociation between the hypnosis and control condition as measured by the PDEQ : t (15) = 6.00, p< .0001.

This means that participants' state dissociation on items not directly induced in this experiment was also raised during the hypnosis condition.

Second main experimental hypothesis: intrusive memories

All participants completed their intrusions diary for a week. Only one participant reported experiencing no intrusions. Participants also rated their compliance with completing the diary. A score of 1 indicated that they noted down every intrusion, a score of 10 that they did not remember to note down any. The overall mean for compliance was 2.06 (SD=1.34) indicating that participants did record most of the intrusions they experienced.

Intrusion phenomenology

Unexpectedly, whilst the majority of intrusions were reported as belonging to the visual modality a large number were reported as being thoughts or having a thought component. This is much larger than in the previous study. Of the 85 intrusions reported, 52% were identified as images from the films, 41% as thoughts from the films, and 7 % were images which were unable to be identified within the films. One of these was a report of the participant remembering themselves watching the film and therefore could not be attributed to either of the films as no content other than themselves was reported. Interestingly, the remaining unidentifiable images were clearly not in the film. For example, one participant noted an intrusion of a 'cut stomach with intestines protruding'. This image did not occur in either of the films. In order to aid understanding of the phenomenology of the intrusions a full list of the images that were experienced by the participants are presented below.

Table 7. To Show Intrusions Reported by Participants and the Condition their Most Significant Intrusion was Derived from

Intrusion description	No of subjects reporting this intrusion	No of subjects reporting this intrusion as their most significant.	Condition in which most significant intrusion occurred
Fireman spraying burning car	2	0	Neither
Bloody baby being carried	3	1	control
Man behind wheel of car, metal cutting through his legs	1	0	Neither
Woman trapped in car	2	0	Neither
A man's bleeding knee	1	0	Neither
Woman's legs bleeding	1	1	control
Paramedics/ firemen around man in wreck	1	0	Neither
Body covered by blanket	1	1	Control
Men dragging body	1	0	Neither
Body/ies in coffin	2	0	control x2
Dead man being covered by a blanket (2 rescuers covering him	1	0	Neither
Man hanging out of car door	1	0	Neither
Commentary children still financially dependent	1	0	Neither
Girls face with tubes	8	5	Hypnosisx2 control x3
Cut stomach with intestines protruding	1	Rated as most significant	NOT IN EITHER FILM
Cars going over speed and crushing	1	0	NOT IN EITHER FILM

Table 8. To Show the Total Number of Intrusions that were Identified as Belonging to the Hypnosis Induction Video, the Control Video and the Additional Intrusions that were unidentifiable.

	Intrusions Hypnosis Video	*Intrusions No-task Video*	*Unable to identify*
Total no	15	29	41
Mean	.88 SD(.99)	1.7 SD(1.5)	2.4 SD(2.9)

Hypothesis three: intrusive memories and state dissociation

Contrary to predictions, there was not a significant difference reported in the number of intrusions reported from the phase of the film in which the hypnotic induction was conducted as compared to the control phase of the film: t (16) = -2 .08, n.s (p=.054) In addition, the number of days upon which intrusions were experienced to the hypnotic induction phase of the film were not significantly greater than the number of days with intrusions from the control phase of the film: t (16)= -.1.98, n.s. (p=.066). Therefore, being hypnotised to dissociate did not lead to a significant increase in the number of intrusive memories as compared to viewing the film whilst hypnotised with no instructions to dissociate. In addition, the means actually show a non-significant trend in the *opposite* direction to that predicted, which almost attained significance at the .05 level.

- **Therefore, Hypothesis three was not supported**. Intrusive memories of the film experienced during the following week which were identified as belonging to the hypnosis condition, were not of a significantly higher frequency than those in the control condition. Additionally, participants did not experience a significantly greater number of days with intrusions from the hypnosis condition.

Hypothesis 4: trait dissociation and intrusive memories

The DES

Scores on the DES were found to not significantly correlate with the overall total number of intrusions reported for each participant across both conditions: Pearson's correlation r = .15, n.s. There was also no correlation between the DES scores and the hypnosis induction intrusions only, Pearson's correlation r = .18, n.s. and the control intrusions only Pearson's correlation r = .31, n.s.

Therefore intrusive memories are not predicted by variations in the level of trait dissociation as measured by the DES.

The DES-T

The DES-T variable was not normally distributed, efforts to transform the data using transformations did not significantly reduce the positive skew so the original variable was used for the analysis. This should be borne in mind when considering the results. Items on the DES which comprised the DES-T were also correlated with the total number of intrusive memories. The correlation was not significant. Pearson's correlation r = . 40 n.s. (p=.11)

Hence, a higher score on the DES-T (the pathological form of trait-dissociation) is not associated with an increase in intrusive memories.

- **Hypothesis four is partially supported as higher trait dissociation** as measured by the DES does not lead to a greater incidence of intrusive memories. Participants with a greater score on the DES do not have a greater number of intrusions overall. However, a higher score on the pathological form of trait-dissociation (the DES-T) also does not lead to a greater incidence of intrusive memories.

Hypotheses five and six: emotional numbing

The following results are concerned with how participants responded to both films emotionally.

Hypothesis five: mood

All participants were asked how much they felt 10 different mood states on a scale of 1-10 where 1 indicated they did not feel that mood at all and 10 indicated an extreme level of that mood. The mean ratings across participants for all emotions are displayed on the subsequent page.

Table 9. To Show the Means of Mood Ratings Pre-film and after the Induction and Control Conditions.

Measure Mood rating	Pre-Film Rating Mean (SD)	Induction Condition (post-film rating) Mean (SD)	Control Condition (post-film rating) Mean (SD)
Happiness rating	6.48 (1.12)	2.64 (2.00)	2.47 (2.24)
Anxiety rating	3.71 (2.17)	4.00. (2.74)	4.71 (2.49)
Depression rating	1.17 (1.67)	2.52 (2.43)	4.11 (1.93)
Anger rating	1.35 (2.06)	2.00 (2.32)	3.00 (2.40)
Fear rating	1.65 (1.87)	2.88 (2.42)	3.65 (3.12)
Horror rating	.65 (1.66)	4.94 (2.66)	5.88 (2.74)
Helplessness rating	.76 (1.25)	4.29 (2.44)	4.24 (2.36)
Disgust rating	.52 (1.50)	3.88 (3.00)	4.18 (2.79)
Ashamed rating	.35 (.70)	1.41 (1.37)	1.76 (1.75)
Guilt rating	.76 (1.25)	1.41 (1.33)	2.18 (2.10)
Total negative mood	14.47 (11.1)	34.7 (17.01)	41.0 (16.15)

The total negative mood score across each condition was calculated by summing the above nine variables and adding the inverse score for happiness.

This measure showed a high correlation in the previous study and also in this study indicating it is appropriate to sum these measures: Coefficient Alpha = .88.

A one-way univariate repeated measures ANOVA was performed in order to ascertain if there were significant differences between negative mood state before the films were shown, after the hypnosis condition, and after the control condition. A significant main effect was found: Wilks' Lambda = .186; $F(2,15) = 32.7$, $p < 001$.

In order to ascertain whether the difference between pre-video and post control condition was significant; a number of t-tests were conducted. There were significant differences found between the pre-video negative mood score and the hypnosis induction negative mood and the pre-video negative mood and the control negative mood: $t(16) = -5.37$, $p < .0001$; $t(16) = -8.17$, $p < .0001$.

There was no significant difference found between the hypnosis and control condition negative mood scores.

This finding means that participants' mood was more negative whilst watching the two videos than before the video. There was no differential emotional numbing observed between the hypnosis induction and the control hypnosis condition. The means however, demonstrate a difference in the predicted direction.

In order to test the hypothesis that both depression and fear would be lower in the control condition, than the hypnosis induction condition, two t-tests were performed. Participants rated a significantly lower feeling of depression for the hypnosis condition than for the control condition: $t = (16) - 2.89$, $p = .011$. No such significant difference was found for fearfulness: $t = (16) - 1.14$, n.s.($p = .27$).

This means that feelings of depression were significantly lower for the hypnosis induction condition perhaps because participants were in some way inhibiting these emotional responses during the film but not inhibiting them in control condition. This inhibition did not occur for their feelings of fear.

- **Therefore Hypothesis five a) was not supported** as during the hypnosis phase of the film, participants did not appear to experience more peri-traumatic emotional numbing than when they perform no task during the film as measured by post-film negative mood ratings. **Hypothesis five b) was partially supported,** depression was significantly lower in the hypnosis induction than in the control condition but fearfulness was not significantly lower during the hypnosis condition than during the control condition.

Hypothesis six: distress

Participants rated their distress whilst viewing the videos out of ten, the mean distress score was 4.5 SD (2.29) in the hypnosis induction condition and 6.47 SD (2.00) in the control condition.

Viewing the film whilst hypnotised to dissociate resulted in less distress than viewing the film normally: t = (16)- 3.48. p= .003.

This result suggests that participants were experiencing less distress during the hypnosis induction condition than during the control condition.

- **Hypothesis six was supported,** during the control film, participants obtained higher distress ratings than during the hypnotic induction film.

Participants self-report in response to the open question.

A full description of participants' comments can be found in appendix 14. An initial examination of the data suggested that some participants consciously acknowledged that they felt emotionally numbed. For example one participant in this study reported that: 'I felt less involved and interested than the other video. I was watching and feeling it should be a lot more distressing'; another commented: 'it didn't seem half as bad, the people in it were just actors and it didn't seem half as gruesome'.

DISCUSSION OF EACH HYPOTHESIS

This section discusses each hypothesis from study two in detail. It explains the specific implications of each finding and discusses the results in relation to existing literature and methodology.

The general discussion for both studies is contained in the following chapter, and gives broader consideration of the clinical implications of these findings and suggestions for further research.

All hypotheses are presented in the same order as in the preceding results section.

The main findings are summarised below with the intention of giving an overview of the results.

- Participants were able to perform the hypnotic suggestion. This had the effect of increasing their state dissociation.

- Increased state dissociation did not lead to a greater incidence of intrusive memories.

- Participants reported less distress and depression during the video they watched while they were performing the hypnotic suggestion.

Experimental manipulation check

- Hypothesis one a) was supported. Those participants who reported the induction to have been more successful (as measured by the visual analogue scales created for this study which enquire how much the participants felt as though they were feeling the sensations the hypnotist had asked them to) were also higher in state dissociation during the hypnosis condition and overall.
- Hypothesis one b) was supported. Those participants with a higher DES score did rate the induction as more successful (as measured by the visual analogue scales created for this study enquiring as to how much the participants felt as though they were feeling the sensations the hypnotist had asked them to).

In considering hypothesis one b), one could argue that the participants were rating the induction as successful in order to satisfy experimental demand. This appears improbable as it is unlikely that participants' DES scores would then correlate with the visual analogue scales by chance. This also holds true for the increase in subjectively reported state dissociation during the hypnosis condition. The participant is unlikely to know how the experimenter would like them to endorse items on the PDEQ and DSS so they are unlikely to be able to respond in the experimenter's favour by trying to second-guess the predictions.

In addition, participants did not uniformly report an effective induction on all three forms of dissociation, suggesting that willingness to please the experimenter may not have been an important factor in these findings.

These findings show that people with a greater dissociative tendency as measured by the DES are more likely to be able to dissociate when instructed to do so in a hypnotic condition. One possible explanation for this is that those participants with a higher

trait dissociation score may have been able to perform the tasks they were instructed to during the induction as because they naturally have the experience of dissociative phenomena and so will not find the instructions so unusual.

Consequently, scores on the DES could be used in future studies to predict those participants who will be more likely to achieve the experimental effect we are hoping to achieve. This study only examined three different forms of dissociation, so we can only conclude with certainty that the DES can help to predict the likelihood of participants being able to experience those forms of dissociation.

Hypothesis one a) was also supported which means that when participants reported the induction to have worked, their state dissociation was also significantly higher in the hypnosis condition. It was possible that there may have been a carry-over effect; that is, when the dissociation induction was presented first, participants may still continue to dissociate even when the induction had been removed for the second film. If this had occurred, it would have raised questions about the efficacy of our induction. As no such difficulty arose, we can conclude our experimental manipulation was effective and interpret the rest of the results in light of that finding.

Controlling for other variables: attention and memory tests

- There were no significant differences found between attention paid to the film in which the hypnosis induction was performed and the control film.
- No significant differences were found between recognition and recall memory across both conditions.

This finding is the same as the previous study, in that any differences we find on our dependent variables of dissociation and intrusive memories cannot be attributable simply to memory or attention conditions across films. This has been a consistent finding across research of this nature as both Holmes (2000) and Hennessey (2002) also found no differences.

First main experimental hypothesis

State Dissociation

- Hypothesis two was supported. Participants dissociated less during the video in which they were asked to view normally than during the video in which they were asked to dissociate hypnotically. Both self-report measures found a significant difference between the two conditions.

This means the experimental manipulation of dissociation was successful, and that we have found an ethical way in which to evoke three aspects of state dissociation during an analogue trauma, in the laboratory. This has never been achieved before using hypnosis.

There is still not enough research in the field for us to predict conclusively whether we would be able to induce other forms of dissociation in the laboratory, as there is currently no model which suggests how they are all related. Presumably, this is because of the confusion in the field about what dissociation actually consists of. However, an unexpected finding in this study was that state dissociation increased in the hypnosis condition even when those items on the questionnaires which measured the precise forms of dissociation induced were removed from the analysis. This raises the question of how different forms of dissociation are related to each other. It would

be extremely valuable to repeat this experiment using a much larger sample size, then we could examine endorsement of different items on the questionnaires and through factor analysis see whether as one elevates; another is also likely to elevate. It also raises the possibility of being able to induce many forms of dissociation separately and seeing whether another form naturally increases or decreases at a similar level. This will open up a number of research avenues. The little research that has been conducted suggests experimenters have been able to evoke the phenomena of 'feeling detached from the situation both physically and emotionally', 'feeling as if you are watching what is going on in a dream' and emotional numbing (Sivers, 1999; Bryant, 2002).

While important for the design of my study, it is interesting that there were no differences found on the memory tests. Dissociation is often associated with amnesia for traumatic events. In this study I specifically tried to emulate the 'detachment' form of dissociation as suggested by Holmes et al. (2002), so I was not trying to evoke amnesia for the film in which the dissociation induction was performed. This may lend tentative support to the suggestion that there are two categories of dissociation and that amnesia is more important for the 'compartmentalisation' to occur. 'Compartmentalisation' is also found across the clinical population, particularly where there has been repetitive trauma (Chu & Dill, 1990). It would therefore be useful to examine this relationship as well, though careful consideration would have to be given to the memory measures. Any memory system must perform 3 functions: it must allow information to be fed into the system (the input stage), it must be able to maintain the information (the storage stage), and it must be able to access the information when appropriate (retrieval) (Cohen, 1996).We need to understand in which way all of these stages are affected in clients with dissociative disorders and

PTSD, if we are to understand the link between dissociation and later intrusive memories. Using a similar experimental paradigm, Dual-representation Theory for example, would predict that a free-recall task of traumatic memory would be most likely to be impaired in clients who have experienced peri-traumatic dissociation.

Second main experimental hypothesis

Intrusive memories and state dissociation

- Hypothesis three was not supported. Intrusive memories of the film experienced during the following week which were identified as belonging to the hypnosis condition, were not of a significantly higher frequency than those in the control condition. Additionally, participants did not experience a significantly greater number of days with intrusions from the hypnosis condition.

There are at least six possible explanations for the insignificant difference found between the number of intrusive memories reported for the control condition compared with the dissociation hypnosis condition. These are outlined below.

1. Losing control

Gershuny and Thayer, (1999), have suggested that dissociation and trauma-related distress are fundamentally related to fears about death and loss, and/or a lack of control beyond what seems indicated by the traumatic event itself. If these fears are key to later intrusive re-experiencing, then hypnosis may not be able to evoke dissociation as experienced during trauma. In hypnosis, the fact that the participants have given over their sense of control to the experimenter is likely to mean that their

fear of losing control is not so strong. All the participants in this study had volunteered to be hypnotised on at least three occasions and so presumably trusted the hypnotist, or at the very least, the process of hypnosis itself. Hypnosis itself is typically reported to be a relaxing experience. Yet, these difficulties with hypnosis are somewhat offset by the fact that participants typically experience hypnotic suggestions as involuntary, whereas all previous attempt to manipulate dissociation have required participants to voluntarily experience the dissociation. The difficulties with the relaxation effect may mean that hypnosis will never be able to imitate dissociation at the time of trauma precisely but it still raises interesting ways of examining the phenomenology. Given that control-related fears seem so important, in future studies we could directly examine participants' beliefs about control and fears of death and loss to see if a greater fear is predictive of dissociation and/or later intrusive memories.

2. Intrusion phenomenology

In considering the following explanations, it is important to remember the phenomenology of the intrusions in this study.

Unlike Holmes' (2000) study and the grounding study around half of the intrusions were not reported as belonging to the visual modality; they were reported as thoughts only. This made it extremely difficult to rate whether an intrusion was related to the hypnosis induction film or the control hypnosis film. If the design was modified so that participants experienced the two videos on different days, or if a between-subjects design was used in which one group did not receive the induction, we would be able to see whether the induction actually leads to more reported intrusive memories, and thus avoid this difficulty.

The fact that some intrusions occurred which were not in the film may be explained by highly hypnotisable people being likely to have more false memories. False memories are known to occur in highly hypnotisable people even if they are not hypnotised. Using a standard post-event suggestion paradigm, Barnier and McConkey (1992) demonstrated that high hypnotisables confidently recalled more false memories than the low hypnotisables.

Source Amnesia.

An often reported phenomenon in hypnosis is that of source amnesia. This occurs when participants recall previously learned information but indicate that they do not know where the information was learned (Evans 1979).

Participants experiencing source amnesia remember some content of what they have experienced but have divorced it from the context in which it was learned.

This could explain why participants found it difficult to describe the exact intrusion that they experienced. However, this may not explain why there was no significant difference found in intrusive memories across conditions, as if I had been able to rate all of the intrusive thoughts it is probable that I would have found a similar rate of forgetting across both conditions. It is of course possible though, that the majority of unidentifiable intrusions were pertinent to only one of the conditions.

Generic (vague) recall

Participants who are highly hypnotisable have been found to have a vague, general idea of the material they should remember, but recall is not entirely successful as there is a lack of clarity. Relevant experiences seem to be processed one at a time, and 'not as an ordinary stream of experience that would normally facilitate ongoing recall' (Evans, 1988). This could explain why participants were able to complete the memory

questionnaires in which they were given cues, but struggled to explain the content of their intrusive memories in their diary.

I am not aware of any studies which have looked at vague recall after hypnosis in high hypnotisables; on a highly speculative note, it is possible that it is the experience of hypnosis itself which leads to these difficulties, as it is not until they are given further cues to recall that they are able to recall more of their experience, and even then, the descriptions are vague.

3. Methodology.

Unlike previous studies (Murray, 1997; Saunders & Brewin, 2001; Holmes, 2000), this study used two video tapes. This meant participants performed the dissociation induction for five or eight minutes depending on which video they were allocated. It is possible that participants need to be traumatised for a longer period than five to eight minutes for an effect to occur. This seems unlikely though, as clinical findings are that during imaginal exposure therapy, PTSD patients typically report 'hotspots' which correspond to their most significant intrusion of the event (Richards & Lovell, 1999). These are typically brief moments in time.

Future research could look for 'points' of dissociation after Holmes (2000). She found that the participant's heart-rate (HR) during a sequence in the film which corresponded to an intrusion was lower than their mean HR during the rest of the film. This suggests that specific points of peri-traumatic dissociation as indicated by low heart-rate predict intrusions rather than the presence of dissociation generally leading to intrusions. We could attempt to emulate this by asking participants to dissociate at specific points in the film. This could be achieved by having a salient symbol appearing on the screen (this would have to be countered by another symbol

appearing which they were informed not to dissociate to, to avoid the argument that intrusive memories merely occurred when a salient symbol was presented). This may more effectively imitate the clinical picture. We could then record participants heart-rate at these times. Before this is attempted, however, it would be necessary to ascertain why participants were unable to adequately describe their intrusions in their diaries in this study, or the proposed study would also suffer from an inability to attribute intrusions to specific points in the films.

Inducing dissociation through hypnosis

After the piloting phase of the experiment, it was deemed unnecessary for participants to practise the dissociation induction prior to the experiment as they were all able to perform the induction immediately. In retrospect it may have been better to have heeded the advice of Van Quekelberghe, Gobel and Hertweck, (1994-1995), who devised an experiment to simulate near-death and out-of-body experiences, stressing the importance of using participants who were all novices in hypnosis.

Firstly, they reported finding an advantage in introducing the hypnosis towards the end of the session rather than immediately after the relaxation phase, in that participants could more actively perform the required task (though did not provide any evidence to support this claim). Not long could be left between the relaxation and the induction in this study as the process already took one and a half hours. This was because it was decided that it was more important to maintain the goodwill of the participants who were also expected to attend for a follow-up the next week. There is no evidence to suggest that this impacted negatively upon the results in this study. However, it is possible that a longer time interval may have led to a stronger experience of the dissociative phenomena, which may in turn have led to a greater

number of intrusions. In future studies this could be tested by giving participants a greater incentive to participate for longer, perhaps by paying them more.

Secondly, it is possible that previous experiences of hypnosis may have contaminated participants response in this study. All participants had previously been given the suggestion that they would forget what they learned in the hypnotic experience as part of the initial screening for high hypnotisability. The Harvard Screening Scales' last instruction is 'you will remember nothing of what has happened until I tell you to do so'. It is possible that participants could be carrying over a previous learnt suggestion to forget everything they had experienced during hypnosis. Why this should only occur for those parts of the film corresponding to the dissociation suggestions and not for the control hypnosis is unclear. It is possible that the participants were aware that the suggestion was the critical part of the hypnotic experience. It is also possible that they used this previously learnt experience in order to act unconsciously to block those aspects of the experience which were most distressing for them.

4. A Protective effect of dissociation?

We can still only speculate what evolutionary advantage appearing to be outside one's body can have for people experiencing a traumatic event. This particular phenomenon is usually categorised as an aspect of depersonalisation, which has been postulated to occur in order to help clients escape from emotional pain. It has been suggested that dampening high levels of arousal can help to increase alertness and widen one's perspective of the scene around you in order to best devise a plan for how to deal with the current situation (Sierra & Berrios, 1998; Senior, Hunter, Lambert, Medford, Sierra, Philips & David, 2001). It is conceivable that this form of dissociation is

actually protective for later intrusive memories, but that the time in which one 'returns' to their body, or the time just prior to 'leaving', is the period in which one is most likely to experience intrusive memories. Indeed, one participant in this study reported that: 'I felt less involved and interested than the other video. I was watching and feeling it should be a lot more distressing'. Another commented: 'it didn't seem half as bad, the people in it were just actors and it didn't seem as half as gruesome'. This provides tentative support for the hypothesis that leaving one's body may help to avoid emotional pain. As the field is still so new, it would be helpful for future studies to focus on participants' actual experiences and conduct a qualitative analysis of them. (Please see appendix 14 for all comments made by participants about how the experience felt for them).

5. Dual Representation Theory

A further possibility is that asking participants to imagine themselves outside of their bodies may actually be asking them to perform a visuo-spatial task. As previously stated, according to Dual-Representation Theory (Brewin et al., 1996) whilst performing a visuo-spatial task you will be more likely to encode memories in the VAM system which is more like ordinary autobiographical memory and less likely to trigger intrusions. In fact, less intrusions were reported for the hypnosis condition than the control condition and while this difference did not attain significance, this may have reflected a lack of power within this study. It is possible that we may have found a greater effect if we had a larger sample size. We could test this hypothesis further by conducting experiments simulating other forms of dissociation which can and cannot be considered to be visuo-spatial and comparing the intrusive memories experienced to each.

Another possibility is suggested by the phenomenology of the intrusions themselves. Participants struggled to describe their intrusions verbally. It may well be that in this experiment we are actually observing memories which are *closer* to those experienced in PTSD. In PTSD a perceptual cue associated with a previous trauma can serve as a trigger to an emotional response. Situationally Accessible Memories (SAM's) are proposed to be the hallmark of inadequately processed traumatic experience and they usually occur in the absence of verbally accessible memory (Brewin et al., 1996). Participants found it very difficult to describe their intrusive memories in their diaries and many reported feeling fear when seeing cars or crossing roads (perceptual cues). When asked to describe their memories in more detail at follow up participants were unable to adequately describe their intrusions for identification purposes. This was in stark contrast to the participants in the grounding study.

Does peri-traumatic dissociation lead to later intrusive memories?

Finally, in light of our finding that the manipulation was successful, it cannot be argued that participants failed to have more intrusions in the hypnosis condition because we failed to manipulate dissociation effectively. We have to consider the possibility that peri-traumatic dissociation does not lead to intrusive memories. Indeed, it could be argued that literature supporting that traumatic events and dissociation are linked, (e.g.Marmar,1994; Bremner & Brett, 1997; Griffin, Resick and Mechanic, 1997) has too many methodological flaws, due to nature of memory and difficulties with retrospective rating. However, as argued in the introduction, some researchers have controlled for these difficulties (eg: Holen, 1993; Holmes (2000). Both studies in this thesis have also found a naturally occurring increase in state dissociation in a population without mental health difficulties when the

participants watched the videos in the control condition as did Hennessy (2002) and Holmes (2000).This suggests that increased dissociation is likely when someone experiences a stressful event. If we accept that trauma does increase state dissociation, the key question that still remains is whether dissociation leads to later distress and/or intrusive memories. Gershuny and Thayer (1999) have proposed that clients' beliefs about control and fears of death and loss are key. I would like to propose that it may not just be those beliefs which are key to later symptomology but also clients' beliefs about dissociation itself.

6. The Meaning of Dissociation

It may be the *meaning* of the dissociation that is important to participants and clients, which could account for why participants did not experience more intrusive memories in this study. As already discussed, participants did not fear losing control in this study, but the very fact of being in an experiment will also fundamentally affect all their attributions. We know that the use of cognitive-behavioural techniques is efficacious in treating PTSD (e.g. Foa, Steketee & Rothbaum, (1989); Sharpe, Tarrier, & Rotundo, (1994); Ehlers & Clark, 2000, etc.) All suggest that it is not only the physiological responses and contents of the fear memory which are important in maintaining PTSD but that the attributions of meaning to the fear memory are also critical. Participants may for example attribute the meaning of objects around them being strange and unreal to 'I am being a good participant', whereas clients experiencing a real life trauma are more likely to experience attributions like: 'I can't cope' or 'I'm going mad', as they do not understand what is happening to them. This notion will be discussed further in 'clinical implications'.

Trait Dissociation

- **Hypothesis four is partially supported** as higher trait dissociation as measured by the DES does not lead to a greater incidence of intrusive memories. Participants with a greater score on the DES do not have a greater number of intrusions over all. However, a higher score on the pathological form of trait-dissociation (the DES-T) does not lead to a greater incidence of intrusive memories.

This result replicates the finding in the first study, and Holmes (2000) and the postulated reasons for this result were discussed on pages 67-68.

The finding in the grounding study with a random sample, and Holmes' finding with a sample of highly dissociative students, is also apparent in this sample who are highly hypnotisable, which suggests that the finding may be generalisable to other populations. A replication of a previous result also suggests that the finding can be considered more reliable as is not as likely to be attributable to type 2 error.

Mood and distress

- Hypothesis five a) was not supported as during the hypnosis phase of the film, participants did not appear to experience more peri-traumatic emotional numbing than when they perform no task during the film as measured by post-film negative mood ratings, though there was a trend in the predicted direction.

- Hypothesis five b) was partially supported as depression is reported to be experienced more in the control condition than the hypnosis condition, but fear is not.
- Hypothesis six was supported. During the control film, participants obtained higher distress ratings than during the hypnotic induction film.

The straightforward interpretation of these results is that a composite score of negative mood change is not related to dissociation as in the previous study. Alternatively, the null finding of hypothesis 5a may represent a problem with statistical power as the mean negative mood score in the hypnosis condition was considerably lower than that in the control condition, though this did not obtain statistical significance. If this is the case, it may indicate that the effect size we should be looking is smaller than anticipated. It was difficult to predict a potential effect size in this study as these mood measures have not been used in a study before.
Using a larger sample size would help to reveal a smaller effect size if present and if it did not, we would be able to state more conclusively that these moods do not appear to be a central part of the dissociative experience we are inducing during trauma. We must be aware though that it is possible that it is only in real-life traumatic situations that such an effect would be seen to occur. This would particularly apply to the lack of a significant difference in fear across the two conditions, which we would expect in an actual trauma. However, this may also reflect a lack of power in this study as the trend was in the predicted direction.

Overall, these findings suggest that emotional numbing for these particular feelings (depression and distress) occur *at the time* of the traumatic event. This would mean

that emotional numbing should not merely be construed as a secondary avoidance strategy as in DSM IV. Other researchers have argued that the three factor model proposed in DSM IV does not fit the available data and have proposed that emotional numbing should be placed on a separate cluster all on its own (King, Leskin, King & Weathers 1998). This study would tend to support their proposal. These findings also contradict Horowitzs'(1986) information processing theory which suggests that emotional numbing occurs in response to the aversive emotions which are associated with re-experiencing.

Participants were not explicitly asked to try to dampen their emotions which suggests that, this either naturally occurs while experiencing high levels of dissociation, or some particular factor in our induction created this effect. We asked the participants to imagine themselves outside their body and see themselves as if looking at another person, which as stated, is an aspect of depersonalisation. This has been postulated to appear in response to high emotional arousal. It is also possible that the numbing appeared in response to our suggestion that the world seemed strange and unreal, though there is no theory to account for this.

This finding also suggests that Litz's (1992, 1997) proposal linking emotional numbing to hyperarousal may be rather overstated. It seems likely that participants were suffering at least some hyperarousal (this could be ascertained by taking physiological measures in future studies), but this state was not prolonged, and the effect must have occurred within the brief time-period of the video. The link that has been found between hyperarousal and emotional numbing may also be explained by hyperarousal being a necessary precursor to emotional numbing occurring. There would be no need to dampen down arousal if it were not already at an uncomfortable level. Loading on the same factor may simply mean that it is only those people who

are likely to experience hyperarousal symptoms who will also exhibit emotional numbing. There does not necessarily need to be a prolonged period of hyperarousal to explain the numbing effect, though it is probable that prolonged hyperarousal would reinforce the numbing effect.

In conclusion, this study demonstrated that both depression and distress were significantly lower when participants were reporting higher levels of dissociation. No such effect was found in the grounding study in which participants failed to record high levels of dissociation.

CHAPTER FOUR

GENERAL DISCUSSION

GENERAL DISCUSSION

The links between both studies

Both studies in this thesis had the shared aim of attempting to manipulate dissociation under laboratory conditions. One study aimed to increase state dissociation during a trauma film and the other to decrease spontaneously occurring dissociation to that film. The grounding study (study 1) used the manipulation of Plasticine in order to reduce dissociation. The evidence for Plasticine helping to reduce dissociation is entirely clinical and anecdotal. It is simply reported by clinicians to be helpful when clients such as those with a diagnosis of borderline personality disorder are dissociating (Kennerly, 1996; Linehan, 1993). We know from other experimental studies using a stressful film paradigm (Holmes, 2000; Holmes, Brewin & Hennesey, 2002) that viewing the trauma film results in a spontaneous increase in dissociation. Therefore, grounding using Plasticine might be used to reduce this dissociation. In contrast, regarding study 2, there is some evidence to suggest that participants can be hypnotised to dissociate. (Van Quelkelberghe et al., 1994; Sivers, 1999). I therefore used hypnosis to attempt to increase dissociation during the stressful film in study 2.

The overall hypothesis was that dissociation acts as a mediator to later spontaneously occurring intrusive memories. In study 1, it was predicted that increased dissociation during the stressful film would lead to an increase in later intrusions. In study 2 it was predicted that decreased dissociation would lead to fewer intrusions. Neither of these predictions were supported by the experimental findings. Dissociation was successfully increased in the hypnosis study (study 2) but there was no consequent increase in intrusive memories. Dissociation was not successfully decreased in the grounding study (study 1) but intrusive memories were decreased.

The over-arching theory which can make the links between the predictions and the findings of the two studies is that of dual representation theory (Brewin et al., 1996). This theory differs to most theories of emotional memory investigated in mainstream experimental research, which usually examine effects upon standard measures of recognition and recall (e.g., Cahill, 1997). Dual representation theory is different because it explicitly tries to address the mechanisms which underlie the 'flashbacks' or spontaneously occurring images which are so prevalent in PTSD and so is relevant to trauma event memory. It states that information about the trauma which requires a high level of conscious processing is laid down in the verbally accessible memory system (VAM) .This forms the basis of subsequent verbal accounts of the trauma which can be deliberatively retrieved and so corresponds to ordinary autobiographical memory. Information that does not receive sufficient attention will instead be encoded into the situationally accessible system (SAM). This system tends to store sensory information, particularly visuo-spatial information, in the form of images. This theory would predict that any task which interferes with encoding into the SAM system would decrease later spontaneously occurring images of the traumatic event. Those tasks which primarily interfere with VAM representations would increase intrusive images. The altered consciousness and dissociative symptoms that typically appear in trauma may entail a selective interference with encoding into the VAM system; hence these sorts of experiences should lead to an increased number of intrusions (Holmes, Brewin, & Hennesey, 2002).

Hence, the Plasticine task, was predicted to reduce intrusions. This is because according to dual representation theory, a task which hindered input to the SAM system by depleting the capacity to encode visuo-spatial and sensory information

would decrease intrusions. This means that one would expect a reduction in spontaneously intrusive memories in the grounding task, whether or not the clients reported a decrease in dissociation. In this study I found that the manipulation of Plasticine did not lead to a reduction in self-reported state dissociation. I have therefore not found a way to decrease dissociation under experimental conditions using this technique. This result suggests that the explanation clinician's typically ascribe to the beneficial effects of Plasticine in therapy may be incorrect.

Interestingly however, the main finding from study 1 was that there was a reduction in intrusions. Hence the Plasticine manipulation *was* beneficial as participants reported a reduction in subsequent spontaneous intrusive memories. This beneficial effect can be explained through recourse to dual representation theory if we understand that the Plasticine manipulation will be utilising visuo-spatial resources and hence selectively interfering with encoding into the SAM system which supports intrusive imagery. However, this reduction was not found to be through the mechanism of dissociation.

In the second study I was able to successfully demonstrate an increase self-reported level of dissociation. This indicates that a way to mimic dissociation during analogue trauma has been found. However, there was no consequent increase in intrusive memories. Dual representation theory would predict that any task which primarily disrupted VAM encoding during a trauma would lead to increased intrusions. Hence, the dissociation task given to participants in the hypnosis condition should have directly interfered with encoding into the VAM system if hypnosis utilises similar resources to the VAM system. A possible explanation for why this effect was not seen to occur is that the form of suggestion which we chose to evoke (leaving one's body),

may have been using some elements of the visuo-spatial SAM system as this suggestion requires the person to visualise themselves as outside themselves. This may mean that the hypnosis task set did not compete for resources within the VAM system. We can test whether it is the form of the dissociation which has led to this unexpected result by replicating the study using a different form of dissociation which is less visuo-spatial and more verbal. An example would be utilising a hypnosis task in which participants 'feel like things that were actually happening to others were happening to me-like I was being trapped when I really wasn't'. This is more likely to interfere with the VAM system than the SAM system as it does not contain information which is likely to compete for visuo-spatial resources within the SAM system.

Another possible explanation for the hypnosis task failing to increase later intrusions is that the task itself may not have been elaborated verbally sufficiently during the film, unlike during a real trauma. This is because the participants were unlikely to have been searching for an explanation for why the dissociation was happening to them. According to dual representational theory and other cognitive models of traumatic events (e.g., Ehlers & Clark, 2000), people may catastrophically interpret what is happening to them during trauma. In this study, participants are unlikely to have been trying to interpret the sensation of dissociation in order to attribute meaning to what was occurring by wondering for example; Am I going mad? Instead they would have already had an explanation for their experience (hypnosis) which may mean their experience was not being elaborated verbally in the same way as during an actual trauma.

The results of both these studies suggest that contrary to predictions, dissociation as measured by self-report during analogue trauma, does not moderate the number of later intrusions experienced. The results of the grounding study are still explicable in terms of dual representation theory as the Plasticine may be acting as a task which interferes with the SAM system, potentially due to its visuo-spatial features. However, the finding that increased dissociation does not lead to a greater number of intrusions is more difficult to explain in terms of dual representation theory. I have, however outlined a possible explanation for this which could be tested in the future.

Possible alternative explanations for these findings including suggestions for future replication of this experimental paradigm

Measurement Issues

In both studies, no within-subjects differences were found between conditions on measures of recall memory, attention and cued recall. This has been a consistent finding across research of this nature as Holmes (2000) Brewin and Saunders (2001) and Hennessey (2002) also found no differences between groups on these measures.

These experimenters had used a between subjects paradigm. My studies were both within subjects in which it could be argued that participants were failing to report differences in memory and attention between the two films due to experimental demand. It is difficult to argue this however when no differences were found in a between subjects design as participants would not know how others were responding on these questionnaires.

Whilst it is important to show that participants did not perceive any lack of attention to the film during the concurrent tasks of grounding and hypnosis, it is likely that any

concurrent task will have been utilising general attentional resources throughout its performance. The simple measure of attention used in these studies is unable to measure this directly. However, it is very difficult to measure the more general attentional demand of the tasks using this paradigm. We can nevertheless, attempt to demonstrate that it is the visuo-spatial elements of the grounding task that are of central importance in reducing later intrusive memories.

Visuo-spatial or a general attentional demand?

Due to the difficulties with measuring general attentional demands, one could argue that the plasticine task in study 1 was only acting to interfere with encoding of the film memory in general, and not specifically interfering with the SAM system.

It is extremely difficult in practice to devise a task which varies only in visuo-spatial demand as they are invariably dependent on general attentional resources as well. (Miyake, Friedman, Rettinger, Shah, & Hegarty, 2001). It is however, possible to vary the combination of general attentional and visuo-spatial demands.

Holmes, Brewin and Hennessey (2002) varied the demands of their concurrent visuo-spatial task in the second experiment of their series, in order to provide support for the importance of the visuo-spatial aspect of their task. In this study, participants were assigned to either a control condition or to one of three concurrent task conditions which employed tapping letters on a MOAR box. The concurrent tasks had three levels, simply pressing a key, pressing a five letter key sequence which had been over-practised, and pressing the same five letter with minimal previous practice. They hypothesised that over-practise should reduce general attentional demands whilst largely preserving the the visuo-spatial element of their task. They found a linear

relationship between the increased levels of visuo-spatial and general attentional demands at encoding and reductions in later intrusive memories. The importance of the visuo-spatial element of the task is supporting by the finding that when the complex tapping was successfully over-practised, there was still a significant reduction in spontaneous intrusive memories as compared to the control no-task condition.

In order to further investigate the relative importance of the visuo-spatial components of the Plasticine manipulation task, in contributing to the reduction in intrusions, my grounding experiment could be replicated. Additional within-subjects conditions could be incorporated which varied the level of demand of the tasks, after Holmes, Brewin and Hennesey (2002).

In addition to exploring the relative importance of the visuo-spatial components of concurrent tasks which have been used in experiments of this nature, we can also consider the impact of performing any concurrent task during a traumatic film. There is some direct evidence to suggest that it is not the simple act of performing a concurrent task which leads to a decrease in intrusions. Hennessey (2002) has demonstrated that a concurrent verbal interference task has the opposite effect to a visuo-spatial task. In his investigation, participants watched the same traumatic video as in my study whilst counting backwards in threes from 958. He found an increase in intrusive memories for this group over the following week as compared to a control condition. This is unlikely to have been due to demand characteristics as participants predicted that the task would have the opposite effect. This is a very important finding, as it suggests that it is not some more general process such as distraction which affects how many intrusive memories are experienced over the following week

but that it is the specific content of the task participants are asked to perform during the stressful film.

Currently, Hennessey's study provides the only direct data to demonstrate an *increase* in intrusions after a concurrent task so more research needs to be conducted to replicate this result. This novel approach to examining intrusive memories is still in its infancy and requires further research for us to ensure it is the visuo-spatial elements of the concurrent task which are of critical importance. More indirect support for the dual representation interpretation of these results can be found however, in the work of Andrade, Kavanagh and Baddeley (1997). They studied the impact of a visuo-spatial tapping task on the creation of emotional visual images. Participants who were asked to form images of negative and neutral pictures rated them as less vivid and less distressing whilst they were carrying out a visuo-spatial task, compared to a non-visuo-spatial control condition. This suggests that this type of emotional memory may be dependent on visuo-spatial resources.

When we examine all this evidence together, the most parsimonious explanation for these results can be found through recourse to dual-representation theory. It is possible that another unseen effect accounts for these results, but I am unaware of a current alternative theory available to account for why a verbal distraction task would increase intrusive memories and a visuo-spatial task would decrease them.

Stressful films

It would be useful to repeat these experiments using a different stressful film to ensure the results generalise to other traumatic films, and it would also be useful to conduct an experiment using films which were not stressful as dual representation is proposed to be a model of emotional, particularly traumatic memory. Utilising a film which is

not stressful should lead to a large reduction in intrusive memories which would support the notion that it is the stressful nature of the memory that is important for the experience of distressing intrusions.

Strengths and weaknesses of a two study design in this thesis

There are advantages to having conducted this experimental investigation utilising two studies rather than one. Firstly, if I had collected data for a between-subjects design, comparing findings across hypnosis, grounding and control conditions, all of the participants would have had to have been highly hypnotisable as the dissociation induction would not work with a sample of students who were not. The recruitment of highly hypnotisable participants is extremely difficult. Only one in ten people in the population are highly hypnotisable. In my study I contacted 73 possible participants who had already been screened for hypnotisability using the Harvard scale (this takes an hour to administer) from an original participant pool of over 700 students.

Only 17 of the 73 agreed to take part in the hypnosis experiment. In order to gain enough participants to run a between subjects design I would have had to screen thousands of students. This seems to be an unnecessary use of research time when both conditions could instead be run as two studies, using a within subjects design which would increase the power of the studies considerably.

Secondly, a highly hypnotisable sample has not been used before in an experiment of this kind, and it was possible they would have a different response to the study than a random sample of students and graduates from the University of London. The grounding study was an extension of previous experimental studies using visuo-spatial tasks, and using a highly hypnotisable sample would have not allowed

comparison between this research and previous research in the field. Indeed, highly hypnotisable subjects reported intrusive memories which were of a different quality than all the participants used in previous studies and the grounding study, as half of all their intrusions were reported as thoughts rather than images. Hence, the use of two studies has allowed both an examination of a novel approach to increasing dissociation and an extension of a previous approach to decreasing it.

The disadvantage to this approach is that it makes it more difficult to interpret the findings together as using different samples then becomes a potential confounding factor.

If unlimited research time were available, a between subjects design could be used with a sample of high hypnotisables, comparing a hypnosis condition and a visuo-spatial condition with a control. Each condition should contain a minimum of 20 participants in order to be comparable with other research in this field. This would require initially screening a sample of 600 participants. However this number is likely to be substantially increased as only 23% of those previously screened in hypnotisability agreed to participate in my study. A further study could then be conducted using a 'normal' sample comparing the visuo-spatial condition with a control to ensure the results found in the first study were not confounded by hypnotisability.

Overview

There were two main aims of the studies conducted for this thesis. Firstly, to examine the relationship between dissociation and later intrusive memories of trauma. Secondly, to find a way to decrease and to increase dissociation during an analogue trauma under laboratory conditions. In the first study it was found that the use of Plasticine during an analogue trauma reduced intrusive memories over the following week as predicted. However, state dissociation was not reduced by the manipulation of Plasticine. The most parsimonious explanation for reduction in intrusions in the grounding study can be found through recourse to Brewin et al.'s Dual Representation Theory (1996).

In the second study, the manipulation of dissociation was successful as participants reported significant increases in state dissociation. Interestingly, intrusive memories of the film were not increased by the increased level of dissociation. These studies suggest that hypnosis could be an effective way to increase dissociation under laboratory conditions, but that more research needs to be conducted to ascertain how this laboratory induced dissociation may differ from dissociation that occurs spontaneously whilst experiencing a trauma.

The findings from both studies are discussed below in relation to how they might inform clinical practice, and how they are related to theoretical models. Lastly, alternative future directions for research are considered before drawing the thesis to a conclusion.

CLINICAL IMPLICATIONS: TREATMENT OF PTSD

Grounding objects

The clinical literature suggests that grounding objects should be used in the therapy room when clients are dissociating (Kennerly 1996, Linehan 1993), hence in this study it was postulated that it helped to decrease dissociation. There are important differences in how participants use the Plasticine in this experiment however. In the therapy room grounding objects may work through 'mindfulness' that is, stopping dissociation in its tracks by focusing on the present and so helping to prevent full dissociation. In this experiment participants were explicitly told to attend to the film and not to look away which may have reduced the ability of the object to prevent 'full' dissociation. It may have helped to distract the client from their internal world, however, the fact that they are being concurrently traumatised by the stressful video means there is no impact on the actual dissociation. Alternatively, the use of Plasticine as a grounding object may simply not work by decreasing dissociation. This does not necessarily decrease its possible therapeutic benefit however. Clients often experience flashbacks and the Plasticine may help them to experience less re-traumatisation as they will have less intrusive memories of that experience of being in therapy and finding it overwhelming. Indeed it may be that grounding tasks could be key during traumatic memory processing but that whilst dissociating it is simply used as a distracter, or to prevent a 'full' episode of dissociation occurring .

It is extremely useful to be able to demonstrate the efficacy of a technique used in clinical practice in laboratory conditions and to be able to explain the consequent results in terms of a theoretical model. This helps to ensure clinical practice is evidence-based. During therapeutic encounters, communication is typically verbal.

Kennerly (1996) and Linehan (1993) have suggested using grounding tasks with clients which are essentially non-verbal and have reported anecdotal success. The results of this study support their ideas, though the effect on later intrusions is present even without a decrease in dissociation during the trauma. A verbal technique which has been developed to increase client's attention (Task Concentration Training) (Bogels, Mulkens, De Long, 1997) has been found to be useful for clients when dissociating. This encourages focus on the external world, which seems to work by improving their perceived connection to their environment. It is probable that this close attention to the experience of dissociation helps to transfer more sensory memories to the VAM system. It would be useful for us to have some form of comparison between grounding techniques and verbal techniques as we have no idea of their relative efficacy. It may well be that both should be utilised to enable client's to process traumatic memories effectively.

Eye-Movement–Desensitization-Reprocessing (EMDR)

The finding that a visuo-spatial task results in a reduction in later intrusive memories may be relevant to the efficacy of EMDR. This is an integrative treatment for PTSD in which clients are asked to think of a disturbing image from their traumatic event with an associated negative cognition, and recall the bodily sensations experienced during the trauma whilst tracking a moving object in their visual field (usually the clinician's finger). This treatment has reported efficacy in randomised control trials, though it is unclear which of the different components of the therapy are active. (Chemtob,Tolin, van der Kolk & Pitman, 2001) It could be as Holmes, (2000) suggested, that the visuo-spatial tasks that are typically used in EMDR may assist in the processing of the traumatic memory. Whilst clients are processing intrusive

memories or 'flashbacks' the visuo-spatial tasks could help them to process the memory verbally whilst competing with resources within the SAM system. The visuo-spatial task will interfere with the system making it more likely that VAM processing will be used to reintegrate the memory. This would make the process of therapy less distressing for clients allowing them to stay in treatment for longer.

It is also interesting to speculate on the amount of attention devoted to the bodily sensations in this therapy. These would also be supported in the SAM system as they are primarily sensory. This may mean that EMDR would be particularly useful for clients who experience somatoform dissociation which could be assessed for using the Somatoform Dissociation Questionnaire (SDQ) (Nijenhuis et al., 1996,). A future hypothesis could be that this form of dissociation is more likely to lead to intrusions as the memory of the experience is more likely to be encoded in the SAM system.

Exposure therapy

Exposure therapy can take a number of forms, including flooding, imaginal and directed exposure. Evidence for its efficacy is very strong across a mixed variety of trauma survivors. In a review of published literature Rothbaum, Meadows, Resick and Foy, (2000), found twelve studies with strong methodological controls, eight of which had met the gold standard for clinical outcome studies, and all showed improvement after treatment.

Image habituation training (Vaughan & Tarrier, 1992)

This form of exposure involves tape-recording a narrative of the traumatic event. The aim of this technique is to modify the content of dissociation, by attending carefully to the exact sequence of perceived events during trauma. The narrative is always in the first person, and related as if it was happening, now at this very moment.

However, not all patients respond to exposure, e.g in Vaughn & Tarrier's 1992 paper, 25% of clients did not respond, perhaps because they had developed coping skills to avoid exposure to the memory (depersonalisation and derealization seem likely suspects). Sharpe, Tarrier, and Rotundo (1994), suggest that further research should be conducted to ascertain the characteristics of clients who do not respond to these treatments. They describe how they worked with a client's depersonalisation during therapy. Firstly, they performed a functional analysis of the role of dissociative symptoms in her life before providing her with alternative ways of coping, though they did not describe these in detail. They also attended to her cognitions as they observed that her dissociative symptoms increased in frequency when she was thinking of whose fault the abuse was so they introduced cognitive strategies to enable reattribution of responsibility for the abuse which helped to ameliorate the symptoms. They conclude it is essential that dissociative symptoms are addressed before exposure therapy can be effective as, if a client is very good at depersonalising, they will be able to avoid the memory entirely, i.e dissociation is formulated as a coping strategy in this case. This is an extremely important point because if clients are able to avoid the memory in this way exposure will be ineffective. Incorporating grounding objects early in exposure therapy may be very useful, in order to help clients stay with the story. These could be targeted at moments of peak dissociation, and gradually reduced over therapy sessions. This may help to prevent re-traumatisation of the client as the results of this study suggest intrusive re-experiencing would be reduced.

Cognitive-behavioural treatments

The use of cognitive-behavioural techniques is efficacious in treating PTSD (e.g. Foa, Steketee & Rothbaum 1989; Sharpe, Tarrier, & Rotundo, 1994; Ehlers & Clark , 2000, etc.) These researchers argue that exposure alone will change fear reactions, but will not alter other emotions such as shame, disgust or anger. All these researchers suggest that it is not only the physiological responses and contents of the fear memory which are important in maintaining PTSD but that the attributions of meaning to the fear memory are also critical. Ehlers & Clark, (2000) suggest that: 'PTSD becomes persistent when individuals process the trauma in a way that leads to a sense of serious current threat'. This sense of threat is proposed to arise in two ways. Firstly, as a consequence of excessively negative appraisals of the trauma and/or its sequelae and secondly, because of a disturbance of autobiographical memory characterized by poor elaboration and contextualisation, strong associative memory and strong perceptual priming. Ehlers and Clark propose that it is only by attending to client's cognitions as well as symptoms that lasting change will be brought about. This is because clients select strategies to control their symptoms and these are often meaningfully linked with the individual's appraisals of the trauma and/or its sequelae and their general beliefs about how one should cope with trauma. The strategies intended to control the threat/symptoms are often maladaptive because they may maintain PTSD by three mechanisms. Directly producing PTSD symptoms, preventing change in negative appraisals of the trauma and/or its sequelae, and preventing change in the nature of the trauma memory.

Ehlers and Clark provide the example of avoidance of social activities that were important to survivors before the traumatic event. This prevents a change in survivor's appraisals, such as 'I am a different person now', and allows them to elaborate beliefs such as 'other people would respond negatively if they knew about

the trauma'. This also prevents them from reorganizing their autobiographical memory base in a way that creates a continuous view of the self.

This approach to PTSD is very comprehensive and requires a consideration of clients functioning across all spheres of their life. What is notable, however, is the lack of attention that is paid to dissociation in this model.

The Meaning of Dissociation

The Ehlers and Clark model is very comprehensive as it endeavours to encompass all the common symptoms in PTSD. However, the belief that emotional numbing is always a result of avoidance has led to the possible link between dissociation and emotional avoidance being neglected. The experience of dissociative symptoms is often neglected by clinicians (Saxe, Van der Kolk, Berkowitz, Chinman, Hall, Lieberg and Schwartz, 1993) and if clinicians are not explicitly directed to attend to them in PTSD it is likely they will be missed. The clinician needs to attend carefully to them by assessing through measures or interview. Perhaps asking targeted assessment questions, such as: 'Did you feel as if you left your body?' This is because normalising the experiences of those suffering from PTSD will not be useful if the client does not have the opportunity to discuss all their experiences. In addition their appraisals of the dissociation itself will never be considered which may prevent lasting change in their appraisal of trauma.

In future, we must ensure all the symptom categories can be targeted, perhaps by using separate components of therapy. This kind of approach has proved extremely valuable in treating psychosis (Chadwick, Birchwood & Trower, 1996).

Measuring trait dissociation

The TDQ and DES were found not to correlate with a sample of students who were highly hypnotisable. This may have been a result of lack of statistical power as the correlation was of moderate size (r = .46). However, they did correlate on a sample of individuals who were not selected for their hypnotic suggestibility in which the *n* was only three participants more. This was a similar sample to that upon which Murray (1997) validated his sample. These correlations could be attributable to type 2 error or could suggest that those aspects of dissociation which are correlated with hypnotisability are likely to increase overall DES scores but not those of the TDQ. This is because fantasy proneness items are not included extensively throughout the TDQ but are known correlates of hypnotisability. This may suggest that the TDQ is actually a better measure for the kind of pathological dissociation we are interested in than the DES and requires further exploration.

Selection of measures to inform clinical understanding

This raises the issue of whether it is useful for clinicians to measure client's DES scores. Extreme forms of pathological dissociation are all assumed to have a traumatic etiology and yet most of the research is equivocal about how DES scores are related to past trauma. Merckelbach and Muris (2001) have raised fundamental questions about how the DES operationalises the construct of pathological dissociation. It would seem to be more useful for a clinician to only use those items termed the DES-T by Waller, Carlson and Putnam (1996) to inform their clinical practice as it is a better measure of pathological dissociation which does not include items on fantasy proneness. There are other dissociation questionnaires which have been published and it is possible these will not suffer from the same drawback as the DES

(Vanderlinden, Van Dyck, Vandereycken, Vertommen, & Verkes, 1993; Nijenhuis, Spinhoven, Van Dyck, Van der Hart, Vanderlinden, 1996). It is important that these measures are also correlated with measures of fantasy proneness and cognitive failures in order to ascertain whether they may be more appropriate measures. If these measures do not prove satisfactory an entirely new questionnaire should be created which closely follows the biological, clinical and psychometric literature, and separates dissociation into compartmentalisation and detachment as proposed by Holmes et al. (2002).

In the absence of a current appropriate measure clinicans should ensure they perform an assessment of individual symptoms of dissociation and ascertain whether the difficulties are predominantly one's of detachment, compartmentalisation or both.

Does peri-traumatic dissociation predict later intrusive memories?

The results of both studies suggest that peri-traumatic dissociation does not predict later intrusive memories. This is in direct contradiction to Holmes 2000 study who found both heart rate and self-report state dissociation to predict later intrusive memories. Recently, Merckelbach & Muris produced of critical review of the dissociation literature which casts into doubt a causal link between self-reported trauma and dissociation. They suggest, as Frankel (1996) had before them, that the view that there is a direct casual link between trauma and dissociation is attractive because of its parsimony. Studies which cite evidence that trauma causes dissociation usually rely on DES scores but these scores overlap with personality features such as fantasy proneness. These studies both show that during the films, participants report higher levels of dissociation than at baseline. If they were simply trying to conform to

experimental demand, one might have suggested that there would be a difference reported in state dissociation in the grounding study. This was not the case.
The precise nature of dissociation during trauma requires further investigation, particularly in relation to emotional numbing. We need prospective, longitudinal studies to settle the issue of causality.

Limitations to the design of this study

Whilst having a within subjects design helped to increase the power of the study by eliminating inter-subject variance, it led to one important draw-back. When participants reported their intrusive memories, if they were only thoughts or were images that were not readily locatable in the film then I was unable to attribute the memories to a condition. This means that 19 % of the grounding study and 48% of the hypnosis study was not able to be analysed. It is possible that had these been included in the final analysis, we may have found a different result, though there is no particular reason to suppose they would be reported differentially for each condition. In addition, there are sampling constraints which may limit the external validity of the findings. The majority of participants were male and were from a highly-educated, youthful population. However, there is no reason to suppose that should make a difference to their processing of traumatic memory in terms of Dual Representation Theory, and indeed we would expect higher levels of dissociation in a younger sample. Lastly, these two studies also examined mood by using simple rating scales, it is unlikely these ratings will adequately conceptualise emotional numbing, so there is a need for measures to be developed in future after the concept has been operationalised satisfactorily. The current research, has been able cast some light on

how emotions are affected drawing analogue trauma, but this research needs to be expanded and supported by measures which are valid and reliable.

Future Directions for Research

Researching Emotional Numbing

In future studies we can ensure we attempt to take better measures of emotional numbing and affect changes. One way this could be done using a similar experimental design is by videoing the participants and using a reliable system for evaluating affect such as Ekman's (1987) Facial Action Coding System (FAS). When working with a clinical population, Yates & Nasby (1993) suggest correlating emotion intensity and type with dissociative events in the room. This would help us discover which emotions are more likely to be numbed for individual clients, and possibly to demonstrate across clients which emotions are more likely to be linked with particular dissociative events.

Neurology of dissociation

This is an area which could not be explored using the current paradigm but would be very useful in helping to settle the debate about the link between self-reported dissociation and traumatic experiences. If studies were performed which could elucidate the neurology of dissociative experiences we would be in a far stronger position to comment upon the relationship between these experiences and trauma.

Brown, (1994) suggests studies with a sound methodology could be performed which measure neurological change in three ways; measuring cerebral blood flow, utilising modern brain imaging techniques, and the use of electroencephalographs.

We could then establish whether clients who have any of the dissociative disorders show differences in brain functioning compared to controls without a diagnosis who are hypnotically induced to experience a dissociative state.

Taking blood-samples of neuro-endocrine variables from clients with PTSD after Mason et al (1990) will help us to understand how they differ from controls, and whether these differences exist across the dissociative disorders. This will help clinicians decide whether PTSD should belong under the rubric of a dissociative disorder and consequently may affect the treatments which they choose to employ.

Simulating dissociation with drugs

Another way of attempting to simulate dissociation experimentally, is through the use of drugs which alter glutaminergic neurotransmission such as Ketamine.

Ketamine produces dissociative states in healthy people which suggests glutamate systems might be fundamentally implicated in producing dissociative states (Krystal, Bennett, Bremner, Southwick & Charney 1995). It should be noted that this is not believed to be dependent upon experiencing intense emotional states or memories. I however would question that conclusion as in my personal clinical experience clients have reported extreme emotional reactions to their experiences whilst on Ketamine. This was one of the reasons I was reluctant to conduct research using this drug. Another reason was that I was concerned about the ethics of conducting a study using a drug which is used to tranquillise horses.

One way of avoiding this ethical issue is by using recreational Ketamine users (Morgan & Curran, 2002). One of the difficulties with this kind of research is the same as in the hypnosis study. The participants may not catastrophise the experience as they have found it enjoyable in the past neither will they be fundamentally concerned about dying or losing control. This may not help inform us in clinical work as I suspect the clients who approach services are those who find dissociative experiences intolerable and are unable to formulate them in such a way.

Developing methodology

This is the first study to try to provide a theoretical basis for the use of a grounding technique which is used in the therapy room by examining it experimentally. The positive effects of this technique are heartening, as it provides empirical evidence for why it has been found to be effective clinically.

To the author's knowledge this is also the only study that has ever attempted to induce these symptoms of dissociation using hypnosis under laboratory conditions. The success of this manipulation has opened up a whole wealth of new and exciting avenues for future research, and may provide us with more answers about what aspects of dissociation are of most relevance in trauma. It is the sincere hope of the author that this avenue of research be continued, in order that we may learn how best to treat *all* of the symptoms that arise in PTSD and also explore other disorders that contain elements of dissociative experience.

Summary of thesis

This thesis had a number of aims; firstly there was a wish to better understand the concept of dissociation. The literature revealed confusion in the field, so this thesis attempted to specify exactly which forms of dissociation we could concentrate our research efforts upon. Peri-traumatic dissociation was highlighted as a factor of importance for PTSD and trait dissociation as measured by the DES has also been proposed to be important so both were considered in this thesis. Secondly, State dissociation was examined through devising two studies which examined whether we could increase and decrease state dissociation under laboratory conditions, through use of a grounding technique and a hypnotic suggestion. The grounding technique had no effect on self-reported dissociation but the hypnosis induction successfully increased it. Thirdly, Trait dissociation was measured and was found to have no impact upon later intrusive memories in the two studies; I argued that the measures we use to clinically assess dissociation may be inappropriate. Neither study supported the contention that peri-traumatic dissociation, in and of itself, leads to later intrusive memories, though both supported the idea that trauma increases state dissociation. The reduction in later intrusive memories for the grounding study is explained through recourse to Dual Representation Theory. The failure to increase intrusive memories in the hypnosis study can be understood in terms of a number of explanations, including; the meaning of the dissociation to the participants, artefacts of hypnosis and intrusion phenomenology. Both studies have suggested future avenues for research. Lastly, there was a need to explore the relationship between emotional numbing and dissociation, as this area is still in its infancy. The hypnosis study provided preliminary evidence to suggest they occur at the same time, which provides some support for Litzs' (1997) model of emotional numbing.

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APPENDIX 1.

Video tape commentary

Scene 1.

After a sudden rain-storm, several collisions occurred at one spot on the motorway due to the slippery conditions and bad visibility. Eight people died, and of these four died before they could be taken to hospital. Here is a 21-year old women who was trapped in her car. Unfortunately she died before she could be taken to hospital. The baby survived the accident. The parents, 26 and 30 years old, also died during the accident.

Scene 2.

Here a 58-year old man skidded onto the wrong side of the road because he was driving too fast around a corner. He hit a minibus which was coming the other way, and the occupants, a 51-year old woman and her adult daughter, were both injured. The daughter was knocked unconscious but received only cuts and bruises. By the time this video was taken, the man and the older woman, both severely injured, had been trapped in their vehicles for over an hour, since because of the remote location ambulance and fire crews took 20 minutes to reach them. The women was permanently disabled by her injuries, due to spinal cord damage, although the man did recover completely.

Scene 3.

These two men were involved in a multiple pile up on the motor way. Their wives, who were sitting in the back of the car, survived the accident although they sustained major injuries. Both men had grown up children who were still financially dependent on them.

Scene 4.

This 56-year old man and his 52-year old wife were on the way to visit their son, a student, in a near by town when their car went out of control on the motorway after one tyre was punctured. They skidded and crashed. The woman died shortly after the accident as a result of the injuries she received. The man remained conscious throughout the accident, although he had suffered extremely severe injuries. However, he was trapped in the car next to his wife and it proved too difficult to rescue him in time. He died of internal bleeding about 30 minutes after the accident, and could only be removed from the wreckage when he was already dead.

Scene 5.

This woman, a 20-year old student, and her friend, were on the way to Italy in a car during the summer. On a major road they drove straight into the rear of a traffic jam going round a blind corner. Both women were not hurt by this. However, a lorry which had they had overtaken earlier also came around the corner and hit them from behind. Both women suffered very serious injuries. The student sustained massive internal injuries, and injured skull and deep cuts to her face. The lorry driver was not hurt.

APPENDIX 2.

The State dissociation questionnaire

Please answer the following questions as you feel AT THIS MOMENT IN TIME, in this room. The following questions concern dissociation and how you feel at the moment

1.At this moment in time: Do things seem to be moving in slow motion?

not at all, slightly, moderately, considerably, extremely
0 1 2 3 4

2. At this moment in time: Do things seem to be unreal to you, as if you are in a dream?

not at all, slightly, moderately, considerably, extremely
0 1 2 3 4

3. At this moment in time: Do you have some experience that separates you from what is happening; for instance, do you feel as if you are in a movie or a play, or as if you are a robot?

not at all, slightly, moderately, considerably, extremely
0 1 2 3 4

4. At this moment in time: Do you feel as if you are looking at things from outside of your body?

not at all, slightly, moderately, considerably, extremely
0 1 2 3 4

5. At this moment in time: Do you feel as if you are watching the situation as an observer or spectator?

not at all, slightly, moderately, considerably, extremely
0 1 2 3 4

6. At this moment in time: Do you feel disconnected from your own body?

not at all, slightly, moderately, considerably, extremely
0 1 2 3 4

7. At this moment in time: Does your sense of your own body feel changed: for instance, does your own body feel unusually large or unusually small?

not at all, slightly, moderately, considerably, extremely
0 1 2 3 4

8*. At this moment in time: Would people seem motionless, dead, or mechanical?

not at all, slightly, moderately, considerably, extremely
0 1 2 3 4

9. At this moment in time: Do objects look different than you would expect?

not at all, slightly, moderately, considerably, extremely
0 1 2 3 4

10. At this moment in time: Do colours seem to be diminished in intensity ?

not at all, slightly, moderately, considerably, extremely
0 1 2 3 4

11. At this moment in time: Do you see things as if you were in a tunnel, or looking through a wide angle photographic lens?

not at all, slightly, moderately, considerably, extremely
0 1 2 3 4

12. At this moment in time: Does this experience seem to take much longer than you would have expected?

not at all, slightly, moderately, considerably, extremely
0 1 2 3 4

13. At this moment in time: Do things seem to be happening very quickly, as if there is a lifetime in a moment?

not at all, slightly, moderately, considerably, extremely
0 1 2 3 4

14. At this moment in time: Do things happen that you later cannot account for?

not at all, slightly, moderately, considerably, extremely
0 1 2 3 4

15. At this moment in time: Do you space out, or in some other way lose track of what is going on?

not at all, slightly, moderately, considerably, extremely
0 1 2 3 4

16. At this moment in time: Do sounds almost disappear or become much stronger than you would have expected?

not at all, slightly, moderately, considerably, extremely
0 1 2 3 4

17. At this moment in time: Do things seem to be very real, as if there is a special sense of clarity?

not at all, slightly, moderately, considerably, extremely
0 1 2 3 4

18. At this moment in time: Does it seem as if you are looking at the world through a fog, so that people or objects seem far away or unclear?

not at all, slightly, moderately, considerably, extremely
0 1 2 3 4

19. At this moment in time: Do colours seem much brighter than you would have expected?

not at all, slightly, moderately, considerably, extremely
0 1 2 3 4

* The wording was changed for item 8 from "Do people seem motionless, dead or mechanical" to "Would people seem motionless, dead or mechanical", as the participant was alone for three administrations.

APPENDIX 3.

Confidential

PDEQ

Instructions: please complete the items below by circling the choice that best describes your experience and reactions during the _____ and immediately afterwards. If an item does not apply to your experience, please circle "Not at all true".

1. I had moments of losing track of what was going on – I "blanked out" or "spaced out" or in some way felt that I was not part of what was going on.

1	2	3	4	5
Not at all true	Slightly true	Somewhat True	Very true	Extremely true

2. I found that I was on "automatic pilot" – I ended up doing things that I later realised I hadn't actively decided to do.

1	2	3	4	5
Not at all true	Slightly true	Somewhat True	Very true	Extremely true

3. My sense of time changed – things seemed to be happening in slow motion.

1	2	3	4	5
Not at all true	Slightly true	Somewhat True	Very true	Extremely true

4. What was happening seemed unreal to me, like I was in a dream or watching a movie or play.

1	2	3	4	5
Not at all true	Slightly true	Somewhat True	Very true	Extremely true

5. I felt as though I were a spectator watching what was happening to me, as if I were floating above the scene or observing it as outsider.

1	2	3	4	5
Not at all true	Slightly true	Somewhat True	Very true	Extremely true

6. There were moments when my sense of my body seemed distorted or changed. I felt disconnected from my body, or that it was unusually large or small.

1	2	3	4	5
Not at all true	Slightly true	Somewhat True	Very true	Extremely true

7. I felt as though things that were actually happening to others were happening to me – like I was being

trapped when I really wasn't.

1	2	3	4	5
Not at all true	Slightly true	Somewhat True	Very true	Extremely true

8. I was surprised to find out afterwards that a lot of things had happened at the time that I was not aware of, especially things I ordinarily would have noticed.

1	2	3	4	5
Not at all true	Slightly true	Somewhat True	Very true	Extremely true

9. I felt confused; that is, there were moments when I had difficulty making sense of what was happening.

1	2	3	4	5
Not at all true	Slightly true	Somewhat True	Very true	Extremely true

10. I felt disorientated; that is, there were moments when I felt uncertain about where I was or what time it was.

1	2	3	4	5
Not at all true	Slightly true	Somewhat True	Very true	Extremely true

APPENDIX 4.

Dissociative Experiences Scale II (DES II)

Name: _____

Date: _____ Age: _____ Sex: M F

This questionnaire consists of 28 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% (never) 10 20 30 40 50 60 70 80 90 100% (always)

---

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%

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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 5.

The Trait Dissociation Questionnaire (TDQ)

The following questions are concerned with how often people have certain experiences. Please read each question carefully, but do not spend too much time on each one. Respond to each question by pressing a number key in the range from 0 to 5. (For example, if you OFTEN find yourself doing things without knowing why, press key 3 at the first question). Remember there are no right or wrong answers.

We are interested in your personal experience IN GENERAL.(in general - i.e. NOT just at this moment in time). press SPACE when ready to start

1. I find myself doing things without knowing why.

never	rarely	sometimes	often	mostly	always
0	1	2	3	4	5

2. I cannot get angry about the things that should annoy me.

never	rarely	sometimes	often	mostly	always
0	1	2	3	4	5

3. I do many things which I regret afterwards.

never	rarely	sometimes	often	mostly	always
0	1	2	3	4	5

4.I feel that I am more than one person.

never	rarely	sometimes	often	mostly	always
0	1	2	3	4	5

5. I feel as if other people live in a different world.

never	rarely	sometimes	often	mostly	always
0	1	2	3	4	5

6. I feel that my mind is divided.

never	rarely	sometimes	often	mostly	always
0	1	2	3	4	5

7. I can't understand why I get so cross and grouchy.

never	rarely	sometimes	often	mostly	always
0	1	2	3	4	5

8. I feel distant from my own emotions.

never	rarely	sometimes	often	mostly	always
0	1	2	3	4	5

9. I don't know how to stop myself from doing something.

never	rarely	sometimes	often	mostly	always
0	1	2	3	4	5

10. I have problems remembering important details of stressful events.

never	rarely	sometimes	often	mostly	always
0	1	2	3	4	5

11. I have conflicting desires.

never	rarely	sometimes	often	mostly	always
0	1	2	3	4	5

12. I feel as if I am standing next to myself or watching myself do something and I actually see myself do something and I actually see myself as if I were looking at another person.

never	rarely	sometimes	often	mostly	always
0	1	2	3	4	5

13. I feel unable to think straight.

never	rarely	sometimes	often	mostly	always
0	1	2	3	4	5

14. I feel emotionally numb (e.g. feel sad but can't cry, unable to have loving feelings).

never	rarely	sometimes	often	mostly	always
0	1	2	3	4	5

15. I feel that I am floating beside my body, and watching it from "outside".

never	rarely	sometimes	often	mostly	always
0	1	2	3	4	5

16. I feel that my personality is split into distinct parts.

never	rarely	sometimes	often	mostly	always
0	1	2	3	4	5

17. I find it difficult to feel real emotions, such as pain, happiness, sadness or anger.

never	rarely	sometimes	often	mostly	always
0	1	2	3	4	5

18. I feel that other people, objects, and the world around me are not real.

never	rarely	sometimes	often	mostly	always
0	1	2	3	4	5

19. I find it difficult to respond to others in a sympathetic way.

never	rarely	sometimes	often	mostly	always
0	1	2	3	4	5

20. Things seem to go by faster or slower than they really do.

never	rarely	sometimes	often	mostly	always
0	1	2	3	4	5

21. I find myself dressed in clothes that I don't remember putting on

never	rarely	sometimes	often	mostly	always
0	1	2	3	4	5

22. I find myself in a place and have no idea how I got there.

never	rarely	sometimes	often	mostly	always
0	1	2	3	4	5

23. I find new things among my belongings that I do not remember buying.

never	rarely	sometimes	often	mostly	always
0	1	2	3	4	5

24. My moods can really change.

never	rarely	sometimes	often	mostly	always
0	1	2	3	4	5

25. I find writings, drawings, or notes among my belongings that I must have done but cannot remember doing.
never rarely sometimes often mostly always0 1 2
3 4 5

26. I have no memory for some important events in my life(for example, a wedding or graduation).never rarely sometimes often mostly always
0 1 2 3 4 5

27. I live in a world of my own where no one can reach me.
never rarely sometimes often mostly always
0 1 2 3 4 5

28. I look at my watch and am surprised at the time it shows.
never rarely sometimes often mostly always
0 1 2 3 4 5

29. My memory of upsetting events is patchy.
never rarely sometimes often mostly always
0 1 2 3 4 5

30. I say things without meaning to.
never rarely sometimes often mostly always
0 1 2 3 4 5

31. I underestimate or overestimate the amount of time that has passed.
never rarely sometimes often mostly always
0 1 2 3 4 5

32. If something upsetting happens, I find it difficult to remember afterwards.
never rarely sometimes often mostly always
0 1 2 3 4 5

33. I feel like I don't belong.
never rarely sometimes often mostly always
0 1 2 3 4 5

34. The world seems unreal or strange.
never rarely sometimes often mostly always
0 1 2 3 4 5

35. I am unable to ignore pain.
never rarely sometimes often mostly always
0 1 2 3 4 5

36. I feel that there are two of me.
never rarely sometimes often mostly always
0 1 2 3 4 5

37. I feel distant and cut off from others around.
never rarely sometimes often mostly always
0 1 2 3 4 5

38. I have difficulty concentrating.
never rarely sometimes often mostly always
0 1 2 3 4 5

APPENDIX 6.

Mood Ratings.

The next ten questions concern your mood. Please circle the number that best describes how you feel *Now*, at this moment in time. Try to answer quickly without thinking too long.

1. Please indicate how happy you currently feel.
0 1 2 3 4 5 6 7 8 9 10
(0= not at all happy) (10= extremely happy)

2 Please indicate how anxious you currently feel.
0 1 2 3 4 5 6 7 8 9 10
(0= not at all anxious) (10= extremely anxious)

3. Please indicate how depressed you currently feel.
0 1 2 3 4 5 6 7 8 9 10
(0= not at all depressed) (10= extremely depressed)

4. Please indicate how angry you currently feel.
0 1 2 3 4 5 6 7 8 9 10
(0= not at all angry) (10= extremely angry)

5. Please indicate how fearful you currently feel.
0 1 2 3 4 5 6 7 8 9 10
(0= not at all fearful) (10= extremely fearful)

6. Please indicate how horrified you currently feel.
0 1 2 3 4 5 6 7 8 9 10
(0= not at all horrified) (10= extremely horrified)

7. Please indicate how helpless you currently feel.
0 1 2 3 4 5 6 7 8 9 10
(0= not at all helpless) (10= extremely helpless)

8. Please indicate how disgusted you currently feel.
0 1 2 3 4 5 6 7 8 9 10
(0= not at all disgusted) (10= extremely disgusted)

9 Please indicate how ashamed you currently feel.
0 1 2 3 4 5 6 7 8 9 10
(0= not at all ashamed) (10= extremely ashamed)

10. Please indicate how guilty you currently feel.
0 1 2 3 4 5 6 7 8 9 10
(0= not at all guilty) (10= extremely guilty)

APPENDIX 7.

Attention and experimental demand questions

Please indicate how much attention you paid to the film you have just seen on the scale below:

1 2 3 4 5 6 7 8 9 10

Please indicate how much attention you paid to the task who were asked to achieve during the film you have just seen on the scale below:

1 2 3 4 5 6 7 8 9 10

On the scale below, please indicate how much you would predict that the task you have been asked to perform during the film (hypnosis/plasticine manipulation) would increase or decrease your intrusive memories over the following week:

-1 -2 -3 -4 -5 -6 -7 -8 -9 -10 0 1 2 3 4 5 6 7 8 9 10

APPENDIX 8

CONFIDENTIAL

INSTRUCTIONS FOR DIARY OF INTRUSIVE MEMORIES

(Please try to keep this diary: it is vital for the experiment. THANKYOU!)

Volunteer number:..... Date:..... Experimenter and their contact details.....
(the experiment will fill in the day and date for each sheet in your diary)

******************Date, day and time of follow-up:.....*******************

* If over the next week you experience any **spontaneously occurring intrusions** about the film you have just watched, I would be very grateful if you could note them down in the diary. By **"intrusions"** I mean intrusive memories of the video that suddenly pop into mind spontaneously. I do not mean times when you deliberately think about it or mull it over. Intrusions may take the form of pictures of the film you have just seen. You may find it useful to set aside a certain time each day when you can fill in the diary.

* Please record the date of each intrusion (Box 1), whether it was primarily an image or a thought (Box 2) and what the intrusion was of (Box 3). Also:

- ☐ Fill in the boxes on level of distress, "nowness", sensory detail (i.e. vividness) and automacy (i.e. spontaneity) that accompany each intrusion by entering a number between zero and one hundred that reflects your experience.
- ☐ **Please note: 0 = not at all; 50 = moderately; 100 = extremely.**

* Please use one diary sheet per day. If you cannot fit all the intrusions for one time of day into the space provided please continue on another sheet.

* If you are on occasion unable to record details, please make sure you note that an intrusion has occurred and the date.

* IF YOU HAVE NO INTRUSIONS PUT ZERO (0) FOR THAT TIME OF DAY **Thank you for your help.**

DIARY OF INTRUSIONS (Please try to keep this diary: it is vital for the experiment. THANK YOU!)

Volunteer number:..... Day 1: day of week:..... date:.....

TIME OF DAY (if you cannot fit in all intrusions please use reverse side of the paper)	**NUMBER** of intrusions (of each type)	Was the intrusion an IMAGE (I) THOUGHT (T) or BOTH (IT)?	**CONTENT: What was each intrusion of (please describe briefly):**	How **DISTRESSED** were you by the intrusion (0 = not at all, 100 = extremely)	How much did it feel as if you were experiencing the event again **NOW** during the intrusion (0 = not at all, 100 = extremely)	How **VIVID** was the intrusion (ie how rich in sensory detail)? (0 = not at all, 100 = extremely)	How **AUTOMATIC** / OR SPONTANEOUS did it feel (ie how much did it pop into your head without you deliberately thinking about it? (0 = not at all, 100 = extremely)
MORNING if no intrusions put '0'							
AFTERNOON if no intrusions put '0'							
EVENING if no intrusions put '0'							
NIGHT if no intrusions put '0'							

APPENDIX 9.

The Cued Recall Memory Test.

Please answer these questions about the film you watched last week.
The questions are difficult so don't worry if you're not sure, just put down your best guess.

1. What colour was the car that was on fire in a field, by a tree, at the beginning of the first scene?

2. What part of a body did you sticking out of the upside down car in the first scene?

3. What was in the blanket that the man wearing the cap and long coat was carrying at the end of the first scene?

4. What colour was the t-shirt worn by the middle-aged woman trapped in the mini-bus in scene two?

5. When the woman was finally cut out of the mini-bus and placed on a stretcher, which part/s of her body was cut and bleeding.

6. In scene two, once they got the man out of the car onto the stretcher, what did they do to him?

7. What part of the injured man's body was zoomed in on in scene two?

8. In scene three, a body was still in a car covered by a stripy blanket what body part did you see hanging out from under the blanket?

9. What kind of vehicle had the mangled car from the above question crashed into?

10. In scene four, what colour was the car that had its roof cut off in order to remove the dead?

11. How many doctors in white coats were shown at the scene of the accident in scene four?

12. How many people were put in coffins in scene four?

13. In the final scene, what was the female student receiving medical attention wearing?

14. In the final scene what part of the female student's body was bandaged by the paramedics?

15. Can you remember any other medical procedures that were performed on the injured girl?

APPENDIX 10.

Recognition Memory Test.

For each statement please indicate whether you believe the event occurred in the film by answering Yes or No.

Scene 1.

a) The baby in the blanket is passed to a paramedic and placed in an ambulance.
b) An upside down car is focused on and a paramedic manipulates a naked leg which is sticking out.
c) A team of fireman race to a car that is on fire and spray foam on it in order to quench the flames.

d) A distraught teenager is led away from the scene by a member of the public.

e) Three members of the public help the emergency personnel carry a body to the side of the road.

Scene 2.

a) A woman being cut out of a crashed vehicle cries out, and appears to lose consciousness

b) When the man with the injured leg is on the stretcher the paramedics shine a light into his eyes.

c) A team of fireman attach metal equipment to the front of the minibus to pull the wreckage away from the woman's legs.

d))A policeman stands watching the wreckage whilst making notes on a clipboard.

e) When the man with the injured leg is on the stretcher the paramedics cut his trousers and reveal a bloody wound.

Scene 3.

a) A body which had been covered by a blanket inside a wrecked car is removed, and placed on the ground, two blankets are then laid over it.

b) Rescue workers put up a yellow and blue police incident tape in order to keep the crowd back from the scene.

c) Before covering a man's body with a blanket, the fireman closes the man's eyes.

Scene 4

a) Emergency personnel use cutting equipment to remove the body of a man from a beige car who has been crushed in the driver's seat.

b) A fireman struggles to release the trapped woman's seatbelt.

c) A bent car number plate lies on the ground close to coffin the man is placed in.

d) Two men lift up two bodies and bundle them into metal coffins.

Scene 5

a) A female student is moaning as she is treated in an ambulance. She is naked and electrodes are attached to her chest.

b) A paramedic injects the female student in her right arm, whilst the others attend to her injuries.

c) As her head is bandaged, a relative arrives at the ambulance and is kept to one side by paramedics.

APPENDIX 11.

RESPONSE BOOKLET – FORM A

HARVARD GROUP SCALE

OF

HYPNOTIC SUSCEPTIBILITY

By Ronald E. Shor and Emily Carota Orne (modified)

The Scale is a standard procedure for estimating susceptibility to hypnosis. An individual's susceptibility to hypnosis may change, however, over time and with differing circumstances. An individual who appears relatively unsusceptible at this time by these standard procedures will not necessarily still be relatively unsusceptible at a later time or under different circumstances.

PLEASE SUPPLY THE INFORMATION REQUESTED BELOW

Name: _____ Date: _____

Age: _____ Sex: _____ Department: _____

e-mail address: _____

Have you ever been hypnotized? Circle: Yes No
If so, please cite the circumstances and describe your experiences. Please be brief:

DO NOT OPEN THIS BOOKLET until the examiner specifically instructs you to do so

Please write down now briefly in your own words a *list* of the things that happened since you began looking at the target. Do *not* go into detail. Spend three minutes, no longer, in writing your reply.

DO NOT TURN THIS PAGE *until the examiner specifically instructs you to do so*

PLEASE DO NOT RETURN TO PAGE 2

On this page write down a list of anything else that you now remember that you did not remember previously. Please do *not* go into detail. Spend two minutes, no longer, in writing out your reply.

Please **DO NOT TURN THIS PAGE** *until the examiner specifically instructs you to do so*

SECTION ON OBJECTIVE, OUTWARD RESPONSES

Listed below in chronological order are the eleven specific happenings which were suggested to you during the standard hypnotic procedure. We wish you to estimate whether or not you *objectively* responded to these eleven suggestions, that is, whether or not *an onlooker* would have observed that you did or did not make certain definite responses by certain specific, predefined criteria. In this section we are thus interested in your estimates of your *outward behavior* and *not* in what your *inner, subjective experience* of it was like. Later on you will be given an opportunity to describe your inner, subjective experience, but in this section refer only to the outward behavioral responses irrespective of what the experience may have been like subjectively.

It is understood that your estimates may in some cases not be as accurate as you might wish them to be and that you might even have to guess. But we want you to make whatever you feel to be your *best estimates* regardless.

Beneath a description of each of the eleven suggestions are sets of two responses, labeled A and B. Please *circle* either A or B for each question, whichever you judge to be the more accurate. Please answer *every* question. Failure to give a definite answer to every question may lead to disqualification of your record.

I. HEAD FALLING

You were first told to sit up straight in your chair for 30 seconds and then to think of your head falling forward. Would you estimate that *an onlooker* would have observed that your head fell forward at least two inches during the time you were thinking about it happening?

Circle one: A. My head fell forward at least two inches.

B. My head fell forward less than two inches.

II. EYE CLOSURE

You were next told to rest your hands in your lap and pick out a spot on either hand as a target and concentrate on it. You were then told that your eyelids were becoming tired and heavy. Would you estimate that *an onlooker* would have observed that your eyelids had closed (before the time you were told to close them deliberately)?

Circle one: A. My eyelids had closed by then.

B. My eyelids had *not* closed by then.

III. HAND LOWERING (LEFT HAND)

You were next told to extend your left arm straight out and feel it becoming heavy as though a weight were pulling the hand and arm down. Would you estimate that *an onlooker* would have observed that your hand lowered at least six inches (before the time you were told to let your hand down deliberately)?

Circle one: A. My hand had lowered at least six inches by then.

B. My hand had lowered less than six inches by then.

IV. ARM IMMOBILIZATION (RIGHT ARM)

You were next told how heavy your right hand and arm felt and then told to try to lift your hand up. Would you estimate that *an onlooker* would have observed that you did *not* lift your hand and arm up at least one inch (before you were told to stop trying)?

Circle one: A. I did *not* lift my hand and arm at least one inch by then.

B. I did lift my hand and arm an inch or more by then.

V. FINGER LOCK

You were next told to interlock your fingers, told how your fingers would become tightly interlocked, and then told to try to take your hands apart. Would you estimate that *an onlooker* would have observed that your fingers were incompletely separated (before you were told to stop trying to take them apart)?

Circle one: A. My fingers were still incompletely separated by then.

B. My fingers had completely separated by then.

VI. ARM RIGIDITY (LEFT)

You were next told to extend your left arm straight out and make a fist, told to notice it becoming stiff, and then told to try to bend it. Would you estimate that *an onlooker* would have observed that there was less than two inches of arm bending (before you were told to stop trying)?

Circle one: A. My arm was bent less than two inches by then.

B. My arm was bent two or more inches by then.

VII. MOVING HANDS TOGETHER

You were next told to hold your hands out in front of you about a foot apart and then told to imagine a force pulling your hands together. Would you estimate that *an onlooker* would have observed that your hands were not over six inches apart (before you were told to return your hands to their resting position)?

Circle one: A. My hands were not more than six inches apart by then.

B. My hands were still more than six inches apart by then.

VIII. COMMUNICATION INHIBITION

You were next told to think how hard it might be to shake your head to indicate "no", and then told to try. Would you estimate that *an onlooker* would have observed you to make a recognizable shake of the head "no"? (That is, before you were told to stop trying.)

Circle one: A. I did *not* recognizably shake my head "no".

B. I did recognizably shake my head "no".

IX. EXPERIENCING OF FLY

You were next told to become aware of the buzzing of a fly which was said to become annoying, and then you were told to shoo it away.Would you estimate that *an onlooker* would have observed you make any grimacing, any movement, any outward acknowledgement of an effect (regardless of what it was like subjectively)?

Circle one: A. I did make some outward acknowledgement.

B. I did *not* make any outward acknowledgement.

X. EYE CATALEPSY

You were next told that your eyelids were so tightly closed that you could not open them, and then you were told to try to do so. Would you estimate that *an onlooker* would have observed that your eyes remained closed (before you were told to stop trying)?

Circle one: A. My eyes remained closed.

B. My eyes had opened.

XI. POST-HYPNOTIC SUGGESTION (TOUCHING RIGHT EAR)

You were next told that after you were awakened you would hear a tapping noise at which time you would reach up and touch your right ear. You were further informed that you would do this but forget being told to do so. Would you estimate that *an onlooker* would have observed either that you reached up and touched your right ear, or that you made any partial movement to do so?

Circle one: A. I made at least an observable partial movement to touch my right ear.

B. I did *not* make even a partial movement to touch my right ear, which would have been observable.

CONTINUE ON NEXT PAGE

YOU MAY NOW REFER TO EARLIER PAGES –
BUT PLEASE DO NOT WRITE ANYTHING FURTHER ON THEM

SECTION ON INNER, SUBJECTIVE EXPERIENCES

(1) Regarding the suggestion of EXPERIENCING A FLY—how real was it to you? How vividly did you hear and feel it? Did you really believe at the time that it was there? Was there any doubt about its reality?

(2) Regarding the two suggestions of HAND LOWERING (LEFT) and HANDS MOVING TOGETHER—was it subjectively convincing each time that the effect was happening entirely by itself? Was there any feeling either time that you were helping it along?

(3) On the remainder of this page please describe any other of your inner, subjective experiences during the procedure which you feel to be of interest.

THANK YOU FOR YOUR COOPERATION

APPENDIX 12.

THE HYPNOSIS INDUCTION

In order to perform the hypnotic induction participants were asked give details to Dr. Oakley about how they would like to enter a hypnotic state. All participants began the induction in a garden and were asked if they would like to leave the garden by going down in a lift or by walking down the stairs. They were then asked to choose a 'special place' for themselves where they felt safe and happy. This could be a real place they had been to or one from their imagination. They were asked to give as many perceptual cues as possible to the hypnotist so that he could evoke the situation realistically. For example, if a participant was sitting by the sea, he would be asked what he could smell, hear, see, and feel. Knowing that the participant could see and smell the sea, feel the wind on their face, and hear a curlew cry, helped Dr. Oakley to give suggestions to evoke the scene. This technique has been recommended by Degun-Mather, Walters and Oakley (2000).

HYPNOSIS SCRIPT

Please note, participants in Condition one received the B section instructions followed by A, in condition two, they received A section instructions followed by B.

A. No dissociation induction.

"Stay as hypnotized as you are now with your eyes closed - imagine that you are looking at a television screen, and begin to have the experience of the screen in front of you. Watching it normally from your own perspective [any feelings of unreality gone [This was checked with the participant]. In a few moments I will ask you to open your eyes in order to watch the film. Stay as hypnotized as you are now, open your eyes and watch the film." [*Dr. Oakley took care not to suggest that the participants were to feel relaxed during the film*)

Then the first stressful film was shown.

When the video ended participants were instructed to: 'Please close your eyes now — and return to your special place.'

Each participant was given some personal reminders of their own special place.

If participants had already received the dissociation induction, the hypnosis ended here, if not, the instructions below were performed.

B. Dissociation Induction.

Stay as hypnotized as you are now with your eyes closed - imagine that you are looking at a television screen and begin to have the experience of the screen in front of you. [*this was checked with the participant*] As you do that, begin to have the experience of looking at the screen but of seeing it from a different perspective as though you are viewing it from outside your own body — from a different point of view — looking at the screen and being aware of yourself looking at the screen almost as though you were another person ... being aware of the screen and being aware of yourself watching it. As you continue to look at the screen, everything around you beginning to seem strange and unreal as though you were somehow another person in a strange place. When you begin to have that feeling of being outside yourself and of the screen and surroundings being unfamiliar nod/raise a finger on your right hand to let me know

— [suggestions were continued until the signal was received] ....

Good, just let those feelings of being outside yourself as you watch the screen and of the screen and your surroundings being unfamiliar and unreal get stronger and clearer until they are as strong as they can be for you just now. *[This suggestion was continued, then a head nod or finger movement was requested to signal participants felt the feeling were as strong as they could be].* In a few moments I will ask you to open your eyes in order to watch the film. When you open your eyes continue to have those feelings as you watch what is shown on the screen - being fully aware of the events taking place in the film - watching what happens as though you are viewing it from outside your own body ... what is shown on the screen feeling strange and unreal as though you were someone else watching what is happening - all the time paying full attention to what is being shown on the screen whilst watching it from another perspective ... Continue to have these feelings for the whole time you watch the film until you are given different instructions. . Stay as hypnotized as you are now, open your eyes and watch the film.
The hypnotist remained silent as the participant watched the film. After it ended he removed the suggestion and returned the participant to their special place:

Please close your eyes now – returning to normal feelings, experiencing the world from your own perspective, everything as real and as normal as it should (checked with participant) Return now to your special place.

The hypnosis was then brought to a close or the second film was watched.

APPENDIX 13.

Induction Film Visual Analogue Scale. **Participant No:** X

Please indicate how strongly you felt by making a vertical pencil mark on the line.

When you were told to 'observe yourself' looking at the film, how strong was that feeling?

0 ——————————————————— 100

I didn't get that feeling at all — The feeling was very strong indeed

When you were told you would experience looking at the film 'as if it were happening to someone else', how strong was that feeling?

0 ——————————————————— 100

I didn't get that feeling at all — The feeling was very strong indeed

When you were told you would experience the film and the world around you as 'strange and unreal', how strong was that feeling?

0 ——————————————————— 100

I didn't get that feeling at all — The feeling was very strong indeed

Control Film Visual Analogue Scale. **Participant No:**

When you were asked to view the film as you normally would, how strong was the feeling of 'observing yourself'?

0 ——————————————————————— 100

I didn't get that feeling at all

The feeling was very strong indeed

When you were asked to view the film as you normally would, how strong was the feeling of 'looking at the film as if it was happening to someone else'.

0 ——————————————————————— 100

I didn't get that feeling at all

The feeling was very strong indeed

When you were told to view the film as you normally would, how strong was the feeling that the 'world around you was strange and unreal'?

0 ——————————————————————— 100

I didn't get that feeling at all

The feeling was very strong indeed

APPENDIX 14.

Participant Number	Self-Report of how the induction felt
1& 2	Only the ratings were used for the first two participants.
3	It was too strange – I've never felt anything like it. I was crouched on the small filing cabinet across the way (to the left of him). I wasn't there, I was in the chair and then there I was. I was there for most of the video but I went back to the person in the chair before the video ended.
4	I didn't really feel as if I was outside myself at all, but I did somehow feel as if I were someone else. The whole experience felt unreal, as if I wasn't there, also my feet felt really big- what was all that about?
5	My ability to observe myself diminished at time went on. When I was observing me I still knew exactly where I was and what I was feeling. Sounds felt indistinct, maybe that's because all my previous hypnosis has been about seeing things and not hearing things that much
6	In the first video I felt really strange; like the lights were on and nobody was in. I felt as though I wasn't me.I felt as though I was viewing it from outside. I still felt rather disconnected for the second video, but not in quite the same way. (the first video was the induction for this participant)
7	It didn't seem completely effective, for moments I was outside my body but then I was back in again, It wasn't easy but it took less effort over time, I felt like I was concentrating a lot on the first one (i.e. first scene of induction video)but it was easier for the others .
8	I can't really say, I didn't feel like me, that's all.
9	I felt more hypnotised than I have before, I felt very relaxed, during the induction I felt really tall and as though I was above my body. The feeling lingered after the video ended, but opening my eyes again got rid of it and it had completely gone5-10 seconds into the next video.
10	Odd, it was tricky at first, to see yourself. It 'clicked' during the introduction and I remained outside throughout the video. It seemed more depressing than the first one.
11	I felt like I was watching myself, I imagined myself at the door and watching myself and you two. Sometimes it went too but it was there most of the time.
12	I felt like I didn't blink at all, I'm sure I didn't; I just stared at the screen. It felt like being stoned, like letting go and giving up control. I didn't end up with a third person eye-view, it was more of an internal state. It's hard to explain. I felt like I was to the right and to the back of myself.
13	It wasn't easy to imagine myself as not myself. I could sort of see me. I felt less involved and interested than the other video. I was watching and feeling it should be a lot more distressing than they actually were. I tried to imagine that I was standing behind the chair.

Participant Number	Self-Report of how the induction felt
14	Occasionally I could see myself sitting to my right. I felt slightly tense in my shoulders. I saw my heartbeat increase but it wasn't as though I was watching myself- I could sense myself watching myself from the other view and I could see what I was watching. I mean, I felt as though I was outside myself watching it but as though I was still me watching it. I keep switching in between the two, every four minutes or so (the whole video was only 8 minutes long) I felt like when I was watching me I wasn't watching the video.
15	It felt weird, you are watching it, but not as yourself as someone else. I didn't really understand what was happening, I couldn't take it in, connect, or make it out. The colours were also really weird in the second film (the induction video). They were lighter and more foggy. I saw my self watching the video from above and making sickened expressions- Yuck and nasty!
16	Physically I felt different – all shivery but not as though I could see me – I had no image of that, rather I was watching the film separately from my body, not really perceiving myself at all. In that, I was attending more to the film but I had a lack of awareness of my physical body in general.
17	I kinda thought I was over there (gesticulated to his right) looking at you guys. But I thought it was weird; I'm not there I'm in the chair! Why am I am there when I'm sat over here? I was watching someone else but that someone else was wearing my clothes. During the second video (the induction video) it didn't seem half as bad, the people in it were just actors and it didn't seem as half as gruesome.

APPENDIX 15.

CONFIDENTIAL

CONSENT FORM.

Study Title: Dissociation at the time of trauma and subsequent intrusive memories.
Investigators: Ailsa Stuart. Trainee Clinical Psychologist.
Emily Holmes. Chartered Clinical Psychologist.
Sub-Department Of Clinical Health Psychology.

Please read this form carefully and only sign it if you agree with ALL the statements. If you are unclear about any aspect of the experiment, please ask the experimenter for further clarification.

I have read the information sheet about this study, which is a psychology experiment studying the effects of trauma.
I have had an opportunity to ask questions and discuss this study.
I have received satisfactory answers to all my questions.
I have received enough information about this study
I understand that I am free to withdraw from this study :
at any time
without giving a reason for withdrawing.
I have not had treatment for any previous mental health problem.
I have not taken part in a similar experiment.
I understand that the experimenter may call me to remind me of the follow up session. If for any reason I do not attend, I agree that the experimenter may contact me.

Do you agree to take part in this study?
Yes/No

Date:
Signature of participant:
Name of participant:
Address:

Telephone number:
E-mail address:
Signature of Experimenter:

Date of follow-up:

APPENDIX 16.

CONFIDENTIAL PARTICIPANT INFORMATION FORM.

Study Title: Dissociation at the time of trauma and subsequent intrusive memories.

Investigators: Ailsa Stuart. Trainee Clinical Psychologist.
Emily Holmes. Chartered Clinical Psychologist.
Chris Brewin. Professor of Clinical Psychology

- The experiment in which you are invited to take part is concerned with how people respond to trauma, and any subsequent memories they may develop. It is hoped that studying volunteers during an analogue trauma will help us understand more about how and why people often have intrusive memories after a real-life traumatic event.
- During your first session, you will be required to watch a distressing video, containing graphic scenes of the aftermath of road traffic accidents, including seriously injured and dead people. You may spontaneously think about this after the film and may be distressed by it. Intrusive recollections may take the form of visual images, thoughts or mood changes. Your experimenter has explained that in previous research using this film no long standing emotional responses have been reported, but this does not mean there is zero risk to you. You will also be required to complete questionnaires about your state of mind and mood before and after the film.
- Before watching the film, some participants will be given a form of hypnotic induction which has been designed specifically for this experiment and will be removed at the end of the film. Whether you are a Participant who is given this induction will be completely random.
- For the week following the experiment you will be required to keep a simple 'diary' of any spontaneous intrusions/ memories about the film. You will return in a weeks time for a follow-up session when you will be asked about the film and any effects it had upon you. You will then be debriefed and given a chance to discuss any aspects of the study you may wish to. The experimenter may call you to remind you of this follow-up session.
- All your responses will be kept strictly confidential.
- You can get in touch with the experimenter at any point during or after the study if you experience difficulties. Her contact number is 07970 476839
- You do not have to take part in this study if you do not want to. If you decide to take part you may withdraw at any time without having to give a reason. Your withdrawal will be kept confidential and will in no way effect your treatment by the university.
- All proposals for research using human subjects are reviewed by an ethics committee before they can proceed. This proposal was reviewed by the Joint UCL/UCLH Committees on the ethics of Human Research.

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The University College London Hospitals

The Joint UCL/UCLH Committees on the Ethics of Human Research

Committee Alpha Chairman: Professor A McLean

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Professor C Brewin
Professor of Clinical Psychology
UCL
Sub-department of Clinical Health Psychology
Gower Street

April 24, 2001

Dear Professor Brewin

Study No: **01/0063** *(Please quote in all correspondence)*
Title: **Dissociation during trauma and subsequent intrusive memories**

Thank you very much for your letter dated April addressing the points raised by the Committee at their last meeting on 5th April. There are no further objections on ethical grounds and the study can go ahead.

Please note that it is important that you notify the Committee of any adverse events or changes (name of investigator etc) relating to this project. You should also notify the Committee on completion of the project, or indeed if the project is abandoned. **Please remember to quote the above number in any correspondence.**

Yours sincerely

pp

Professor André McLean, BM BCh PhD FRC Path
Chairman

cc. Dr E Holmes

/iin/April 24. 2001

APPENDIX 18.

Treatment of outliers

In study one, three scores were designated real outliers as they were more than three standard deviations from the mean. They were changed by substituting the next highest score for that measure and adding one. In study two, two scores were designated real outliers as they were more than three standard deviations from the mean. One was changed by using the same principle as above. The other was excluded as the participant also had missing data for the same measure in a different condition.

Study	*Participant number*	*Condition*	*Measure*	*Outlier Score*	*Changed Score*
Grounding	17	Grounded	Mood ratings total	72	54
Grounding	4	Grounded	Total number of intrusions	6	4
Grounding	4	Grounded	Total number of days with intrusions	3	2
Hypnosis	2	Pre-video	CADSS	29	excluded
Hypnosis	15	Not applicable	DES	48.21	24.21