Is That my Memory? Effects of Interpersonal Relationships on Shared Memory

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Abstract

This thesis documents the results of a research project investigating the relationship between interpersonal relationship factors and shared memory. Although shared memory and the factors that influence it have been researched more in recent years, there has been limited research which has measured the specific influence of interpersonal factors such as familiarity, trust, confidence, and memory esteem on memory distortion, specifically memory conformity and false memory. The research presented in this thesis sought to fill the void in the shared memory literature and also proposed new use of image recording technology for assessing the impact of dyadic memory conformity on memory recognition.

There are four empirical chapters (2-5) in this thesis. Within these four chapters are four separate and related studies, which examine the influence of familiarity, trust, confidence, and memory esteem on memory distortion for ordinary events and for flashbulb memory of the terrorist attacks of September 11th, 2001, along with the use of image recording technology (SenseCam™) as an objective measure of memory distortion between dyadic members. In Chapter 2, it was hypothesised that familiarity and trust would interact with reminiscence type (discussion vs. revision) between dyadic members and would result in an increase in memory conformity (both corrective and distortive) and false memory. The findings were consistent with the hypothesis. Chapter 3 followed on from investigating interpersonal constructs on ordinary events, by using flashbulb memory of 9/11 as the stimulus and focusing on interpersonal familiarity, trust, confidence and memory esteem. It was expected that due to people being protective of their memories for meaningful and emotional flashbulb events, there would be low levels of memory conformity. However, with the social power of discussion, as evident in Chapter 2, people would possibly alter their memories in favour of another person whom they know. We proposed a new concept and termed it memory esteem and predicted that this would negatively relate to memory conformity. The findings were consistent with the expectation. Chapter 4 involved investigating the impact of using visual record keeping for dyadic members undertaking everyday tasks and its subsequent impact on memory distortion. It was found that image diary technology and its interaction with interpersonal trust and memory esteem resulted in lowering memory conformity. Having investigated shared memory and the outcomes for memory conformity and false memory in the previous chapters, in Chapter 5 we examined individual recognition memory and found that memory esteem negatively predicted corrective and distortive memory conformity, leading to positive and negative outcomes for recognition memory.

In sum, the research presented in this thesis suggests that interpersonal relationship factors have important influences on shared memory and subsequent memory distortion. Further, that the visual record keeping could be further used as a tool for investigating normal memory function and possibly for aiding conformity reduction. These findings fill a gap in the shared memory research and the important implications of these findings for everyday life and for the judicial system are discussed.
Declaration

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The ethical standards of the University of Limerick and the American Psychological Association (APA) were followed in the conduct of this PhD research.

This thesis is formatted according to the American Psychology Association (APA) style (6th edition).

I declare that this thesis is my own original work. Any assistance or information I have received in developing the materials herein is duly acknowledged.

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Chapter 1

Introduction
Memory is an important aspect of every person’s life. Imagine one day you are reminiscing with your brother about your beloved dog that had died a few years back. Your brother recounts his memory of how Misty the dog died. “I remember clearly when Misty was knocked down outside our house by a green truck, and died instantly” he said. I look at him in confusion, as I vividly remember Misty being run over by a car outside my house (many streets away), being brought to the vet for surgery and living for many months, until he eventually died from his injuries. I narrate my memory of the same event to my brother and he too has a look of confusion on his face. These were such contrasting memories that I was intrigued and also, felt protective that this memory that I held dear was the accurate one. This is not an uncommon experience for many people sharing their reminiscent memories of past events with another person, often with very different memories to each other. When I enquired how my brother had attained this memory, he then questioned and doubted whether it was how he actually remembered it, or that possibly it may have been altered based on discussions with our mother and father and other individuals whom he knew. It is quite possible that both our versions had been distorted and changed based on social interactions with other people.

You rely on your memories for who you are as a person, where you have been, and what you have experienced in your life to date. But, what if it turned out that these memories that you held closely weren’t your memories at all, or what had occurred was completely different to how you remember it? What if they were someone else’s memories? Without documented written or recorded evidence, how do we ever know whether our memory is ours, or as a result of altering our memory in favour of someone else's memory, possibly someone we know? The current research aims to address these questions.

Memory is fallible, malleable, and vulnerable to alteration. Memory is not comparable to a photograph, unchanged by time (Schacter, 1999). It is constantly reconstructed, distorted,
and contaminated by our interactions with our environment and with others. It is commonly accepted that the social environment and fellow group members influence each other’s memories for events, and this is arguably most evident in the smallest but most common of all groups; the dyad (pair of individuals). We all engage and interact with another person in our daily lives and have interpersonal relationships with individuals such as siblings, romantic partners, friends, parents, work colleagues, teachers etc. So how do these interpersonal relationships with people we know affect our shared memory of past event details?

Shared Memory

Remembering can be an inherently social process, in that we often share our memories in a group context, with people or another person (Barnier & Sutton, 2008). Shared memory, in the current research, is defined as reminiscing on past event details or items (retrieval) via interaction with another individual in a dyad (also known as shared reminiscence). According to Roediger, Bergman, and Meade (2000), “In many circumstances in society remembering is a social event” (p. 129). Most often, we remember events with one other person, which we do in a pair (dyad), such as when siblings discuss the death of a beloved pet, when friends reminisce about a concert they attended, when romantic couples discuss a movie they watched together, or when work colleagues remember the events of an accident that they witnessed. Wegner (1987) determined that individuals in dyads share memory storage, in what he termed transactive memory, and by this suggested that people have their own internal memory storage, but when interacting with others, have access to an external memory. This is the case specifically when dyadic members share a group mind for accessing memory for past events, due to a cognitive interdependence on one another’s memory for an event (Wegner, Giuliano, & Hertel, 1985). According to Wegner, Erber, and Raymond (1991), pairs of romantic partners outperformed unacquainted, impromptu partners
on memory performance tasks, due to a shared storage system, in which each individual can retrieve their memory. Though, the transactive memory theory of dyadic memory may highlight some benefits of shared memory, it is widely accepted that the cognitive and social influences of one person’s memory on another has distortive effects for shared remembering, and these consequences have been recognised to a large extent in eyewitness testimony research (Brainerd, Reyna, & Ceci, 2008; Lane & Zaragoza, 2007; Loftus, 2003; Memon, Zaragoza, Clifford, & Kidd, 2010; Pezdek & Lam, 2007).

**Eyewitness Testimony**

The judicial system, law professionals, and in particular members of a jury, often assume eyewitness accounts from individuals are dependable and reliable, and they are inclined to overestimate the trustworthiness of them (Loftus, 1996). Jurors have a particular tendency to accept that an eyewitness’s memory for an event is accurate if this eyewitness is confident about details of an event, and subsequent identification of a suspect (Cutler, Penrod, & Dexter, 1990). Indeed, the majority of innocent people who were exonerated by DNA evidence in recent years had been initially convicted mainly due to mistaken eyewitness testimony (Wells et al., 1998). Research has revealed that faulty eyewitness evidence is the most common grounds for false convictions (Huff, Rattner, & Sagarin, 1996; Scheck, Neufeld, & Dwyer, 2003). Gross, Jacoby, Matheson, Montgomery, and, Patel (2005) found that eyewitness error was the main mistake in 50 percent of the wrongful homicide convictions and 90 percent of the wrongful rape convictions, which were afterwards vindicated by DNA evidence in the US between the years 1989 and 2003. Bearing in mind how much research has been done on ensuring that the implementation of other types of forensic evidence is accurate, it is paradoxical that the judicial system has not until recently paid attention to research regarding the reliability of eyewitness memory (Wells, Memon, & Penrod, 2006).
Postevent Information

It has been suggested that problems in eyewitness testimony accuracy could be attributed to people encountering information after the event has occurred (postevent information), which has been found to distort a person’s memory for an event, and which is particularly influential, when the postevent information is inaccurate, also known as misinformation (Loftus, 2003; Nourkova, Bernstein, & Loftus, 2004; Semmler, Brewer, & Wells, 2004; Wells & Bradfield, 1998). There are a number of ways in which people can encounter postevent information and specifically, misinformation regarding an event, such as through the media and through the introduction of suggestive or leading information (Gabbert, Memon, & Allan, 2003; Hirst & Echterhoff, 2012). We refer to this as purposeful postevent information in the current research. Possibly, the most influential way to encounter postevent information is via social interaction with another person, through discussion or hearing another person’s memory of an event (Roediger, Meade, & Bergman, 2001; Wells, Memon, & Penrod, 2006; Wright, Self, & Justice, 2000). Wright and Stroud (1998) revealed that one of the most frequent ways that individuals encounter misinformation, which can distort people’s memory for an event, is through media reports. In a study by Loftus (1978), it was demonstrated how misinformation can be adopted by another person, whether accurate or inaccurate, which can then in turn distort a person’s memories for the event. Previous studies have revealed the effects of using postevent narratives for introducing misinformation, and the outcome for memory distortion (Allen & Lindsay, 1998; Belli, Lindsay, Gales & McCarthy, 1994; Searcy, Bartlett, & Memon, 2000; Sporer, Penrod, Read, & Cutler, 1995).

Misleading and suggestive questions or statements are one of the main ways that postevent information is introduced into remembering, and can subsequently result in
distorted memory retrieval of an event (Loftus, Miller, & Burns, 1978; Loftus & Palmer, 1974). Research findings of Higham, Luna, and Bloomfield (2011) showed that providing misleading misinformation about the details of a crime scene resulted in impairment of memory correctness, but additionally, had no effect on metacognitive resolution. In one study which shows the effects of postevent information on reminiscence, participants were shown images of an accident, such as a stop sign at an intersection (Loftus, 1978). Half of the participants were subsequently presented with a leading question which intimated that there was a yield (give way) sign at the scene of an accident, while the other half were not exposed to misleading postevent information. Later during a memory recognition test, the participants who had received the leading false information were more at risk for remembering that the yield sign was part of the original incident, as opposed to those who had not received the suggestive misinformation.

The most common way and arguably the way which has the most powerful effects on shared memory and subsequent memory distortion, is encountering postevent information from another person in a pair (Coman, Manier, & Hirst, 2009; Loftus, 2003; Luus & Wells, 1994; Gabbert et al., 2004; Paterson & Kemp, 2006, Hirst et al., 2009; Skagerberg & Wright, 2008). Research suggests that one of the main consequences of encountering postevent information, and a reason for weaknesses and failings in eyewitness testimony and the outcomes for memory distortion, is memory conformity (Wright, Self, & Justice, 2000), also known as social contagion of memory (Roediger, Meade, & Bergman, 2001). Another outcome of memory distortion is false memory (Loftus & Pickrell, 1995). We will examine the memory conformity literature, then the closely related but conceptually different phenomenon of false memory, and whether the social effects and consequences of memory distortion and illusions can have positive as well as negative outcomes for shared memory, specifically memory conformity and false memory. We will then examine the factors which
contribute to such a phenomenon of contamination. Before we review such literature, we will first provide a rationale for this research being based on recognition memory rather than recall memory.

**Recognition Memory**

In the current research, we decided to focus on recognition memory as opposed to recall memory. The rationale for this was that as the present research is based on remembering in the presence of another person and investigating resulting memory distortion as effects of interpersonal constructs between these individuals, that a recognition based design would give a wider pool of data whilst also being specific to what we wanted to focus on and investigate. Memory recognition tests are used in memory research when you want to minimize the amount of cognitive resources spent by the participants and maximize data in a relatively short period of time during an experimental study (Busey, Tunnicliff, Loftus, & Loftus, 2000; Glucksberg & McCloskey, 1981). Recognition memory is beneficial when you want to acquire a specific insight into participants’ choices than what they usually recall freely from memory (Mecklinger, Brunemann & Kipp, 2011; Nourkova et al., 2004), which was the case in the present studies.

Using recall models can result in greater amounts of items and event details remembered, however, it can subsequently relate to high levels of false hoods and lower accuracy (Kintsch, 1968; Koriat, Goldsmith, & Pansky, 2000). On the other hand, recognition memory provides participants with items to respond to and therefore, reducing the amount remembered but also lowering possible levels of false memory occurrence and often increased accurate remembering (Loftus, 2003). Further rationale for investigating recognition memory is that it has been somewhat preferred specifically in previous experimental designs of memory conformity and false memory studies which relates to the current research (Wright et al., 2000), though cued recall has also been used an experimental
design to elicit memory conformity (Gabbert, Memon, & Allan, 2003). Old/new recognition tests have been more commonly using in conformity experiments and they make scoring and measurement of memory conformity outcomes easier to examine.

There are also models that incorporate both memory recognition and recall (e.g. Wright, Gabbert, Memon, & London, 2008). Wright et al. (2008) carried out two experiments testing memory conformity with one using free recall and one utilising recognition stimulus and found that memory conformity was present in both studies. In a forensic context, it has been found that, specifically in police interrogations, memory conformity occurs for both recognition and free recall, when one person hears the memory of another person, though in varying contexts of remembering (Searcy, Bartlett, & Memon, 2000). Though the cognitive interview has been utilised in interrogational contexts as a tool to increase accurate witness reports and reduce memory falsehoods, by its nature it involves memory recall by encouraging witnesses to report everything witnessed, which can encourage vast details, both accurate and inaccurate, being remembered (Memon, Meissner, & Fraser, 2010). Recognition tasks afford memory cues that enable searching through memory, making it less problematic to recognize elements than recalling them from memory, without such cues (Shiffrin & Steyvers, 1997).

In everyday life there is an emphasis on minimizing the need to freely recall information from memory, for example, auto-complete suggestion forms and visual imagery support to make common decisions easier. As much of our research is interested in designed to reflect interactions between individuals and shared remembering in everyday life and also, publically experienced events, our main reason for using memory recognition was that it give us a clearer picture of what is occurring, specifically relating to memory distortion. However, it must be recognised and noted that a perilous issue of prolonged standing in the study of memory is concerned with the relation between recognition and recall, in that it remains to be
researched to determine what sense are they similar to each other in terms of memory function and outcome, and in what sense do they differ (Tulving & Watkins, 1973). Future research should strive to incorporate a design which is relevant to investigating such shared remembering in interpersonal contexts using both recognition and recall in order for the findings to applicable to the wider memory literature.

**Memory Conformity**

Memory conformity occurs when a person alters their original memory for an event or item, in favour of another person’s memory (Gabbert et al., 2003; Wright et al., 2000). Though it has been extensively found in research that social interactions affect memory conformity, there has been little research which recognises that there are two possible specific outcomes for memory conformity; positive and negative outcomes. In the present research, when one person alters their memorial response in favour of another person, and this memory was originally inaccurate but is subsequently accurate, this is termed corrective memory conformity. Alternatively, when a person changes their memorial response in favour of another person’s response and it is subsequently inaccurate, this is termed distortive memory conformity. Memory conformity (positive and negative) is possibly most prevalent during social exchanges in particular, where one individual’s memory of an event often influences that of another individual in a pair (Gabbert, Memon, Allan, & Wright, 2004; Roediger et al., 2001; Hirst & Echterhoff, 2012; Paterson & Kemp, 2006). In this research, we refer to two types of social reminiscence between individuals in a pair, discussion (verbal exchange of information) and revision (non-verbal exchange of information) and address the varying effects that these types of reminiscence have on memory conformity, both positive and negative. Previously, it has been common to term all changes from an original response as memory conformity, rather than specifically addressing two separate end products as a result of memory distortion. However, the somewhat related research findings on the positive and
negative outcomes for memory conformity as a result of varying reminiscence types (discussion vs. revision) will be reviewed.

**Verbal Discussion and Memory Conformity**

Discussion between individuals, particularly in a dyad is one of the main ways of naturally introducing postevent misinformation, which often results in one person distorting their original memory and adopting the memory of the other person, due to accepting postevent information supplied by that person (Hewitt, Kane, & Garry, 2013). Research by Koppel, Wohl, Meksin, and Hirst (2014) determined that the social relationship between a speaker and a listener in a dyad influences how one person can conform to the memory of another person (social contagion) and the amount of socially shared retrieval induced forgetting (SS-RIF) that can occur has a result of this social bond. It has come to be accepted that discussion between individuals in a pair or co-witnesses can improve and also contaminate memory for items and events (Barber, Rajaram, & Fox, 2012; Allan & Gabbert, 2008; Hirst & Echterhoff, 2008; Paterson & Kemp, 2006; Wright et al., 2000). Jack, Zydervelt, and Zajac (2013) found that misinformation presented by a co-witness in a pair did not decrease accuracy, in contrast to findings of Garry, French, Kinzett, and Mori (2008). Reysen (2007) highlighted the effects of social pressure on memory alteration for shared memory retrieval by demonstrating that that when participants had conformed in their memorial responses to incorrect confederate memories on a group test, they were subsequently more likely to make recognition mistakes when responding on their own in the final recognition test. Other research revealed that group memory does not often measure up to the accuracy of combined individual memory performance scores (Basden, Basden, Bryner, & Thomas, 1997; Lamm & Trommsdorf, 1973; Weldon & Bellinger, 1997.)

Rajaram (2011) claims that collaborating on memory tasks with another person both helps and also impairs memory performance. According to Sarwar, Allwood, and Innes-ker
(2011) verbal conversation between individuals of an experienced event can diminish some aspects of favourable memory and metamemory outcomes caused by simple retelling, but may have no substantial negative influence compared to a control group. Marsh (2007) suggest that people retell events, rather than remembering, and the outcome is dependent on the social context of reminiscence. There is a body of research which demonstrates that the reference to inaccurate details during these discussions can lead to significant memory alteration in memory for an event (Candel, Memon, & Al-Harazi, 2007; Dalton & Daneman, 2006; Gabbert, Memon & Wright, 2007; Garry, French, Kinzett, & Mori, 2008; Hope, Ost, Gabbert, Healey, & Lenton, 2008; Paterson & Kemp, 2006). Using a method called the MORI (manipulation of overlapping rivalrous images) technique, it has been revealed that participants often modify their memory of the occurrence after having conversed about the event details with someone who had seen a different version of the video (Kanematsu, Mori, & Mori, 2003). According to Kanematsu et al. (2003), this was particularly evident if they are asked to come to an agreement about what happened during group discussion. A significant number of studies have attested to the negative effect of suggestive or misleading questioning on eyewitness accuracy (Bekerian & Bowers, 1983; Cole & Loftus, 1979; Loftus, Levidow, & Duensing, 1992; Strange, Hayne & Garry, 2008; Sutherland & Hayne, 2001; Wagenaar & Boer, 1987).

However, the research which suggests that discussing accurate postevent information can lead to improvements in memory, following shared memory retrieval is growing (Basden, Basden, & Henry, 2000; Howe, 2011; Maki, Weigold, & Arrellano, 2008; Marsh, Tversky, & Hutson, 2005; Takahashi, 2007; Wegner et al., 1991). Particularly in interpersonal relationships, memory conformity can result in more accurate memories for an event compared to accuracy rates when a person remaining unchanged from their original memorial response (Wright & Villalba, 2012). Koriat and Goldsmith (1996) claim that due to evidence
that what people remember about an event is inclined to be accurate, it can be reasoned that even if the effect of memory conformity was the same for correct and incorrect information, memory conformity would tend to increase accuracy in most contexts. Roediger et al. (2001) established that memory conformity can result in improved memorial accuracy after discussion between a person with a consistent memory and one with a poor memory. Inaccurate memories have been found to be more susceptible to memory conformity than accurate memories (Wright & Villalba 2012). According to Hollin and Clifford (1983) groups who discuss an event have less accurate memories than people who did not discuss their memories for the event.

Crutchfield (1955) found that using virtual confederates in place of real accomplices, participants often conformed in their responses to both accurate and inaccurate memories on a group test. In a study by Wright and Carlucci (2011) it was determined that memory conformity is not just influenced by verbal discussion between individuals, but rather due to speaking order of those involved in the discussion. Hirst and Echterhoff (2012) attested to the power of conversation between dyadic partners, due to a shared cognitive interdependence and reliance on one another’s memory for an event. Hence, memory conformity is encouraged and promoted by this social power of conversation (Brown, Coman, & Hirst, 2009). It is therefore clear that discussion with another person in a pair is a powerful contaminator of memory, but what about other social interaction which does not involve verbal conversation, but non-verbal exchange of one another’s memories? Now, the outcome for non-verbal revision of one another’s memories in a dyad will be reviewed.

Non-Verbal Revision and Memory Conformity

Recounting a memorial event through non-verbal transfer of information with another person, such as reading a narrative, has also been found to encourage memory conformity between dyadic partners (Tousignant, Hall, & Loftus, 1986). Paterson and Kemp (2006)
referred to similar constructs to the ones we examined (discussion vs. revision) in the current research, when they examined the effects of direct versus indirect transfer of information between dyadic members. Wright and Stroud (1998) illustrated how participants who read a brief summary of a crime provided by another person, which included inaccuracies, then subsequently incorporated incorrect event details into their own remembering of the occurrence. According to Thorley and Rushton-Woods (2013), over one-third of participants who read a written and leading statement afterwards accused the same person as the eyewitness did in their memory report. Witnesses who hear a co-witness choose from a line-up before they pick may be more likely to identify the same suspect from the line-up, as a result of social pressure, even without direct one on one interaction (Levett, 2013; Wright & Schwartz, 2010). Interestingly, Bodner, Musch, and Azad (2009) suggested that the dyad group involved in social interaction was not more likely to report inaccurate and non-witnessed incidences than was a read group who obtained another person’s report of the event by reading a participant’s written report.

Previous co-witness research has demonstrated that using suggestive line-up instructions or a concurrent line-up can decrease an individual’s decision criterion, which in turn fosters more instances of guessing behaviour (Flowe & Ebbesen, 2007; Greathouse & Kovera, 2009; Meissner, Tredoux, Parker, & MacLin, 2005). Goodwin, Kukucha, and Hawks (2013) determined that accomplices who engaged in memory retrieval before participants affected both their private and public memory reports for correct information but only impacted public reports for incorrect information. Recognition memory was affected by memory conformity when people were asked about their memories after being presented with another individual's written report, therefore social effects between dyadic members are evident even when the exchange is non-verbal and non-interactive (Schneider & Watkins, 1996; Skagerberg & Wright, 2008; Wright, Mathews, & Skagerberg, 2005). In a study by
Douglass, Smith, and Fraser-Thill (2005) co-witness information influenced witness identification reports without interaction with a co-witness by via the memory of someone else which was provided through a line-up administrator (Douglass et al., 2005).

In an interesting finding, Merckelbach, Roermund and Candel (2007) showed that a co-witness denying accurate information can have just as powerful of an influence on memory retrieval as a co-witness providing inaccurate reports. Participants who heard a co-witness chose from the line-up were more often also chose a suspect from the line-up than those who heard no co-witness selection or who heard the co-witness reject that the suspect was in the line-up (Carol, Carlucci, Eaton, & Wright, 2013; Levett, 2013). The findings of a study by Schneider and Watkins (1996) showed that what the first person remembered and reported affected what the second person reported, resulting in conformity to the first person’s memory and further, and chance of conformity was reduced when a presented item was rejected by the affiliate. This finding is similar to that of Wright et al. (2005) who determined that the effect of memory conformity is particularly great when one individual in a pair suggests before the other individual, that a non-witnessed item has been seen as opposed to when it is suggested that a witnessed item has not been seen.

Shaw, Garven, and Wood (1997) undertook studies exploring the effect of memory conformity when witnesses are given accurate or inaccurate information about what other witnesses have said, but without the witnesses interacting with each other. The information was provided by the researcher, rather than a co-witness directly and findings showed that many inaccuracies were reported due to conforming to the other person’s memory. That being said, overall, non-verbal interaction has been found to be a less social process than dyadic discussion; hence, such communication results in lower levels of memory conformity than is evident as a result of discussion between individuals in a pair (Gabbert et al., 2003; Paterson & Kemp, 2006). The reason for conversation having a more influential effect on
memory conformity, could possibly be due to a cognitive interdependence on one another in pair (Brown et al., 2009; Hirst & Echterhoff, 2012) though revising ones memory for an event has also been found to have affects, albeit diminished effects for memory change (Coman et al., 2009; Schneider & Watkins, 1996). In the current research we were interested in further pursing the difference between discussion and revision (reminiscence) of one another’ memories as there is a lack of empirical findings relating to comparing these, most research compares discussion between group members versus no discussion and comparing with grouped individual scores. Further, there is limited research which addresses discussion vs. revision in the context of distortive versus corrective memory conformity in shared memory retrieval research.

**False Memory**

A further consequence of shared memory between individuals in a dyad that is often evident is false memory for events and items (Roediger & Gallo, 2004). Through providing suggestive statements and asking leading questions Stark, Okado, and Loftus (2010) showed that individuals, under varying social influences, regularly remember false and non-witnessed details of an event. In fact the powerful nature of leading questions and suggestibility are elements, which frequently enhance memory distortion, particularly when provided as misinformation, during shared retrieval (Gallo, 2013; Higham et al., 2011; Loftus, Miller, & Burns, 1978; Roediger, Bergman, & Meade, 2001). According to research findings of Hyman and Kleinknecht (1999), there are three fundamental conditions that encourage people to retrieve false memories for an event or item. At the outset, an individual has to accept and have no doubt that that the incident occurred, moreover, they will construct a memory of the event and finally, a source monitoring inaccuracy must occur in which a person perceives the false memory as their own original memory (Hyman & Kleinknecht, 1999). Research has established that in the context of memory reconstruction, postevent information and
misleading misinformation in particular can contaminate the memory which a person retrieves, and can in turn have consequences for false reporting of remembered items (Higham et al., 2011; Nourkova et al., 2004; Roediger & Gallo, 2004). Specifically, events which are comparable and have occurred in related contexts can become tangled together and subsequently, the particular event details can be disordered and muddled and include falsehoods, due to misattributing memories to events which have occurred previous to the event of interest (Jack et al., 2013; Loftus, 2003; Stark et al., 2010; Zaragoza, Mitchell, Payment, & Drivdahl, 2011).

Previous research has distinguished between two varying paradigm for false memory construction: The Misinformation paradigm (Loftus 2003) and the Deese-Roediger-McDermott paradigm (DRM) (Roediger & McDermott, 1995), which although, both are related to false memory creation, the former is based on providing people with misinformation, whereas the latter, is focused on providing word lists associated with critical, non-presented words. These paradigms may be similar in theory but they function under varying conditions and contexts (Gallo, 2010). Initially, the Misinformation Paradigm for enhancing false memory will be reviewed, followed by research which has utilised the DRM in the formation of false memories, as a consequence of shared memory. Loftus (2003) established that the misinformation effect is generated most often when individuals are provided with inaccurate, non-witnessed postevent details, which in turn leads to the incursion of false details in people’s memory reports. As a consequence of this misinformation effect, non-presented items and event details have been reported, for instance, wounded animals that weren’t originally there (Nourkova et al., 2004), and broken glass at the scene of an crash, when originally there was no broken glass present (Loftus, 2003). It has been found that due to the fallibility and reconstructive power of human nature, that it is relatively easy to implant entire false events which were not part of the original incident
It has been suggested that recognition memory items are even more susceptible to false remembering than events which are recalled freely (Wright, Loftus, & Hall, 2001). Research findings have suggested that there are two main dominant types of false memory; rich false memories which are consistently and confident held memory accounts and more temporary, doubtful and changeable temporary false memories (Loftus & Bernstein, 2005).

The Deese-Roediger-McDermott (DRM) paradigm is based on false memory creation by encouraging people to report non present critical words, by using associated word lists, which can reflect how postevent information influences everyday social remembering (Cann, Rae, & Katz, 2011; Meade, Watson, Balota, & Roediger, 2007; Sugrue & Hayne, 2006; Watson, McDermott, & Balota, 2004). In the DRM false memory paradigm, false memory is measured by individuals reporting non-studied and non-presented critical words which were not part of an original word list, but which they have later been exposed to as postevent information. An example of such critical word is man, with the associated presented words which may illicit the false reporting of the critical word is: woman, husband, person, male, handsome. These critical words most often sued out of a possible 55 word list are the ones with the highest backward associative strength (BAS) and forward associative strength (FAS), and gist based remembering (Cann et al., 2011; Parker & Dagnall, 2007; Roediger et al., 2001; Roediger & McDermott, 1995; Gallo, 2010). This approach based on BAS and FAS has been found to provide the clearest operational definition of a variable know to influence false memory construction during memory retrieval (Gallo, 2013; Roediger et al., 2001). In his earlier false memory research relating to the DRM, Roediger (1996) coined the term ‘memory illusions’ to attempt to convey the variety and assortment of possible false memories which may occur, proposing that false memories are rarely similar to one another.
on any two separate occasions. Research has found that internal and external postevent encounters in the form of misinformation have been shown to effect memory retrieval correctness by maintaining and fortifying elements of false memory (Bergman & Roediger 1999; Higham et al., 2011; Macrae, Schloerscheidt, Bodenhausen, & Milne, 2002).

Lately, researchers have questioned and argued over the relatedness of both false memory paradigms with the consequences being that both should be measuring the same thing in the form of false memory production, though in reality this may not be the case (Ost et al., 2013; Wade et al., 2007; Zhu et al., 2010). Gallo (2010) advocated that there are often disparate and numerous psychological processes in operation during false memory formation within the two varying false memory paradigms. Zhu et al. (2013) suggested that both paradigms are measuring various outcomes for false memory and advised that there is limited relation between the misinformation and DRM paradigm, and have further questioned the relevance of using the DRM to create false memories for events. False memory formation, in the context of the present research, is based on both the Misinformation Paradigm for inducing false memories through the introduction of postevent information (Chapters 2 and 3) and the DRM paradigm for inducing false memories using associated critical word lists (Chapter 5). I chose to use both paradigms, though under varying memorial contexts, as each paradigm serves a purpose with respect to evoking false memories. The Misinformation Paradigm is more suited to the introduction of postevent information via dyadic interaction with another individual, for the purpose of testing the outcome for shared recognition (Studies 1 & 2). On the other hand, the DRM is more beneficial for examining individual memory recognition, as it uses critical word presentation (Study 4). I would not use both paradigms within the same study as the outcomes for memory recognition using the Misinformation Paradigm would not be entirely comparable with the outcomes for memory recognition using the DRM paradigm, as they operate under varying contexts.
Factors Which Affect Memory Distortion

It is important to consider which factors influence such memory alteration specifically memory conformity and false memory, as a result of shared memory. I will review in detail the factors which the present research is focused on, such as interpersonal familiarity, interpersonal trust, confidence, and memory esteem.

Interpersonal Familiarity

The issue of interpersonal familiarity and its relation to shared memory retrieval and memory distortion has failed to receive the consideration it deserves (but see Hirst & Manier, 2008; Hope et al., 2008; French et al., 2008; Roediger et al., 2001). According to Johansson, Andersson, and Rönnberg (2005), shared collaborative reminiscence between partners in a romantic couple is quite complicated and rates of conformity to another person’s memory appears to be reliant on the division of responsibility and rate of concurrence between the pair. According to Saczynski, Margrett, and Willis (2004) collaborating dyads that were familiar with each other outperformed individuals on all tasks when compared to unacquainted, impromptu dyads. However, research has found that generally, dyads memory performance rarely reaches the high performance scores of collective individual memory task scores (Andersson & Rönnberg, 1996). Johansson, Andersson, and Rönnberg (2000) determined that low rates of agreement between individuals in a couple and high levels of responsibility appear to encourage the lowest rates of negative effects of shared retrieval.

In familiar dyads there has been evidence of increased memory retrieval performance for friend dyads versus non-friend dyads, though dyadic retrieval deteriorated compared to groups of individual collective scores (Andersson & Rönnberg, 1997). The underlying reasoning behind such findings for collaboration is that a friend may provide more directed retrieval cues to other familiar members in a group or dyad than a stranger would group members than an unfamiliar person would (Basden et al., 1997). It has also been suggested
that this could be due to friends sharing a transactive memory system who have access to each other’s memories and are further, familiar with each other's cognitive resources (Wegner et al., 1991). Research has been consistent in determining that friends opposed to non-friends reduced the negative effect of shared retrieval (Andersson & Rönnberg, 1996). Thompson (2008) suggested that the negative effects of shared retrieval such as collaborative inhibition (in which group members remember less when remembering in a group) can possibly be reduced when group members are familiar with each other.

Recently, Takahashi (2007) compared the negative outcomes of collaborative inhibition among familiar friend and nonfriend groups by utilizing the Deese Roediger McDermott (DRM) paradigm for formation of false memory and in contrast to similar research, collaborative inhibition was evident among friends in addition to nonfriends.

Research by Hope et al. (2008) established that familiar friend dyads who were more at risk for reporting inaccurate postevent information acquired from their dyadic partner, which they had not experienced themselves. This results in reduced memory correctness as a result of shared memory retrieval. Andersson (2001) determined that friend group members are argued to cue one another during collaboration in order to support retrieval performance, particularly evident in the performance of friend group members compared to unfamiliar spontaneous group members, for associated word recognition. Research findings have determined that partners in a romantic relationship were more likely to incorporate non-experienced event details in their memory account than dyadic partners who were unfamiliar.

Research supports the idea that familiar shared dyadic retrieval can indeed result in beneficial outcomes for couples, in particular in instances such as humming the tune of a song together (Lewis, 2003). Betz, Skowronski, and Ostrom (1996) found that participants altered their responses in order to fit with the memorial responses that they believed other people who they were familiar with had provided. Jaeger, Selmeczy, O’Connor, Diaz, and
Dobbins (2012) determined that people who viewed memory sources as reliable due to an interpersonal relationship led to improvements in memory performance. Similar to this, it has been revealed that a reason for familiar dyads depending on one each other’s account of an event is probably due to cognitive interdependence and shared cognitive resources (Agnew, Van Lange, Rusbult, & Langston, 1998). However, the majority of the research findings to date are based on an unmeasured familiarity, such as one which automatically exists between friends, family members, romantic partners etc. We argue that this familiarity level differs between dyadic members and between individuals and needs to be measured in order to claim with confidence that the effect is a true one on shared memory and memory distortion. Presently, it remains unknown how interpersonal familiarity influence conformity to another individual’s memory for a specific meaningful and emotional events.

**Interpersonal Trust**

In a dyadic interpersonal relationship, the trustworthiness or untrustworthiness of the source of information can have effects on for shared memory retrieval and the resulting occurrences of memory conformity (Wheeler, Allan, Tsivilis, Martin, & Gabbert, 2013). Findings have signified that a lack of trust can result in fewer instances of one dyadic members conforming to the memory of their dyadic partner (Neuschatz et al., 2007, Semmler, Brewer, & Wells, 2004; Skagerberg & Wright, 2009). In some of the earliest early interpersonal trust research, Giffin (1967) showed that individuals can often rely on another person who they have trust in as a reliable source of information. Research carried out by Lindner, Schain, Kopietz, and Echterhoff (2011) of late demonstrated that increased social influence which originates from in-group members’ memory can result in source confusion when it comes to self versus other in the context of who remembered which event details and who experienced performed specific actions. Such source monitoring problems which stem from source confusion can affect shared memory retrieval and encourage memory distortion.
and are increased when memory encoding is performed in an in-group, which has an implied collective trust, as opposed to in an out-group (Lindner et al., 2011).

According to Frith and Frith (2012) thinking about and comparing another person’s knowledge of events relative to one’s own when in a trusting pair own can affect social learning towards individuals who feel offer an enhanced knowledge, in turn improving the precision of our own interpretation of reality and past events. Findings have highlighted that untrustworthiness and suspicion in particular can lead to eradication of the post identification feedback in memory retrieval (Douglass & Steblay, 2006; Hafstad, Memon, & Logie, 2004; Wells, Olson, & Charman, 2003). When a dyad involves one person being a speaker and one being a listener, viewing a speaker as untrustworthy can lead to lower levels of social contagion compared to when the speaker is viewed as a neutral source (Koppel et al., 2014). Wheeler et al. (2013) determined that trust fosters teamwork, specifically between in-group versus out-group individuals, which encourages memory conformity, albeit an adaptive and beneficial form of memory conformity. Previous research has established that informational influences can encourage memory conformity between dyadic members when individuals are insecure about their own memory correctness and they trust another person more than trust their own remembering of an event (Carlucci et al., 2011; Gabbert, Memon, & Wright, 2007).

Baron, Vendelelo, and Brunsman (1996) utilised two corresponding approaches to examine how conformity varies with the comparative correctness of memory in self versus that of another person whom one knows. These methods either entail manipulating one’s own memory accuracy, or influencing what participants trust about the condition of their partners’ memory and utilising this approach has revealed that instances of memory conformity are amplified when the accuracy of an individual’s own memory is reduced, and vice versa (Baron et al., 1996). The findings of Wheeler et al. (2013) add to the limited studies of such influence of interpersonal relationships, which have found that a close personal relationship
enhances the tendency to conform to the memorial report of another person (Brown et al., 2009; Skagerberg & Wright, 2009; Hope et al., 2008; French et al., 2008). However, similar to familiarity and memory distortion research, this area also remains under researched in the context of specifically measuring interpersonal trust and its subsequent relationship with memory distortion. In the current research, we manipulated trust and also, included self-reported measures of trust to investigate the outcome for shared memory between pairs of individuals. Previous research has focused on an implied built-in trust on the most part, and has not specifically measured this interpersonal construct, which is present to different extents between individuals in a dyad who know each other. Again, similar to interpersonal familiarity research, when studies examined the effects of memory distortion as a result of retrieval between a pair of individuals, they have not focused on measuring the specific levels of interpersonal trust, or manipulating interpersonal trust in the lab.

**Confidence**

Research has revealed that the relationship between confidence and eyewitness accuracy is weak, with many studies demonstrating that confidence in one’s memory does not reliably denote memory accuracy (Leippe, Eisenstadt, Rauch, & Stambush 2006; Lindsay, Read, & Sharma, 1998; Penrod & Cutler, 1995; Read, Lindsay, & Nicholls, 1998; Shaw, McClure, & Dykstra, 2007). Brewer and Day (2005) established that confidence is not a consistent indicator of correct memory details and that this is particularly the case in children’s memory for events. According to Wright and Villalba (2012) memory distortion is reliant on depended on original memory confidence, with indecisive memories being more fallible than confident memories. Research suggests that confidence is, more likely, comparatively unrelated to the accuracy of an individual and that they are at highly susceptible to memory reconstruction (Leippe et al., 2006; Neuschatz et al, 2007). In research carried out by Higham et al. (2011), evidence of accuracy-confidence dissociation was found,
and additionally the influence of the effect of supplying misinformation was predominantly evident with fine-grained memorial responses, intimating that participant’s responses were based on remembered crime scene details.

As described by Leippe et al. (2006), if an individual particularly during shared reminiscence is not very confident in their own account of events, they are more vulnerable to suggestive influences and hence, rely on their dyadic partner or co-witness’s remembering of the details. According to Carlucci et al. (2011) social influences can enhance how often one person conforms to the memory of another person as a result of low confidence levels in their own accuracy levels and therefore, they rely more on the memory of someone they know rather than their own memory. Davis and Loftus (2007) in their research found that verbal feedback from a co-witness can promote memory distortion and influence a person’s confidence and subsequent memorial accuracy in a testimony. Stephenson, Brandstatter, and Wagner (1983) established found that collaborative retrieval increased confidence, wholeness, and memory accuracy and revealed that, “Social recall is an improvement on individual performance” (p. 188). Nevertheless, the researchers stated that while the collaborative group was collectively more confident in their accurate responses than individuals remembering on their own, they were also more confident in their inaccurate memory accounts (Stephenson et al., 1983). It has been determined that when an experimental accomplice reported their confidence in their memory and further, answered before the other individual in a pair, the results indicated that the initial response from the first person subsequently altered the memory of the second person and the higher levels of confidence enhanced incidence of memory conformity (Schneider & Watkins, 1996).

Research by Stephenson, Abrams, Wagner, and Wade (1986) found that people who completed recall tasks on their own, followed by collective group recall had increase
confidence in inaccurate responses that people who undertook the tasks in reverse order, but no significant difference was found in relation to accurate memories for event recall.

An issue relating to confidence, memory distortion, and the use of confederates in experimental memory research is that compared to real co-witnesses or partners, affiliates may have an increased aura of heightened confidence which may encourage a false effect for memory distortion because confederates are rehearsed in the information which they must provide to participants (Paterson & Kemp, 2006). Therefore, such research findings may not be entirely applicable to real life dyadic remembering and the effects of memory confidence of one person on another. In post-identification research, it has been has shown that confidence and assurance in one’s memory accuracy for crime and eyewitness related incidences are increased following approval as opposed to studies on the post-identification feedback effect showing that certainty and confidence in the accuracy of crime-related judgments are higher following confirming as opposed to refuting post-identification feedback from another person, though this effect is dependent on an individual’s original memory confidence (Skagerberg, 2007; Wells & Bradfield, 1998).

Memory Esteem

As we have seen above, there is a substantial body of research which has been dedicated to investigating the role of confidence in shared memory distortion, but what about a construct that is different from confidence, but rather relates to esteem in one’s memory? We propose such a construct which we term Memory Esteem. In the present research, we define memory esteem as that which encompasses one’s worthiness in relation to their ability to remember past occurrences. Though this is a new concept relating to remembering, I will briefly review research which is somewhat similar in concept to memory esteem and what effects that have been found in relation to memory distortion.
Wright, London, & Waechter (2010) investigated memory conformity and found that when in a dyad, the strength of belief in one’s own memory, along with their partner’s memory, and the social dynamics within the relationship affect the level of conformity to one another’s memories. Such conformity was further enhanced by discussion of remembered events. Research has found in the context of source credibility which relates to a belief in the accuracy and strength of a memory source to which a person in a pair they either conform to or not, depending on how credible the person perceives the other to be (Echterhoff, Hirst, & Hussy, 2005; Hirst & Echterhoff, 2012; Skagerberg & Wright, 2009).

French, Garry, and Mori (2011) revealed that participants who had higher memory credibility were much less at risk for incursion of misinformation during verbal interaction, as those with lower credibility. Wright et al. (2010) illustrated the effects of participants’ own, and also the influence of their partner’s memory beliefs, and determined that deciding which memory account is accurate is reliant on both the participants belief in his/her memory and further; the belief in their dyadic partners during shared memory retrieval.

Social and informational influences can encourage memory conformity between individuals when people are hesitant and doubtful about their own memory strength and they depend on another person’s memory which they belief is more reliable their own (Carlucci et al., 2011; Gabbert et al., 2007). It has been suggested based on research findings that conforming to another person’s memory may be a logical, and possibly even an adaptive way for individuals to function within society, in circumstances where we have substantial uncertainty and doubt in our own memory ability (Allan, Palli Midjord, Martin & Gabbert, 2012).

It could be argued that subjective memory belief has somewhat overlapping similarities with memory esteem. Specific research materials in the form of questionnaires have previously been designed to investigate subjective memory beliefs, such as the
Metamemory in Adulthood Questionnaire (MIA; Dixon, Hultsch, & Hertzog, 1987) and Memory Functioning Questionnaire (MFQ; Gilewski, Zelinski, & Schaie, 1990). These questionnaires have primarily been used in clinical settings, with subsequent findings being applicable to clinical populations, and are usually used in conjunction with neurological and cognitive investigative tools (Troyer & Rich, 2002). Another questionnaire which has items which measure something similar to memory esteem is the Memory Self-Efficacy Questionnaire (MSEQ; Berry, West, & Dennehy, 1989). Previous research findings have determined that this questionnaire is a reliable and valid measure of belief in one's own ability to complete tasks and reach goals (Bagwell & West, 2008; Welch & West, 1995). A questionnaire which has an element which measures memory capability is the Multifactorial Memory Questionnaire (MMQ; Troyer & Rich, 2002), which again has overlapping elements with memory esteem, though some vast differences also, in that it measures contentment and strategy also, which we were not interested in. This questionnaire, as with the above questionnaires, is also specific to clinical assessment.

We did not use such questionnaires as a measure of memory esteem as we were not focused on clinical populations, but were interested in everyday dyadic remembering between individuals who have an interpersonal relationship. Further, such questionnaires were not designed with dyadic memory or memory distortion such as memory conformity or false memory in mind. Those research using those questionnaire was also mainly conducted with geriatric participants, in old age research contexts such as hospitals and care home settings and often specific to cognitively impaired individuals (Cook & Marsiske, 2006), which was not our population of the interest in the current research as our research was based on normal functioning adults of all ages.

Further, none of the above discussed questionnaires specifically measured one’s sense of worth in their ability to remember the past, which is what we were interested in doing.
They were not suitable to measure what we termed memory esteem in the current research. Although, widely used and reliability and validity have been determined, the above measures were ultimately different to how we envisioned measuring memory esteem. Their findings were mainly applicable to gerontology and not related to dyads and how dyadic social interaction particularly via conversation, effects memory esteem and subsequent conformity to one another’s memories. There was a need to somewhat bridge a gap in the research between memory belief, confidence, doubt, and uncertainty and its effects on memory distortion. Therefore, we proposed the development of a memory esteem scale to measure one’s own esteem in their memory and constructed our own measure for memory esteem (see. Appendix D, section 5) based on our definition and based on what we wanted to investigate in the context of memory conformity and false memory specifically. We then subsequently investigated the effects that this has on dyadic remembering and also individual remembering.

**Flashbulb Memory, Memory Conformity, and False memory**

In New York, the morning of September 11th, 2001, began the same as any other ordinary day, but then the extraordinary happened. Terrorists belonging to Al Qaeda and under rule of Osama Bin Laden seized control of four passenger aircraft and flew two of the planes into the North and South towers of the World Trade Centre in Manhattan. The third and fourth planes were flown into the pentagon and crashed in Pennsylvania respectively. The number of individuals who lost their lives on that fateful day, which we all watched unfold together, mostly through the media, reached almost 3000, including 363 fire-fighters, and numerous police, ambulance, and service workers. For most people, the events of 9/11 are vivid and clear in their memories and people believe these memories will not be forgotten or altered (Pezdek, 2003; Rimmle, Davachi, & Phelps, 2012). However, is this always the case with flashbulb memories? Are the details of that unimaginable day to remain accurate
and unchanged in people’s memories or is it possible that over time, these memories will be rewritten and remembered differently than how the original sequence of events transpired? What if the vivid picture in your memory is comprised of imagery and words that you shared with friends or others with whom you have interacted with over the years? The term Flashbulb Memory was proposed by Brown and Kulik (1977) to depict vivid memories for emotional and meaningful events, specifically those which occurred in the public domain. This research attempts to address these questions by investigating the effects of flashbulb memory on memory conformity and false memory, specifically as a result of reminiscing on the event with another person whom one knows.

To date, shared memory retrieval research, specifically in memory conformity and false memory, has been dominated by evidence based on ordinary events or events involving eyewitnesses to a crime, but to our knowledge there is no research which has addressed the specific relationship between memory conformity and flashbulb remembering, in what we term Flashbulb Memory Conformity. This refers to the effects of memory distortion and memory conformity for event details regarding meaningful and emotional events, such as the most documented flashbulb memory of the terrorist attacks of September 11th, 2001. We were further interested in the specific effects of interpersonal relationship constructs on false memory occurrence.

Schudson (1995) stated that individuals remember events “collectively, publicly and interactively” (p. 360), in a way that event remembering occurs for a specific audience, based on memory reports from that audience. Such meaningful flashbulb memories are perceived as more resistant to change and alteration over time, than memories for ordinary events (Davidson, Cook, & Glisky, 2006; Rimmele et al., 2012). Pezdek (2003) found that flashbulb memories are defined by the amount of emotional involvement by a person with the target event of interest. Flashbulb memory and the effects which enhance its consistency in
peoples memory has been intermittently researched over the past three decades (Challenger Shuttle disaster by Neisser & Harsch, 1992; deaths of political figures by Christianson, 1989; Curci, Luminet, Finkenauer, & Gisle, 2001; Hornstein, Brown, & Mulligan, 2003; Nachson & Zelig, 2003). These previous research findings have contributed to the understanding that flashbulb memory relates to shocking, unexpected and highly reported public occurrences and is often increased or decreased by a person’s memorial confidence, though this is context dependent (Linton, 1975). The events of 9/11 have been recognised as one of the most public and emotionally shocking events which is relevant to people throughout the world because it unfolded with the world watching and with people sharing their experiences of it as it occurred.

However, no research to date which are aware of has specifically addressed memory distortion for meaningful flashbulb events particularly distortion which is encouraged by dyadic social interaction. Therefore, individuals who have distinct flashbulb memories for public events are said to be able to retrieve these memories or more specifically the feelings and emotions surrounding the event, for years to follow, though this has mainly been the case for autobiographical remembering (Tekcan, Ece, Gulgoz, & Er, 2003; Weaver & Krug, 2004).

Day and Ross (2013) tested a model which comprised of confidence and its effect on flashbulb memories (specifically for Michael Jackson death) and found that over time confidence did not predict memory consistency though it predicted the feeling of a social bond with the public event target. According to Weaver (1993) one specific element that makes flashbulb memories special and unique from everyday memories, is that they are held unchanged in memory, due to high levels of confidence in the flashbulb event memory. McCloskey, Wible, and Cohen (1988) found that confidence in inaccurate remembering of flashbulb events was evident in their research findings and further, distorted and
reconstructed information was retrieved with high memorial confidence each time it was remembered. Talarico and Rubin (2003) determined that confidence is a predictor of flashbulb memory and found that both everyday and also meaningful flashbulb memories are susceptible to reconstruction and decay over time, but also suggested that vividness for flashbulb memory remains steadfast over time.

The introduction of postevent information from another source or through natural incursion via discussion with a person we know, people often adopt the memory of a person they know as their own, through memory conformity (Gabbert et al., 2003). Is it possible that this is also the case for flashbulb memory conformity, specifically for the details of 9/11? Or alternatively does the meaningfulness and emotional aspects of flashbulb memory make people more resistant to alteration and more protective of keeping their memory intact and unchanged? Research has determined that conversing about emotions surrounding flashbulb events results in improved memory for autobiographical memory, though it was also apparent that this led to increased memory distortions and impairments for details of the event, particularly during free recall (Marsh et al., 2005). Marsh et al. (2005) also determined that retelling of flashbulb memory lead to greater memory contamination when participants have to use their own and not their partner’s retrieval cues. It may be the case that memory conformity is often higher for ordinary everyday retrieval as social remembering is not related to the high risks and emotions involved in meaningful events that have affected our lives and those around us. Therefore, it may not be of much consequence if people conform to someone else’s memory for something mundane and unimportant (Brown et al., 2009; Hirst & Echterhoff, 2012). The findings of French et al. (2008) are similar to this as they found high conformity for details of remembering a movie together and this may be due to this every day event not being of vital consequence to the person.
Indeed, it has also been found that due to the power of social influence and particular conversation between individuals, that even flashbulb memories, specifically those of 9/11, which are special to people, can be altered over time (Coman et al., 2009; Hirst et al., 2009). Contrary research findings proposed that flashbulb memories and the autobiographical memories that surround them are intensely detailed and lucid and are impervious to decay (Kvavilashvili, Mirani, Schlagman & Kornbrot, 2003). However, retaining a vivid autobiographical memory does not necessarily mean that people can clearly remember the sequence of event details of meaningful flashbulb events, such as 9/11. Much research to date has not focused on investigating the reported details and accuracy for the original experienced event but rather, for the details about how the person was emotional affected by the event and remember items which were peripheral to the occurrences (Kvavilashvili et al., 2003). In addition, the flashbulb memory research has overlooked the process of when and why individuals do or not conform to each other’s details for meaningful and emotional flashbulb events. I was interested in further investigating if this is indeed the case and in filling the gap in the shared retrieval research, by examining how factors such as interpersonal familiarity, trust, confidence, and memory esteem would impact memory for specific event details of 9/11, particularly the outcome for memory conformity and false memory. In the current research, we examined how these interpersonal factors affect the relationship between flashbulb memory and memory conformity, flashbulb memory and false memory, and memory esteem and flashbulb memory distortion (Chapter 3).

**Image Recording Technology, Memory Conformity, and False Memory**

It is widely accepted that memory distortion occurs and that social interaction influences this under varying conditions and from influential factors. However, there is no measure of the natural interactions between dyad members and how this affects shared memory retrieval. In the current research we proposed using image recording technology
(e.g. SenseCam TM) as an assistive tool in understanding memory distortion, particularly memory conformity and false memory, and to further some explanations into the conditions which encourage it. This was important and due to the amount of research which found the negative outcome for shared memory and has social interaction is a part of everyday life, it is important to work towards finding a way to reduce the negative effects. We expected that by wearing the visual recording device, individuals in dyads would be less likely to conform or alter their memory for the tasks, due to their awareness that their tasks were recorded by still images; therefore there is documented evidence of their memory. Similarly, false memory may be reduced due to people originally taking more care when retrieving their recognition task responses. Members of the judicial system and law professions could be made aware of the possible functions of the image recording device and use it to curb and reduced the negative effects of shared memory retrieval and memory distortion.

Visual record keeping is by means of a small digital camera worn by a user at the front of the body, which contains many electronic sensors which are sensitive to environmental conditions such as light and temperature and continually captures still images (Doherty, Moulin, & Smeaton, 2011). An example of such image diary technology is SenseCam TM which is made by Microsoft's ViconRevue and is different to an ordinary digital camera as it contains a wide-angle fish eye lens that maximizes the field of view of the user wearing the camera (Hodges, Berry, & Wood, 2011). Up until recently, such visual recording devices have mainly been utilised in clinical research settings, specifically in investigating memory impairments in Alzheimer patients and in patients recovering from frontal lobe damage (Sellen, Fogg, Aitken, Hodges, Rother, & Wood, 2007). It has not been extensively tested or used in non-clinical settings or with no patient populations. The earliest SenseCam research used the new technology as a memory support for assisting with memory retrieval for people with weaknesses in memory performance and ability.
One such study was that of Berry et al. (2007) and the use of image diary recording technology with ‘Mrs. B’ who had previously had limbic encephalitis and as a result was left with memory damage and regular occasions of amnesia. In this study the researchers provided Mrs. B with the use of a digital device has a recorded evidence of her everyday and experiences and compared it to a written diary account of everyday interactions. Berry et al. (2007) subsequently found significant benefits of using an image diary over a written diary as it appeared that by viewing the previous saved images in the form of a slide show Mrs. B had the ability to remember 80% of past events along with the added benefit of retrieving autobiographical memory details such as emotions and feelings surrounding the past experience. More recently, researcher and lay people have engaged with visual record keeping as a life logging tool of ordinary everyday events and experiences (Nguyen et al., 2009) and for recording experiences of unhealthy behaviours for the purpose of improving and engaging with healthy life changes (Kerr et al., 2013). In these cases, people make a pictorial image diary of their encounters whilst wearing the recording device and use it as a tool similar to how a video camera would be used, though with the added benefit that the recording device is passive and does not require manual intervention, though a person can intervene and take a normal image if they so wish. We propose that such image recording technology can further be utilised as a tool to make people more aware and cognisant of their memories, in a way that if people are more aware and cognisant of their memories and that they will be retrieving these memories probably in the context of other people, they will be less likely to alter their memory accounts and adopt the memory of others, though it was predicted that interpersonal relationship constructs may interact with the SenseCam and allow low levels of memory distortion. Image recording technology can be used in this way to possibly make lay people aware of the effects of interpersonal relationship and social
reminiscence on shared memory due to the malleability of human nature (Nguyen et al., 2009).

In sum, all the above independent and dependent variables have been reviewed in order to address the main research question in this thesis: What happens when we bring all these interpersonal relationship constructs together, does it increase or decrease memory distortion, in the form of false memory and memory conformity, and further does it promote both or either positive or negative outcomes for shared memory? The present thesis addressed this main question.

**The Present Thesis**

The main objective of this research was to bring together many of these under researched elements of shared memory together in order to investigate their effects for memory distortion, specifically on recognition memory, using a number of related studies. I was particularly interested in the effects of interpersonal relationship constructs on memory conformity (corrective and distortive) and false memory, and in using image recording technology (e.g. SenseCam TM) as a tool to possibly gain more insight as to why these dyadic phenomena occur for everyday and for flashbulb events and possibly as a tool to reduce the negative outcomes of memory conformity (distortive memory conformity). The current thesis contains four empirical chapters, with each chapter being based on a separate study (four studies in total). Three studies pertain to memory distortion as an effect of shared memory (Chapters 2, 3, 4) and one chapter relates to individual recognition in the context of the effects of a new construct which we term memory esteem on memory distortion (Chapter 5).

The structure of the current thesis is a monograph, with different studies in each chapter (references for the empirical chapters at the end of the thesis). The chapters are presented in order of theoretical relevance to the overall aim, objective, and hypotheses of the
research project. Further, the investigations carried out in each study were prompted by previous research findings and by the findings of the preceding studies in the current research project. This thesis consists of six chapters: Chapter 1 (Introduction (with references)), Chapter 2 (Study 1), Chapter 3 (Study 2), Chapter 4 (Study 3), Chapter 5 (Study 4), and Chapter 6 (General Discussion).

Chapter 2: Familiarity, Trust, Memory Conformity, and False Memory

In Chapter 2, the effects of dyadic familiarity and interpersonal trust on shared memory retrieval, specifically memory conformity (corrective and distortive) and false memory, were investigated. An effect moderated by reminiscence type (discussion vs. revision) occurred for both corrective and distortive memory conformity. Therefore, our findings related to previous research which established that improved memorial correctness (corrective memory conformity) is a consequence of shared dyadic memory retrieval (Johansson et al., 2005; Meegan & Berg, 2002; Roediger et al., 2001). Additionally, our findings are related to research which has established that shared collaboration encourages incorrect memory accounts (Echterhoff et al., 2005; Gabbert et al., 2003; Wright et al., 2000). Consistent with expectations, it was further evident that both familiarity and trust positively predicted memory conformity, as a result of verbal exchange of information (discussion) between dyadic members. There was also a significant interaction between reminiscence type, familiarity, and false memory, as it was evident that the highest false memory occurrences were in the familiar, discussion group.

Chapter 3: Interpersonal Relationship Factors, Flashbulb Memory Conformity, and False Memory

The research presented in Chapter 3 followed on from Chapter 2 in that it was found that discussion between dyadic members was much more influenced that non-verbal revision, therefore; we did not feel the need to compare both these social effects in the following
studies. Also, in that Chapter 2 was based on remembering of ordinary mundane details (Machu Picchu video documentary), we were further interested in whether these significant effects would be similar in a meaningful and emotional flashbulb events such as 9/11 in that research suggests that people are more attached to their memories (whether accurate or inaccurate) for emotional events (Rimmele et al., 2012). It was of interest how confidence and familiarity would interact in predicting flashbulb memory conformity. We found that familiarity and trust negatively predicts corrective memory conformity and confidence positively predicts memory accuracy for meaningful and emotional memorial recognition of the events and items related to 9/11. The findings illustrated a significant positive relationship between trust and false memory but not between familiarity and false memory. Until now, there has been no empirical testing to our knowledge of a construct which is related to confidence, and possibly similar to a belief in one’s memory, but that also diverges from both. We aimed to fill this gap in the recognition memory literature. Therefore, in the present research, we put forward a construct which we termed Memory Esteem and defined it as that which encompasses one’s worthiness in relation to their ability to remember past occurrences. Further, we developed and a scale for the purposes of measuring memory esteem, in order to examine its ensuing effects on remembering. Consistent with the hypothesis, we found that memory esteem negatively predicted memory conformity, specifically, corrective memory conformity, but there was no significant relationship with distortive memory conformity. Therefore, this supported evidence for beneficial outcomes of shared memory retrieval for meaningful memory recognition of the flashbulb memories of 9/11.
Chapter 4: Image Recording Technology, Interpersonal Trust, Memory Esteem, and Memory Conformity

Having witnessed the effects on interpersonal relationships on shared memory in Chapters 2 and 3, it was of interest to further examine memory distortion, via an objective measure, specifically as an effect of dyadic trust. The research involved comparing memory retrieval following the wearing of an image recording device (SenseCam TM) to not wearing such a device. Trust was manipulated into high and low trust and it was hypothesised that high trust, along with the social powers of conversation, would increase memory conformity, even in those dyads who wore the image recording device whilst carrying out the memory tasks. It was determined that when people were not wearing an image keeping apparatus, they were more likely to conform to their dyadic partner as there was no recorded evidence of their experience. Until now, there has been no empirical testing to our knowledge of a construct which is related to confidence, and possibly similar to a belief in one’s memory, but that also diverges from both. In Study 2 (Chapter 3) we introduced the concept of memory esteem and found that memory esteem negatively predicted corrective memory conformity. Following on from that, in Study 3 (Chapter 4) we examined the use of visual recording technology and its interaction with memory esteem to examine the of a task reflective of one which could be experienced in everyday life, on consequent outcomes for memory recognition. As expected, it was found that memory esteem negatively predicted corrective memory conformity, and along with wearing an image recording device, it was found that there were resultant lower levels of conformity to another person memory.

Chapter 5: Memory Esteem, False memory, and Memory Conformity in Individual Recognition Memory

We witnessed the relationship of a new concept, which we defined as memory esteem, with dyadic remembering in Chapters 3 and 4, therefore; we were further interested
in investigating this relationship with individual recognition memory in Chapter 5. Also, previous studies (1-3) were all based on shared remembering, hence, this final study (Study 4) was a correlational study examining individual memory recognition, specifically the relationship between memory esteem, memory conformity, and false memory using the Deese-Roediger-McDermott (DRM) paradigm (Deese, 1959; Roediger & McDermott, 1995) for presenting words associated with critical non-studied words. Our aim was to compare these findings of individual memory recognition with the previous shared memory findings. Results indicated that as in Studies 2 and 3, the higher one’s memory esteem, the less they conformed to the memory of another person, in this case the bogus answers of the “majority” which was supplied to participants. There was more evidence of significant relationships in Study 4, than in Studies 2 and 3, with memory esteem negatively predicting each type of memory conformity (general, corrective, and distortive). However, similar to the preceding two studies, there were higher instances of accurate recognition than inaccurate recognition, therefore; supporting the possibility of positive outcomes for conformity to the memory of someone else. Overall, throughout the three studies relating to memory esteem and memory distortion, there was evidence of both positive and negative (corrective and distortive) outcomes for memory conformity, however, overall there were higher instances of corrective memory conformity than distortive, and also relatively low occurrences of false memory. In regards the proposed scale for memory esteem, the research is indeed in the early stages of development, though we found consistent inter-item reliability for the 14 items of the scale throughout all three studies (2-4) which involved memory esteem.
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### Table 1

**Chapters and Their Main Research Hypotheses**

<table>
<thead>
<tr>
<th>Chapter Title</th>
<th>Chapter Number</th>
<th>Main Research Hypotheses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dyadic Reminiscence: Effects of Interpersonal Familiarity And Trust on Memory Conformity and False Memory</strong></td>
<td>2</td>
<td>Familiarity and trust between dyadic members would relate to memory conformity, corrective and distortive, but to varying extents. Reminiscence type (discussion vs. revision) would have varying effects on memory conformity, but discussion between dyadic members would result in more memory conformity than revision. We predicted that both familiarity and trust would separately and positively predict false memory.</td>
</tr>
<tr>
<td><strong>Effects of Interpersonal Relationship Factors on Flashbulb Memory Conformity and False Memory for the events of September 11th, 2001</strong></td>
<td>3</td>
<td>We predicted both positive and negative outcomes for conformity, in the form of corrective and distortive memory conformity for memory of meaningful events of 9/11. It was hypothesised that memory esteem would negatively predict memory conformity for events of 9/11. We expected that familiarity and trust would positively predict false memory for details of 9/11.</td>
</tr>
<tr>
<td><strong>Image Recording Technology and Memory Conformity: Impact of Dyadic Trust and Memory Esteem on Shared Reminiscence</strong></td>
<td>4</td>
<td>It was expected that trust would negatively predict memory conformity. It was hypothesised that trust would interact with wearing a visual recording device and relate to positive outcomes for memory conformity. It was hypothesised that the interaction between memory esteem and wearing a visual recording apparatus would result in a negative prediction of memory conformity.</td>
</tr>
<tr>
<td><strong>Investigating Memory Esteem and its Influence on Individual Recognition Memory</strong></td>
<td>5</td>
<td>We expected that memory esteem would negatively predict memory conformity and false memory for individual recognition. The outcome of whether there would be more evidence of corrective or distortive memory conformity was an open question.</td>
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Chapter 2 (Study 1)

Dyadic Reminiscence: Effects of Interpersonal Familiarity and Trust on Memory

Conformity and False Memory
Abstract

We examined memory conformity among dyads. Specifically, we tested the extent to which interpersonal familiarity and trust among dyads positively predicted their memory conformity to each other, and the extent to which the reminiscence mode (verbal discussion vs. non-verbal revision) moderated these relations. Participants (N = 100) in pairs (dyads = 50) either discussed verbally (Discussion dyads = 25) or exchanged their written details non-verbally (Revision dyads = 25) about a novel, shared experience in the laboratory. Discussing a new, shared event with a partner (vs. comparing each other’s written testimonies) positively predicted corrective memory conformity (personal memory improvement) and distortive memory conformity (personal memory errors). Results suggest that familiarity and trust positively predicted memory conformity, corrective and distortive, only for the discussion group. Familiarity and trust positively related to false memory, but was higher in the discussion group than the revision group. Corrective memory conformity and distortive memory conformity also positively correlated with false memory. We discuss our findings and the implications for familiarity and trust in the context of memory conformity.

Keywords: Memory Conformity, Shared Memory, Dyads, Interpersonal Trust, Familiarity
Dyadic Reminiscence: Effects of Interpersonal Familiarity and Trust on Memory Conformity and False Memory

Imagine that a close relative asks you, “Do you remember your 10th birthday, when your friend closed the front door on your fingers and you went to hospital?” You think, “No, it was my 12th birthday and it was my brother who closed that door on me!” In this situation would you conform to the relative’s account, or, would you believe your own version about what happened? Across time memory for event details fade, are rehearsed and reconstructed in different ways, often times with other individuals interactively. Adopting someone else’s account of the past has implications for what a person believes to be true; this can be advantageous and at times can be potentially perilous. Does how familiar you are with someone or how much you trust someone influence the extent to which you conform to that person’s memory of an event?

Memory has been frequently studied at the level of the individual, however; the reconstructive nature of memorial time travel is an inherently social process. According to Echterhoff, Higgins, and Levine (2009), individuals are motivated to achieve a shared reality through mutual beliefs, which can occur through conversional interactions with another person. Shared reality is theorized as the consequence of generating a commonality between one’s own and another person’s thoughts and memories of an event (Hardin & Higgins, 1996). We propose that interpersonal dependence, in the form of familiarity and trust, can moderate shared memory, specifically memory conformity. Indeed, individuals frequently depend on each other to revisit their memories of the past. Despite the importance of interpersonal relationships in memory recognition, there is limited empirical research which examines dyadic reminiscence, particularly how often two individuals’ familiarity with and
trust in each other influences their conformity to each other’s memory of an event, and the circumstances in which they do so.

The purpose of the present research was to examine the relationship between interpersonal familiarity, trust, and memory conformity in dyads within different memorial contexts. Individuals have crucial needs, such as to share knowledge with each other and to achieve a sense of shared reality. Such sharing often occurs via reminiscing past events (Kopietz, Hellman, Higgins, & Echterhoff, 2010). We propose that interpersonal familiarity and trust are separate constructs, which measure diverse aspects of interpersonal relationships. We examined familiarity and trust in the context of memory conformity, and ensured that our participant-dyads each experienced the same event at the same time. Each person remembered the event on their own, and then remembered it again with their partner. They did this in one of two interactive event reconstruction conditions: verbally versus non-verbally. We attempt to clarify the extent to which pairs of individuals influenced each other’s memory of a shared event, depending on how much they were familiar with and trusted in each other. We altered the interactive reminiscence context, such that the memory conformity due to familiarity/trust would occur more often in one context than in another. While there is no research that directly measures familiarity and trust and its relationship with memory conformity, there are certainly a number of research areas that are related to the topic. Before we address the specific relationship between interpersonal familiarity, trust, and memory conformity, we will briefly review some literature that is relevant to research on shared memory.

**Shared Memory**

Research suggests that individuals in relationships share some of the burden of remembering the past (Wegner, 1987). Shared memory, in the current research, is defined as
reminiscing on past event details or items (retrieval) via interaction with another individual in a dyad (also known as shared reminiscence). Such social interactions can subsequently affect memory recognition. Interactive memory cueing can occur when two or more individuals each search their own memory, one retrieves an event detail, another does the same, and then they exchange the information to form a shared memory (Hollingshead, 1998). Indeed, such cueing is a relatively common means of establishing and maintaining an interpersonal relationship (Wegner, Erber, & Raymond, 1991). In contrast, individuals who consider each other as strangers begin with no shared experiences, no history of interactive cueing or shared memory (Hintz, 1990). However, features of an event can become relevant to two or more strangers if they have opportunities to retrieve details about an event that they each experienced separately but reconstructed jointly later.

The present research attempts to account for the impact of interpersonal familiarity and trust on shared memory phenomena. Hence, we examined the impact of perceived familiarity and trust on memory conformity among dyads who reconstructed a shared event. We next review briefly research on memory conformity and our rationale before describing our study.

**Memory Conformity**

Memory conformity or the social contagion of memory can occur when one person changes their memory for an event by adopting the memory of another individual (Meade & Roediger, 2002; Wright, Self, & Justice, 2000). Previous research has focused on the effects of memory conformity for eyewitness testimony and the judicial system (Gabbert, Memon, & Allan, 2003; Paterson & Kemp, 2006; Skagerberg, 2007). Such a result may exist because of memorial distortions that occur when two or more individuals share details in the reconstruction of an event, such as when postevent information is introduced by another
person (Memon & Wright, 1999; Wright et al., 2000). Memory conformity also impacts everyday remembering between individuals in dyadic relationships, such as remembering the details of daily life (Meegan & Berg, 2002). Discussion between individuals or verbal transfer of information is one of the main influences of memory conformity and determines how much one person adopts the memory of the other person as their own (Skagerberg, 2007, Paterson & Kemp, 2006). Recounting a memorial event through non-verbal transfer of information with another person, such as reading a narrative, has also been found to encourage memory conformity between dyadic partners (Tousignant, Hall, & Loftus, 1986). According to Koppel, Wohl, Meksin, and Hirst (2014) listening to a dyadic partner verbalise their memories can enhance social contagion and socially shared retrieval induced forgetting (SS-RIF), as a result of the power of conversational dialogue between the individuals. Non-verbal interaction has been found to be a less social process than dyadic discussion; hence, such communication results in lower levels of memory conformity than discussion (Gabbert et al., 2003; Paterson & Kemp, 2006).

Research on memory conformity has handled co-witness information in different ways. For instance, one means has incorporated co-witness information into a recall questionnaire, another via an experimenter who informed a participant of responses from fictional witnesses (Hoffman, Granhag, See, & Loftus, 2001). To an extent, such contrived suggestions reflect real life interactions between individuals, such as during conversations, discussion, and other exchanges of information (Gabbert et al., 2003). Sharing imprecise renditions of the past with each other enables the possibility for memory conformity (Assefi & Garry, 2003). Indeed, postevent information often occurs spontaneously when one person engages another in a discussion about the event.
Memory Conformity: Corrective and Distortive

Memory conformity in interpersonal relationships may result in inaccurate memories for an event. This can have negative consequences for the judicial systems and eyewitness testimony in particular. It is not often as important in everyday recall of events, because accuracy is not one of the most important aspects of social remembering (Brown, Coman, & Hirst, 2009). However, memory conformity in interpersonal relationships can also result in accurate memories for an event. For example, Roediger, Meade, and Bergman (2001) found that memory conformity can result in improved accuracy following discussion between an individual with a strong memory and one with a weak memory. In this paper we refer to two types of memory conformity: distortive memory conformity and corrective memory conformity. Corrective memory conformity was measured by how much each participant altered their own response from their original response by adopting the response of their dyadic partner (following discussion/revision with their partner) and this response was then correct. 2) Distortive memory conformity was measured by how much each participant altered their own response from their original response by adopting the response of their partner (following discussion/revision with their partner) and this response was then incorrect. The outcomes for memory conformity as having consequences for both accurate and inaccurate remembering have been found reliable (French, Garry, & Mori, 2008; Hope, Ost, Gabbert, Healey, & Lenton, 2008; Johansson, Andersson, & Rönnberg, 2005; Paterson & Kemp, 2006; Roediger et al., 2001; Wright et al., 2000). As described later, we distinguished between these two forms of memory conformity and examined each as the primary outcomes of our study.

Research has found that memory conformity is influenced by a number of factors, such as confidence ratings (Luus & Wells, 1994; Wright et al., 2000), social dynamics between participants (Wright, London, & Waechter, 2010), power (Cuc, Ozuru, Manier, &
Hirst, 2006) the number of agreeing co-witnesses (Ost, Ghonouie, Cook, & Vrij, 2008), and the relationship between dyadic partners (French et al., 2008; Hope et al., 2008; Johnsson, Andersson, & Rönnberg, 2005; Meegan & Berg, 2002). Previous research has yet to assess the specific relational constructs of interpersonal familiarity and trust between dyadic members on memory conformity under different conditions. Paulos and Goodman (2003) suggested that there are not just people who are familiar, or people who are strangers, but that there are familiar strangers. Such relations suggest a fuzzy boundary between individuals who are familiar with and trust in each other and those who are familiar with but lack trust in each other. Given the ambiguity in prior research about the overlap between familiarity and trust we examined each separately, and assessed the extent to which each related to memory conformity.

**False memory**

Another outcome of dyadic reminiscence, which is often evident in everyday remembering, is the incidence of false memory (Loftus & Pickrell, 1995). Human memory is reconstructive, changeable, and vulnerable to contamination from false memory (Higham & Vokey, 2004; Hirst & Echterhoff, 2008; Loftus, 2003, Roediger, McDermott, Watson, & Gallo, 2001). Envision you have a clear and vivid childhood memory of an event such as being present at your grandfather’s funeral, and remembering many details surrounding that event, such as the people who were present, the weather, feelings you had, and many specific details relating to the day. What if, one day, you found out that you were never present at the funeral that day and that this memory couldn’t possibly be true? It then turned out that this entire memory for the event was not only changed, but completely inaccurate and false, and you find out it is probable that you have this memory as a result of discussing the event with someone you know. It is widely accepted in memory research that such a scenario is not only
possible, but is a regular occurrence due to the fallible nature of human memory, and the false memories that can result from memory distortion (Zhu et al., 2010).

In the current research, we were interested in the specific and separate effects of dyadic familiarity and trust as interpersonal constructs involved in shared reminiscence, and the resultant outcomes for false memory for everyday, mundane event remembering. There are limited empirical findings which specifically address these interpersonal effects on false memory, but indeed we will first review the related false memory research findings and the conditions which effect memory distortion and promote false memory construction.

Previous research on memory contamination and reconstruction has revealed that postevent information can distort what an individual remembers and can subsequently result in false memory for an event (Roediger, McDermott, Pisoni, & Gallo, 2004). Under certain circumstances (e.g., leading questions and suggestive statements) people often report false details of a witnessed event (Stark, Okado, & Loftus, 2010). Hyman and Kleinknecht (1999) suggested that there are three crucial conditions for individuals to retrieve a memory of a false event. Initially, the person must consent and believe that the event happened, furthermore, they will create a memory of the event and lastly, a source monitoring error must occur in which the individual declares the false memory as their own experienced, personal memory. Suggestibility and leading questions are common elements which encourage memory distortion (Loftus, Miller, & Burns, 1978; Gallo, 2013). Events which are similar in nature, can be confused, and the details can be skewed and contain falsehoods due to misattribution and the false remembering of event details from a separate, but related past event (Zaragoza, Mitchell, Payment, & Drivdahl, 2011).

There are two different paradigms for false memory formation: The misinformation paradigm (Loftus 2003) and the Deese-Roediger-McDermott paradigm (DRM) (Roediger &
McDermott, 1995), which have been found to be somewhat related, though also function differently under varying conditions for enhancing false memory. Firstly, we will discuss false memory creation as an outcome of the misinformation paradigm. According to Loftus (2003) false memories, as a result of the misinformation effect, are generated mostly by providing people with postevent information details. As a result of the misinformation effect, fictitious items and events have been remembered, such as broken glass at the scene of an accident, when there was no glass (Loftus, 2003), wounded animals that weren’t present (Nourkova, Bernstein, & Loftus, 2004), and Minnie Mouse instead of Mickey Mouse (Zaragoza, Belli, & Payment, 2007). It is moreover possible to plant false memories for entire events that never occurred (Loftus 2003).

The Deese-Roediger-McDermott (DRM) paradigm has also addressed false memory formation, along with memory decrement, which can occur during leading questions or during exposure to event remembering of another person (Watson, McDermott, & Balota, 2004). In the DRM false memory paradigm, participants are exposed to words, which are related to a non-presented critical word such as sleep: bed, rest, awake, night, bed, tired, dream, wake, snooze, blanket, doze, slumber, snore, pillow, nightmare, nap, yawn, and drowsy (Roediger & McDermott, 1995; Roediger et al., 2001). Roediger (1996) presented the term ‘memory illusions’ to attempt to portray the possible diversity in false memories, with the suggestion that no two false memories are the same. External and Internal postevent encounters can effect retrieval accuracy by preserving and reinforcing elements of false memory (Bergman & Roediger 1999; Higham, Luna, & Bloomfield, 2011).

With two different false memory paradigms which are related to false memory formation, recently researchers have begun to question how related they really are to each other, or whether they are measuring different outcomes (Zhu et al., 2013). Gallo (2010)
suggested that there are multiple and often opposing psychological processes involved in false memory creation in the two different paradigms. Zhu et al. (2013) proposed that there is actually little relation between the DRM paradigm and misinformation paradigm in relation to false memory and have questioned the relevance of the DRM to false memory creation. The current research is based on the misinformation paradigm for inducing false memories through the introduction of postevent information. The rationale for using the Misinformation Paradigm over the Deese-Roediger-McDermott (DRM) paradigm in the current study is because the objective was to investigate memory conformity using stimulus which can best relate to everyday, ordinary event detail remembering (such as documentary with items which would often be encountered, both visual and auditory items) so this paradigm would be more suitable than the word list stimuli used in the DRM.

**Interpersonal Familiarity**

Familiarity between acquainted dyads as opposed to unacquainted dyads has been found to influence collaborative memory by enhancing everyday memory for daily tasks (Johansson et al., 2000). Meegan and Berg (2002) have found that within social interpersonal relationships, collaboration can serve as a compensatory function, particularly in older adults. The perceived familiarity between two individuals is important, because in part, research suggests that the social effects of these elements on memory can shape memory and how individuals share their own account of an event (Hirst & Echterhoff, 2012). It has been argued that familiar dyadic collaboration results in positive outcomes for couples, for example, while humming the tune of a song together (Lewis, 2003). Harris, Barnier, Sutton, and Keil (2014) found that individuals offset their unreliable memory systems by eliciting the assistance offered by a dyadic partner during reminiscence, and results in a beneficial outcome for shared memory.
Research on familiarity suggests that familiar dyads rely on one another’s memory for an event, possibly due to cognitive interdependence (Agnew, Van Lange, Rusbult, & Langston, 1998) and to existing social bonds (Fleming & Darley, 1991). Hope et al. (2008) found that dyads who were friends were more likely to report misinformation obtained from their dyadic partner, which they had not witnessed themselves. This suggests less accuracy as a result of interpersonal collaboration. Autobiographical recall of the details for personal and social events is closely related to the perceived recall ease of such events (Ritchie, Skowronski, Walker, & Wood, 2006). The research of French et al. (2008) similarly supported that finding; they determined that romantic partners were more likely to report non-witnessed events than dyads who were strangers. Similarly, Andersson and Rönberg (1995) argued that collaborative recall suffered from the effects of friendship. However, Saczynski, Margrett, and Willis (2004) ascertained that collaborating married dyads generally outperformed stranger dyads in everyday tasks. However, though familiarity is implied in many studies that look at acquainted versus unacquainted dyads, these did not involve directly measuring familiarity and its relationship with memory conformity and false memory. The present study did.

**Interpersonal Trust**

When an individual feels they can trust a source of information from a competent co-witness, this feeling can enable memory conformity between dyadic partners, and can lead to greater occurrences of the misinformation effect (Brown et al., 2009; Echterhoff, Hirst, & Hussy, 2005). In an interpersonal relationship, the trustworthiness of the source of information can have effects on the resulting levels of memory conformity, such as untrustworthy or suspicious source. The lack of trust can lead to lower levels of memory conformity between dyadic members (Neuschatz et al., 2007; Semmler, Brewer, & Wells,
2004; Skagerberg, 2007). Stinnett and Walters (1977) suggested that trust increases security in a relationship by reducing intrapersonal inhibitions and defensiveness, and thus enables individuals to share their feelings with each other. Larzelere and Huston (1980) suggested that trust is, in part, an attribution of benevolence by one person to another. It has been found that dyadic members who were friends were more likely to trust their dyadic partner, as trust was implied to be key part of friendship. Hence, they were more susceptible to remembering their partner’s memory for a theft as that of their own memory of that event (Hope et al., 2008). Further, interpersonal trust involves an emotional bond between individuals, such as romantic partners. Trust could account for why dyadic partners are sometimes disposed to adopting the memory of a person (French et al., 2008).

While research on interpersonal trust is relatively common among romantic couples (French et al., 2008; Hope et al., 2008; Johansson et al., 2005), comparatively less research has been conducted between family members or work colleagues. Also, research that has examined trust did not involve directly measuring trust and its relationship with memory conformity. We suggest that establishing interpersonal trust in another person is relatively common, even among those who are less bonded emotionally than intimate partners, such as between drivers on the commute to and from work or between an internet store who prompts a buyer for a credit card number.

Indeed, interpersonal trust facilitates the relations between group members because it fosters conditions in which the individuals’ memory is suboptimal (Rau, 2005). From one view, the more people trust each other, the more opportunities each person could perceive to improve their own memory of a shared event. germane to the present research, Johnson-George and Swap (1982) suggested that trust is an efficient indicator of familiarity; however,
one person may know a lot about another person but may not necessarily trust in them. We examined such ideas in the present study.

**Reminiscence: Verbal Discussion versus Non-verbal Revision**

Ordinary interaction between pairs of individuals frequently involves conversations in which past events are referenced, discussed or otherwise rehearsed (Paterson & Kemp, 2006). Individuals also revise their own memories of events privately after learning new information from another person’s account of the same events (Gabbert et al., 2003). For example, during investigation of the Oklahoma bombing (1995) it was found that one witness unintentionally influenced two other witnesses by talking with them about what had occurred (Memon & Wright, 1999). Postevent misinformation was introduced by one person to others who were less certain about what had occurred, resulting in their memory conformity with the person who had shared with them. Introducing information after an event has occurred, particularly when this information is introduced through verbal or non-verbal information exchange from a dyadic partner, can lead to the person adopting this information: the misinformation effect (Echterhoff et al., 2005; Loftus, 1992; Paterson & Kemp, 2006).

Postevent information can be introduced via a discussion between two or more people, such as between a participant and a confederate (Meade & Roediger, 2002) or through discussion between natural dyads, such as friends, co-workers, romantic partners, and even between strangers (Gabbert et al., 2003). Gabbert, Memon, and Wright (2006) highlighted that the characteristics of a discussion between dyadic members are prominent influences of memory conformity. How one person socially influences another person, particularly in a dyad, is a common everyday process (Skagerberg & Wright, 2009).

Discussion between group members, specifically dyadic members, is a natural method for incursion of postevent information (Marsh, Tversky, & Hutson, 2005; Wright, Mathews,
& Skagerberg, 2005). This affects shared reminiscence because when people talk to others, they give their version of events which can contaminate the memory the other person holds for that event (Loftus, 2003; Sarwar, Allwood, & Innes-Ker, 2011). Previous research has highlighted how diverse social and cognitive processes can promote people to report what another person remembers as opposed to what they witnessed themselves (Blank, 2009; Rajaram & Pereira-Pasarin, 2010; Sutton, Harris, Keil, & Barnier, 2010; Wright, Memon, & Skagerberg, 2009). Peer influence is typically established through a co-witness, either another participant or a confederate, who witnesses the same event and engages in the same memory retrieval task as the participant (Skagerberg & Wright, 2008). Paterson and Kemp (2006) found that direct transfer of knowledge between individuals effects reminiscence more than indirect transfer of event information. Similarly, Hirst and Echterhoff (2012) have found that remembering through speaking in a conversation is a powerful way to reshape individuals’ memory for an event, as opposed to remembering without speaking.

Postevent information can also be introduced through revising one’s own event memory after reviewing a partner’s written memory of the event (Gabbert, Memon, Allan, & Wright, 2004). In their research, they examined revision of another person’s responses about a read passage. They reported that the process of discussion resulted in more instances of memory conformity than participants who read each other’s report of their retrieved memories. On the contrary, the findings reported by Bodner, Musch, and Azad (2009) revealed that individuals who discussed an event were not more likely to report non-witnessed details than individuals who had read then revised each other’s narrative. Therefore, the evidence is mixed and in need of further research.

In the present study, we manipulated the event reconstruction context via event discussion (verbal) versus event revision (non-verbal). By discussion, we refer to the verbal
transfer of information between dyadic partners, and by revision, we are referring to the transfer of non-verbal information between dyadic partners (similar to Paterson and Kemp, 2006). Both are social exchanges; however, verbal discussion involves more interaction between individuals than non-verbal information exchange (Garry, French, Kinzett, & Mori, 2008; Hoffman et al., 2001). We hypothesized that this contextual manipulation would moderate the relation between familiarity/trust and memory conformity among dyads who each shared the same experience in a controlled environment.

In sum, in the present research we simulate a realistic social interaction between two individuals who shared a new experience in the laboratory (i.e., watching a clip from an anthropological documentary together). After remembering the details about the video on their own, one group engaged in a discussion about what each person remembered, and then changed their initial details if they wanted to. A second group reviewed each other’s written account of the event (i.e., they exchanged event details non-verbally), and then revised their own accounts if they wanted to. Each reminiscence context was consistent with previous research on memory conformity. The present study builds on prior research by manipulating the reminiscence context, and adds to this research by examining the impact of familiarity and trust on memory conformity and false memory.

The Present Research

We investigated memory conformity in dyads. We were particularly concerned with the relation between interpersonal familiarity and memory conformity, between interpersonal trust and memory conformity, and the extent to which two different interactive reminiscence contexts could moderate these relations. Based on previous related research (French et al. 2008; Hope et al, 2008; Skagerberg & Wright, 2009), we hypothesized that familiarity and trust would correlate positively, and that each would correlate positively with memory
conformity; however, the extent to which familiarity and trust predicted memory conformity, separately and jointly, was an open question. We predicted that familiarity and trust would have different relations with corrective and distortive memory conformity, because although dyads such as friends, family, and romantic dyads may be familiar and trust one another, they would have differing levels of familiarity and trust. For example, individuals in a romantic dyad may have higher levels of trust in each other than a friendship dyad, although they might report similar levels of familiarity. Further, family dyads, such as a pair of siblings, may have high trust but may not rate as high in familiarity. Hence, we tested one model that examined memory conformity as a function of familiarity, while controlling for trust, and we tested another model that examined memory conformity as a function of trust, controlling for familiarity.

Importantly, we manipulated the reminiscence context in two ways, with participants either in the discussion or revision group. For both conditions, memory conformity was measured by how much each person altered their own response (i.e., adopted the response of their dyadic partner). The consequence of adopting the other person’s response resulted in a correct response (i.e., corrective memory conformity) or an incorrect response (i.e., distortive memory conformity). We predicted that the relation between familiarity and trust and memory conformity would be stronger for the discussion group than for the revision group. Social interaction affords individuals the opportunity to clarify exactly what each person knows and doubts about a shared experience and research suggests that dyadic members are more likely to adopt misinformation from a credible source such as a person they are familiar with and trust (Brown et al., 2009; Echterhoff et al., 2005). The non-verbal exchange of information and subsequent memorial revision, however, is more likely to produce hesitation and doubt in another person’s account of the experience (Paterson & Kemp, 2006).
We were further interested specifically in how dyadic familiarity and trust impact false memory occurrence. In this study, we examined the effects of these interpersonal relationship variables on false memory, for recognition of details of a Machu Picchu documentary. We predicted that there would be more false memory as a result of verbal exchange of information (discussion group) compared to non-verbal exchange of information (revision group) following dyadic reminiscence of an ordinary event. We further hypothesised that there would be a positive relationship between familiarity and false memory and trust and false memory, as important elements/as they play important roles in shared memory, even though these constructs involved in knowing someone, have been only investigated in a small number of studies.

Method

Participants

Participants ($N = 100$) included 60 university students and 40 individuals from the general public (70 were women). Their average age was 27.15 years ($SD = 14.40$, $min. = 17$, $max. = 84$). The most common relationship status was single (52), followed by in a relationship (23), married (16), cohabiting (5), widowed (2), divorced (1), and remarried (1).

Procedure

To prevent too many of our participant-dyads from either not knowing or knowing each other upon arrival to the study, we assigned each participant to one of two interactive reminiscence conditions, such that approximately half knew each other ($n = 48$) and about half did not ($n = 52$). Given that, we randomly assigned 50 participants to the Discussion group (25 dyads) and 50 participants to the Revision group (25 dyads). Next, for four minutes and 30 seconds each dyad viewed a video clip of a brief documentary about Machu Picchu$^1$. They watched the clip without taking notes or discussion.
After viewing the video, all participants reported their gender, age, and marital status. In both groups, all participants first completed a private, individual recognition test. This recognition test included a list of 15 questions regarding the details of the video clip (see Appendix). The purpose of the initial recognition task was to serve as a means to measure memory conformity, in that memory conformity was measured by how much the participants changed their responses from section 1 (individual recognition) to section 2 (individual recognition following discussion or revision). The memory task was at all times the same recognition test (sections 1 and 2) and the participants had to choose the answers they believed were correct.

In the discussion group, following the individual recognition task, dyadic members then proceeded to discuss each question, and then individually completed the same recognition task again following discussion (section 2). They were instructed to discuss details that they believed had and had not appeared in the documentary (e.g., saw or heard certain musical instruments, animals, etc.).

In the revision group, following the individual recognition task, each participant reviewed the written answers of their dyadic partner and then proceeded to again recognise individually following revision (section 2). Participants in the Revision group were given a chance to review each other’s responses from section 1, and then each had the chance to change their own responses to their partner’s responses in section 2.

Participants in both groups were instructed not to scribble out their original responses when moving from section 1 to section 2, so that we could code for a response change as either a corrective response or a distortive response. Finally, on their own, each participant completed a brief measure of their familiarity with their partner, followed by a brief measure of how much they trusted their partner. Both measures are described below.
Measures

Memory Conformity was measured in two ways: 1) Corrective memory conformity was measured by how much each participant altered their own response from their original response by adopting the response of their dyadic partner (following discussion/revision with their partner), and the change in response was correct (i.e., a detail that a person did not remember initially was recognized in their partner’s response). 2) Distortive memory conformity was measured by how much each participant altered their own response from their original response by adopting the response of their partner (following discussion/revision with their partner), and this response was then incorrect.

False Memory measurement was based on the misinformation paradigm (Loftus, 2003) and exposing participants to suggestive items (purposeful postevent information). False memory was measured by the false recognition of items that were not present in the video documentary (e.g. donkey) or that they remembered incorrectly (inaccurate recognition) to what had actually been present (e.g. black bag instead of brown bag). False memory was measured in section 2 of the task, (item recognition following discussion or revision with a dyadic partner). “Don’t know” responses were measured as incorrect responses. Through suggesting incorrect and also correct postevent information, participants were exposed to items and elements of the video that were not originally present (see Appendix A for further details on multiple choice options). Such false memory can occur readily in everyday conversation during shared reminiscence of event details; hence, we investigated the difference between exchanging this postevent information verbally versus non-verbally and measured the resultant incidences of false memory.

Interpersonal Familiarity, the first of two predictor variables, included six items that were each rated privately by all participants. An example item included, “How familiar are
you with participant A/B?” (1 = not at all familiar, 2 = somewhat familiar, 3 = familiar, 4 = fairly familiar, 5 = very familiar, 6 = extremely familiar). Each item was set to a unique response scale (some items were yes/no response, some items were Likert response); hence, we standardized responses to all items prior to analysis. Positive values represent above-average familiarity; negative values represent below-average familiarity, and a value at zero reflects average perceived familiarity with one’s partner. In the present sample, the items evinced excellent inter-item reliability (Cronbach’s α = .96; lower = .95, upper = .97). As well as self-reported measures of interpersonal familiarity, we also computed a dichotomous measure of interpersonal trust (0 = low familiarity, 1 = high familiarity), computed by halving the scale variable into lowest score ranging through to midpoint (low trust) and midpoint through to highest score (high trust) (see Appendix B section 3 for familiarity measure).

Interpersonal Trust, the second predictor variable, included 11 items. All participants rated each item privately. An example item is, “If my alarm clock was broken and I asked participant A/B to call me at a certain time, I could count on receiving the call” (1 = strongly disagree, 6 = strongly agree). The items were adapted from the Specific Interpersonal Trust scale (Johnson-George & Swap, 1982), which also contained items that were adapted from the Interpersonal Trust Scale (Rotter, 1967). All items were set to the same response scale, therefore; interpersonal trust responses were not standardized. The higher the scores the more trust a participant felt in one’s dyad partner. In the present sample the items evinced excellent inter-item reliability, Cronbach’s α = .98; lower = .97, upper = .99. As well as self-reported measures of interpersonal trust, we also computed a dichotomous measure of interpersonal trust (0 = low trust, 1 = high trust), computed by halving the scale variable into lowest score ranging through to midpoint (low trust) and midpoint through to highest score (high trust) (see Appendix B section 4 for trust measure).
Finally, each *Event Reminiscence* condition was coded such that Discussion = 1 and Revision = 2. This was the hypothesized moderating variable for the relation between familiarity and memory conformity, and for the relation between trust and memory conformity.

**Analytic Strategy**

Our data were clustered, with two individuals nested within each dyad. Hence, we controlled for variance between dyads by including in each analysis a nominal-level dyad variable (i.e., persons 1 and 2 were dyad 1, persons 3 and 4 were dyad 2, etc.). Additionally, given the positive correlations between a) interpersonal familiarity and interpersonal trust and b) each of the two indicators of memory conformity, we included such variables as covariates into each model. Thus, the results that we report cannot be explained by recourse to either between-dyad effects or to the shared variance between our predictor variables, or the shared variance between our outcome variables.

To test the extent to which interactive reminiscence (Discussion vs. Revision) moderated the relations between familiarity and trust and memory conformity, we used the Process macro for IBM SPSS, (model #1; Hayes, 2013). The Process macro enables syntax commands to examine the conditional effects (i.e., discussion vs. revision) among a basic linear model (i.e., the relation between familiarity/trust and memory conformity). In each model, we included the main effect terms for a) the between-dyad variable, b) the event reminiscence variable, c) each of the familiarity and the trust ratings (as a predictor or a control variable, depending on the model), d), the corrective memory conformity score and the distortive memory conformity score (as the outcome or the covariate, depending on the model), and e) the two-way interaction between event reminiscence and familiarity, and between event reminiscence and trust (depending on the model). Figures 1 and 2 illustrate
models. In the Results, we report the effects of familiarity/trust on memory conformity among each of the event reminiscence conditions.

**Results**

**Means and Correlations**

Table 1 includes means and standard deviations for the study’s variables, Table 2 includes percentage change in recognition memory from section 1 to section 2 of task (memory conformity), and Table 3 includes correlations among the study’s variables. As expected, familiarity and trust correlated positively, and the two sources of memory conformity correlated positively. Further, corrective memory conformity scores correlated positively with familiarity and trust. Neither familiarity nor trust correlated with distortive memory conformity. Familiarity and trust both correlated positively with false memory. False memory correlated positively with both corrective and distortive memory conformity.

**Main Effects**

Table 4 includes main effects for familiarity, trust, corrective and distortive memory conformity and false memory (See Figures 3-8 for significant main effects). There were no significant differences between groups on their familiarity and trust ratings. Reminiscence via discussion with a partner resulted in significantly more memory conformity and false memory, than interactive reminiscence via exchanging answers non-verbally.

**Regression Analyses**

Table 5 includes a significant linear regression model for corrective memory conformity, with familiarity and trust as significant predictors. Table 6 includes significant linear regression for false memory, with familiarity and trust as significant predictors.
Moderation Effects

Importantly, reminiscence type moderated the relation between familiarity and memory conformity, and, reminiscence type moderated the relation between trust and memory conformity (See Figures 1 and 2). Below, we report such results for each of the two sources of memory conformity separately.

Corrective memory conformity. Without controlling for trust ratings, but controlling for distortive memory conformity scores, the relation between familiarity and corrective memory conformity scores was moderated by the type of reminiscence, $B = -2.33$ (S.E. = .26), $t(94) = -8.75$, $p < .0001$, 95% CI = -2.86, -1.80, $\Delta R^2$ due to the interaction term = .09.

For those in the Discussion group, as familiarity increased, their corrective memory conformity scores increased, $B = 2.24$ (S.E. = .20), $t(94) = 11.28$, $p < .0001$, 95% CI = 1.84, 2.63; however, no such effect occurred for those in the Revision group, $B = -0.09$ (S.E. = .17), $t(94) = -0.52$, $p = .63$.

Controlling for trust ratings and for distortive memory conformity scores, the relation between familiarity and corrective memory conformity scores was again moderated by the type of reminiscence, $B = -2.40$ (S.E. = .34), $t(92) = -7.01$, $p < .0001$, 95% CI = -3.07, -1.72, $\Delta R^2$ due to the interaction term = .05. For those in the Discussion group, as familiarity increased, their corrective memory conformity scores increased, $B = 2.33$ (S.E. = .36), $t(93) = 6.43$, $p < .0001$, 95% CI = 1.62, 3.06; however, no such effect occurred for those in the Revision group, $B = -0.06$ (S.E. = .19), $t(93) = -0.31$, $p = .76$.

Without controlling for familiarity ratings, but controlling for distortive memory conformity scores, the relation between trust and corrective memory conformity scores was moderated by the type of reminiscence, $B = -1.18$ (S.E. = .22), $t(94) = -5.30$, $p < .0001$, 95% CI = -1.63, -0.74, $\Delta R^2$ due to the interaction term = .04. For participants in the Discussion group, as trust increased, their corrective memory conformity scores increased, $B = 1.17$ (S.E. = .19), $t(94) = 6.43$, $p < .0001$, 95% CI = 0.83, 1.51; however, no such effect occurred for those in the Revision group, $B = -0.06$ (S.E. = .19), $t(93) = -0.31$, $p = .76$.
=.12), \( t(94) = 9.66, p < .0001, 95\% CI = 0.93, 1.41 \); however, no such effect occurred for those in the Revision group, \( B = -0.01, (S.E. = .19), t(94) = -0.10, p = .92 \).

Next, controlling for familiarity ratings and distortive memory conformity scores, the relation between trust and corrective memory conformity scores was moderated by the type of reminiscence, \( B = -1.18 (S.E. = .22), t(93) = -5.28, p < .0001, 95\% CI = -1.62, -0.74, \Delta R^2 = .03 \). For those in the Discussion group, as trust increased, their corrective memory conformity scores increased, \( B = 1.07 (S.E. = .17), t(93) = 6.56, p < .0001, 95\% CI = 0.75, 1.40 \); however, no such effect occurred for those in the Revision group, \( B = -0.10, (S.E. = .21), t(93) = -0.48, p = .61 \).

Distortive memory conformity. Models identical to the above were examined by replacing the positions of each memory conformity score, from covariate to dependent variable. Below, each model controlled for corrective memory conformity scores, and one model did not include a control predictor (trust or familiarity), and another model included a control predictor.

Without controlling for trust ratings, but controlling for corrective memory conformity scores, the relation between familiarity and distortive memory conformity scores was moderated by the type of reminiscence, \( B = -0.78 (S.E. = .26), t(94) = -3.02, p = .003, 95\% CI = -1.31, -0.27, \Delta R^2 \) due to the interaction term = .04. For those in the Discussion group, as familiarity increased, their distortive memory conformity scores increased, \( B = 0.68 (S.E. = .22), t(94) = 3.05, p = .002, 95\% CI = 0.24, 1.12 \); however, no such effect occurred for those in the Revision group, \( B = -0.11, (S.E. = .13), t(94) = -0.83, p = .43 \).

Controlling for trust ratings and for corrective memory conformity scores, the relation between familiarity and distortive memory conformity scores was again moderated by the type of reminiscence, \( B = -0.78 (SE = .31), t(93) = -2.52, p = .01, 95\% CI = -1.40, -0.17, \Delta R^2 \)
due to the interaction term = .02. For those in the Discussion group, as familiarity increased, their distortive memory conformity scores increased, $B = 0.68$ ($SE = .33$), $t(93) = 2.07$, $p = .04$, 95% CI = 0.03, 1.32; however, no such effect occurred for those in the Revision group, $B = -0.11$, ($SE = .14$), $t(93) = -0.73$, $p = .46$.

Next, without controlling for familiarity ratings, but controlling for corrective memory conformity scores, the relation between trust and distortive memory conformity scores was moderated by the type of reminiscence, $B = -0.53$ ($S.E. = .16$), $t(94) = -3.19$, $p = .002$, 95% CI = -0.86, -0.20, $\Delta R^2$ due to the interaction term = .04. For those in the Discussion group, as trust increased, their distortive memory conformity scores increased, $B = 0.39$ ($S.E. = .11$), $t (94) = 3.49$, $p = .007$, 95% CI = 0.16, 0.61; however, no such effect occurred for those in the Revision group, $B = -0.15$, ($SE = .13$), $t(94) = -1.15$, $p = .26$.

Next, controlling for familiarity ratings and corrective memory conformity scores, the relation between trust and distortive memory conformity scores was moderated by the type of reminiscence, $B = -0.53$ ($S.E. = .16$), $t(93) = -3.17$, $p = .002$, 95% CI = -0.86, -0.19, $\Delta R^2 = .03$. For those in the Discussion group, as trust increased, their distortive memory conformity scores increased, $B = 0.40$ ($S.E. = .13$), $t(93) = 3.08$, $p = .003$, 95% CI = 0.14, 0.66; however, no such effect occurred for those in the Revision group, $B = -0.12$, ($S.E. = .14$), $t(93) = -0.86$, $p = .40$.

In all, the results suggest that both the relation between familiarity and memory conformity and between trust and memory conformity did not depend on the shared variance between familiarity and trust. Indeed, similar results occurred when such control variables were excluded and included in the model. The results also suggest that reminiscence type moderated these relations, such that pairs who discussed their memory of the shared event evinced statistically larger effects than pairs who reviewed each other’s work non-verbally.
Indeed, in no model that we tested did the Revision group evince the relations in question.

Finally, among the Discussion group, both familiarity and trust separately predicted increases in both corrective and distortive memory conformity. We discuss these findings and their implications in detail below.

**Examination of an Alternative Model**

We prompted the familiarity and trust ratings at the end of the experiment, because we did not want to suggest familiarity, trust, unfamiliarity, or distrust, at the study’s outset. Prompting the familiarity and trust ratings prior to the shared memory task could have influenced our reminiscence manipulation (e.g., provoked more or less discussion in that group than if trust/familiarity ratings were taken afterward). In doing so we had introduced the possibility that our conceptual model could be in conflict with the temporal ordering of our study’s procedure tasks. The method involved the familiarity and trust ratings after the memory conformity task; the conceptual model involved the memory conformity task after the familiarity and trust ratings. In the present study, we set out to examine statistical moderation by the non-verbal versus verbal reminiscence of the relation between perceived familiarity and trust (predictors) and memory conformity (outcomes). Independent of our procedure, bidirectional statistical relations are inherently ambiguous. Subsidiary analyses of an alternative model included corrective and distortive memory conformity as predictors of familiarity/trust, controlling for the same variables as the original models.

The results from four analyses did not support the alternative model. No interaction between Reminiscence group and Corrective or Distortive Memory Conformity occurred. The relation between corrective memory conformity and perceived familiarity was not moderated by type of reminiscence, $B = -0.21$ (S.E. = .11), $t(93) = -1.91$, $p = .06$, 95% CI = -0.44, .01 (i.e., the effect passes through zero, within a 95% confidence interval; hence, non-
significant statistically). Next, the relation between distortive memory conformity and perceived familiarity was not moderated by type of reminiscence, $B = 0.00$ ($S.E. = .15$), $t(93) = 0.03$, $p = .97$, $95\% CI = -.29, .30$. The relation between corrective memory conformity and perceived trust was not moderated by type of reminiscence, $B = -0.24$ ($S.E. = .14$), $t(93) = -1.66$, $p = .10$, $95\% CI = -.53, .04$. Next, the relation between distortive memory conformity and perceived trust was not moderated by type of reminiscence, $B = -0.34$ ($S.E. = .18$), $t(93) = -1.84$, $p = .07$, $95\% CI = -.70, .03$. In sum, while it may be tempting to pursue results with near/marginal significance ($ps = .06, .07, .10$), we did not. The subsidiary results did not support this alternative model.

**Discussion**

In the present research, we examined interpersonal familiarity and trust between pairs of individuals, and the extent to which each of these predicted memory conformity about the details of a new shared experience. Consistent with our predictions, familiarity and trust (self-reported) each predicted memory conformity positively; the more familiar and trusting one’s partner was perceived by the other, the more often one or both participants changed their mind about event details, to align with the partner’s memorial account of the event.

Importantly, such relations depended upon the reminiscence context. This supports the findings of Hirst and Echterhoff (2012) who suggested that remembering through speaking in a conversation reshapes individuals’ memory for an event. It is also similar to research that suggest the incorporation of misinformation, resulting in memory conformity, is a result of verbal discussion between individuals (Echterhoff et al., 2005; Gabbert et al., 2003; Hoffman et al., 2001; Paterson & Kemp, 2006). Our findings are similar to those of Skagerberg (2007) who established that co-witnesses are influenced by each other in their memory reports when they have engaged in discussion about an event. Contrary to our
results, Bodner et al. (2009) found that individuals who discussed an event were not more likely to report non-witnessed details than individuals who had read, then revised, each other’s written account of the event.

Specifically, both familiarity and trust positively predicted corrective memory conformity for those who had verbally discussed their event details with each other; however, such effects did not occur for those who exchanged their written information with each other non-verbally. These findings support related research from French et al. (2008) who found that individuals previously acquainted with their dyadic partner (e.g., romantic relationship) were significantly more likely to report information obtained from their dyadic partner (implied familiarity and trust) following discussion of the details of a movie. Hope et al. (2008) similarly determined that individuals in an interpersonal dyad (friendship/romantic relationship) were more likely to report non-witnessed memories of a theft, as a consequence of verbal discussion with their dyadic partner. However, such research did not directly measure self-reported interpersonal familiarity and trust, whereas our study did. Our findings differed in that we directly tested the effects of familiarity and trust on memory conformity.

Interestingly, the moderation effect by reminiscence type occurred for both corrective memory conformity and for distortive memory conformity. Thus, our findings relate to research that advocates that improved memorial accuracy (corrective memory conformity) is the result of collaboration (Johansson et al., 2005; Meegan & Berg, 2002; Roediger et al., 2001) and to research that suggests that collaboration produces inaccuracies (distortive memory conformity) for memory retrieval (Echterhoff et al., 2005; Gabbert et al., 2003; Wright et al., 2000).

Our findings for corrective memory conformity are similar to Gould, Kurzman, and Dixon (1994) who found that couples rely on each other’s memory for an event, following
conversation, which resulted in improved memorial accuracy. Harris, Keil, Sutton, Barnier, & McIlwain (2011) and Howe (2011) suggested that dyadic collaboration could benefit memory maintenance through increased event accuracy, what we term corrective memory conformity. Our findings relate to those of Andersson and Rönnberg (1995) who found that familiar dyads who engaged in verbal dialogue had higher levels memory accuracy, but were also more susceptible to misinformation that they attained from their dyadic partner. This is an example of both corrective and distortive memory conformity.

Our findings for distortive memory conformity relate to the research of French et al. (2008) who revealed that discussion between romantic couples led to susceptibility to misinformation from dyadic partners. A lot of research supports our findings that one person who alters the memory of another person has negative effects, particularly following the discussion of an event (Granhag, Ask, & Rebelius, 2005; Memon & Wright, 1999; Skagerberg, 2007). Our results suggest that perceived familiarity and trust improved the quality of memory, only when they could discuss openly their shared experience. Such results suggest that perceived familiarity and trust also distorted the quality of the memory, only when pairs could discuss their shared experience. Thus, compared to a non-verbal exchange of information, the context that enabled a verbal exchange of information facilitated the relation between familiarity, trust and memory conformity, in general.

It was expected that reminiscence type (discussion vs. revision) would have varying effects for false memory, specifically that there would be higher incidence in the verbal discussion group compared to the non-verbal revision group following shared reminiscence. The results supported this hypothesis. This finding is similar to previous findings who determined that this is due to social influence in that during conversation of everyday events similar to that in the Machu Picchu documentary) one person often influences the memory of
their dyadic partner which (Allan & Gabbert, 2008; Hirst & Echterhoff, 2008; Sarwar et al., 2011; Shaw, Garvan, & Wood., 1997). Such conversation promotes memory reshaping and reconstruction in the form of false memories, which may even be rich confidently held false memories if the person has a strong belief in that memory for the event (Coman, Manier, & Hirst, 2009; Loftus, 2003). That being said, Paterson, Kemp & Forgas (2009) suggest that discussion is only harmful for memory retrieval when participants discuss postevent misinformation to which they are purposefully exposed to.

Additionally, we predicted a positive correlation between self-reported familiarity and false memory and also, separately, self-reported trust and false memory, based on the important roles these constructs play in interpersonal relationships and subsequent shared memory retrieval (Brown et al., 2009). Firstly, for familiarity and false memory, the findings concurred with this prediction in that familiarity between dyadic members positively predicted false memory incidences for reminiscence of an everyday, mundane event. Similarly, interpersonal trust also positively predicted false memory. There was greater incidence of false memory in the high familiarity group compared to the low familiarity and also more false memory in the high trust over the low trust group. There was also a positive relationship between false memory and both corrective and distortive memory conformity, which attests to the negative effects of shared remembering. This was due to participants falsely recognising items from the documentary in section 2 of the task, particularly following discussion (to a greater extent than revision) with a dyadic partner. The difference between distortive memory conformity and false memory is that distortive conformity is evident when there is a change from an accurate recognised item to an inaccurate item (following dyadic discussion or revision), whereas false memory is not necessarily a change from accurate to inaccurate recognition, but is measured by an incorrectly recognised item or
event in section 2 (following discussion or revision). There was, as expected, a significant interaction between reminiscence type, familiarity, and false memory, as it was evident that the highest false memory occasions were in the familiar, discussion group. As has been found in previous studies, there was also (albeit lower) evidence of false memory in the familiar revision group, which supports findings of Paterson et al. (2009) that memory distortion occurs after both direct (verbal) and indirect (non-verbal) transfer of information. This further highlights the importance of the reminiscence context between dyadic members in that the interaction between high familiarity and high interpersonal trust along with the social context between individuals serves to promote memory contamination. These findings are similar to other research which supports that individuals who know each other and discuss post events details for ordinary memories after an event influence how the person remembers an event such as false remembering of items or events (Hirst & Echterhoff, 2012; Hope et al., 2008; French et al., 2008; Meegan & Berg, 2002; Peker & Tekcan, 2009).

There is limited research which has directly investigated measures of familiarity and trust, either separately or together, and their specific relationship with false memory, though it is often implied that these are indeed elements of friendship and other dyadic relationships, such as family, and romantic couples, and the outcome is similar to our findings (Hope et al., 2008; French et al., 2008). Knowing a dyadic partner also often leads to better remembering as a result of collaboration, though usually with also accompanying high levels of reconstruction (Echterhoff et al., 2005). The possible reasons for this reliance has been suggested that dyadic members know each other and share a bond and possibly, a shared their memory stores with each person having access both accurate and accurate information for an ordinary event (Howe, 2011).
Consistent with past findings on interpersonal familiarity and trust, our data suggest that these constructs correlated highly (French et al., 2008). Even though there were no differences between the interactive reminiscence conditions on their familiarity and trust ratings, both positively predicted corrective and distortive memory conformity among the discussion group but did not predict memory conformity among those in the revisionary group. While familiarity and trust each predicted memory conformity among the discussion group, the results were not identical to each other: Familiarity had a stronger relationship with memory conformity than trust. One reason for this could be that compared to non-verbal exchanges that participants made in the revision group, verbal discussion afforded each dyad the opportunity to increase familiarity with each other during the study (Skowronska, Gibbons, Vogl, & Walker, 2004). While the pattern was similar for trust, the effect was considerably smaller than that of familiarity, perhaps because trusting a person requires more than a discussion about a relatively impersonal topic in a single setting.

**Implications, Limitations, and Future Direction**

There are implications for these memory conformity and false memory findings for dyads engaged in shared reminiscence, particularly when social interaction via conversation is involved, as it has powerful effects on memory distortion. There is a need for the judicial system, police interrogators, and eyewitness investigators to be aware of the interaction and the subsequent effects of dyadic familiarity and trust on remembering false or reconstructed events and items.

No study is without limitations. Indeed, the present findings need to be replicated, with a few important adjustments. For instance, to prevent our participants from thinking about familiarity and trust at the outset of the study, we assessed each person’s familiarity and trust in each other at the end of the study. It was entirely possible that the discussion (or
revision) manipulation could have boosted their familiarity and trust ratings, simply because interacting with someone else about a shared experience could facilitate such social phenomena (Skowronski et al., 2004). However, our data evinced no statistical differences on familiarity or trust, as a consequence of discussion vs. revision. Further, examination of an alternative model with memory conformity as predictors of variance perceived familiarity and trust evidence no support in our sample. Nonetheless, a replication of our findings might assess familiarity and trust on an entirely separate occasion, removed from the lab tasks. This would help rule-out the potentially confounding relation between our predictor variables, the interactive reminiscence manipulation, and memory conformity.

It must be noted that there could be the possibility that the findings relate to response conformity to another person’s responses rather than a true memory change, which has been researched and found to be a possible social occurrence between interacting individuals (Schneider & Watkins, 1996; Wright & Carlucci, 2011). However, based on the experimenter’s notes on the conversational interactions between the dyadic members in the discussion group, it appeared that how they remembered the details truly changed following discussion with one another and subsequently, one person conforming to the memory of the other individual. Also, to the best of our ability and based on previous types of memory conformity experimentation, the materials and stimuli in the current research were designed to test for a memory change via conformity to another individual, and to avoid testing for response conformity. In future research, further efforts should be made to ensure this is the case, such as including confidence, belief, and esteem measures for memory with each item in the materials. Also, it should be documented that the findings of the current study are based on recognition memory, so would not generalise to recall memory findings. Therefore, future research could incorporate both recognition and recall memory in the research.
materials in order to statistically compare the conformity and false memory outcomes between both.

Warning people of the potential contamination during memory retrieval can diminish the effects of postevent information and diminish false memory formation (Assefi & Garry, 2003). Indeed, people can often resist false memory, often though their strong faith, belief, and confidence in their memory, or due to an attachment with a memory (Pezdek, Finger, & Hodge, 1997). In future research it may be useful to include such warnings to test for a reduction in the negative distortive effects of shared dyadic memory. However, unlike in the laboratory when participants can be debriefed after researchers have encouraged them to produce distortive effects and false memories via the Misinformation Paradigm, debriefing does not occur, therefore the deleterious effects on shared memory is a real life concern.

Next, our experimental manipulation, interaction type (verbal discussion versus non-verbal revision), may have been confounded with other meaningful variables. For instance, verbal discussion could lead to enhanced conformity, because of more information transmitted from one to the other partner, more repetitions of items and memories, greater justification of the accuracy of one’s memory, deeper elaboration, greater conversational force, greater interpersonal immediacy (Mehrabian, 1968) than a non-verbal exchange. It could also that some of our procedure inadvertently imposed social demands, such that some participants may have thought that the postevent information being presented to them was accurate, and therefore they adopted it as their own, even though they have no recollection of it (Zaragoza & Lane, 1994). There was also a possibility that verbal dyadic discussion affords greater readiness for spontaneous social tuning, which may lead to such witnessed memorial outcomes (Ledgerwood & Trope, 2011).
Next, in our sample the correlation between familiarity and interpersonal trust was large \((r = .75)\); leaving about 44% of their variance unshared. To examine this further, the pattern matrix from an Exploratory Factor Analysis with Principle Axis Factor extraction and Oblimin rotation revealed that each item loaded strongly onto their respective factors, with no cross-loading items or additional factors. The trust factor explained about 75.6% of the variance; familiarity explained about 9.5% of the variance. Although such findings strongly suggest that they are separate constructs, future research is needed to elucidate the distinguishing qualities of interpersonal trust and familiarity, especially as each relates to reminiscence, memory conformity and other memorial phenomena.

Additionally, although sometimes useful, self-report ratings are limited. Experimental manipulations of familiarity and trust would add causal support to our correlational findings about memory conformity. Such manipulations could help explain why perceptions and feelings of social closeness can sometimes lead to memory conformity that both clarifies and muddles each person’s memory of an event’s details. Indeed, such research looms on the horizon in our laboratory.

Finally, we operationalized and assessed two kinds of memory conformity: one kind corrected a person’s memory of event details, another kind distorted it. We found that familiarity and trust both predicted positively the correction and distortion of a person’s memory for an event, but only when such information was discussed verbally. This raises questions for us such as: Is corrective memory conformity, as a function of familiarity or trust, or in general, always advantageous? Is distortive memory conformity, always disadvantageous? We hope that the present study provokes further thought and future research that will address such questions.
Conclusions

Memory conformity among dyads is crucial for individuals’ memories of events and for social life in general. Our study suggests that within a social context of sharing memories verbally (discussion) versus a less pronounced social context of non-verbal information exchange (revision) both corrective conformity and distortive conformity and false memory occurred. Importantly, fundamental social variables –familiarity and trust– each helped to explain how the social context can act as a resource for memory conformity. Familiarity and trust each positively predicted both corrective memory conformity among dyads who shared a recent event, but only when such partners engaged in verbal discussion of information for an event. Familiarity and trust also positively predicted false memory. We regard these findings as an important step towards understanding memory conformity in dyads and the different types of errors that can emerge in ordinary social exchanges. In sum, just because two individuals are familiar with or trust each other does not mean they will necessarily conform to each other’s memory of event details; the social context in which they interact reminiscently matters.
Appendix

Table 1

*Means and Standard Deviations for Independent and Dependent Variables*

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Familiarity (standardized)</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Trust</td>
<td>3.71</td>
<td>1.36</td>
</tr>
<tr>
<td>Corrective Conformity</td>
<td>3.78</td>
<td>3.48</td>
</tr>
<tr>
<td>Distortive Conformity</td>
<td>1.94</td>
<td>4.48</td>
</tr>
<tr>
<td>False Memory</td>
<td>2.88</td>
<td>1.33</td>
</tr>
</tbody>
</table>

*Note:* Variables had 100% response rate with no missing data.

Table 2

*Percentage change in memory recognition from section 1 to section 2 (memory conformity)*

<table>
<thead>
<tr>
<th>change in recognition memory from section 1 to section 2 of task</th>
<th>% change from inaccurate to accurate recognition (CC)</th>
<th>% no change from inaccurate recognition (CC)</th>
<th>% change from accurate to inaccurate recognition (DC)</th>
<th>% no change from accurate recognition (DC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>82</td>
<td>18</td>
<td>78</td>
<td>22</td>
</tr>
</tbody>
</table>

*Note:* CC = Corrective Conformity, DC = Distortive Conformity
Table 3

Pearson’s r correlations for each study variable

<table>
<thead>
<tr>
<th>Variable</th>
<th>Familiarity</th>
<th>Trust</th>
<th>C-C</th>
<th>D-C</th>
<th>F-M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Familiarity</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trust</td>
<td>.75***</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrective Conformity</td>
<td>.24*</td>
<td>.26*</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distortive Conformity</td>
<td>.08</td>
<td>.11</td>
<td>.48***</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>False Memory</td>
<td>.48***</td>
<td>.49***</td>
<td>.31*</td>
<td>.41*</td>
<td>--</td>
</tr>
</tbody>
</table>

*Note: ***p < .0005, **p < .005, *p < .05, C-C = Corrective Conformity, D-C = Distortive Conformity, F-M = False Memory*
### Table 4

**Main differences of reminiscence type (discussion vs. revision) for each study variable**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Condition</th>
<th>M</th>
<th>SE</th>
<th>F</th>
<th>df</th>
<th>η²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Familiarity</td>
<td>Discussion</td>
<td>0.11</td>
<td>0.13</td>
<td>0.33</td>
<td>(1,98)</td>
<td>0.003</td>
</tr>
<tr>
<td></td>
<td>Revision</td>
<td>0.00</td>
<td>0.13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trust</td>
<td>Discussion</td>
<td>3.75</td>
<td>0.19</td>
<td>0.12</td>
<td>(1,98)</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>Revision</td>
<td>3.66</td>
<td>0.19</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrective Conformity</td>
<td>Discussion</td>
<td>6.30</td>
<td>0.38</td>
<td>62.62***</td>
<td>(1,97)</td>
<td>0.70</td>
</tr>
<tr>
<td></td>
<td>Revision</td>
<td>1.26</td>
<td>0.38</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High Trust</td>
<td>4.23</td>
<td>0.46</td>
<td>2.17</td>
<td>(1,98)</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td>Low Trust</td>
<td>3.21</td>
<td>0.52</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High Familiarity</td>
<td>4.75</td>
<td>0.49</td>
<td>7.66**</td>
<td>(1,98)</td>
<td>0.07</td>
</tr>
<tr>
<td></td>
<td>Low Familiarity</td>
<td>2.89</td>
<td>0.47</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distortive Conformity</td>
<td>Discussion</td>
<td>2.92</td>
<td>0.19</td>
<td>36.02***</td>
<td>(1,98)</td>
<td>0.60</td>
</tr>
<tr>
<td></td>
<td>Revision</td>
<td>0.96</td>
<td>0.19</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High Trust</td>
<td>1.98</td>
<td>0.20</td>
<td>0.10</td>
<td>(1,98)</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>Low Trust</td>
<td>1.89</td>
<td>0.23</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High Familiarity</td>
<td>2.21</td>
<td>0.21</td>
<td>3.09</td>
<td>(1,98)</td>
<td>0.03</td>
</tr>
<tr>
<td></td>
<td>Low Familiarity</td>
<td>1.69</td>
<td>0.20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>False Memory</td>
<td>Discussion</td>
<td>3.48</td>
<td>0.19</td>
<td>9.50**</td>
<td>(1,98)</td>
<td>0.08</td>
</tr>
<tr>
<td></td>
<td>Revision</td>
<td>2.64</td>
<td>0.19</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High Trust</td>
<td>3.30</td>
<td>0.19</td>
<td>3.86*</td>
<td>(1,98)</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>Low Trust</td>
<td>2.76</td>
<td>0.21</td>
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<td></td>
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</tr>
<tr>
<td></td>
<td>High Familiarity</td>
<td>3.48</td>
<td>0.20</td>
<td>8.67**</td>
<td>(1,98)</td>
<td>0.08</td>
</tr>
<tr>
<td></td>
<td>Low Familiarity</td>
<td>2.67</td>
<td>0.19</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note:* There was no difference in significance between results between controlling and not controlling for each variable, therefore; the controlled for results are reported in the table.

***p < .0005. **p < .005. *p < .05.*
Table 5

Linear regression table (enter method) for predictor variables of corrective memory conformity

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>t</th>
<th>df</th>
<th>CI</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Familiarity</td>
<td>2.63</td>
<td>1.09</td>
<td>0.24</td>
<td>2.41*</td>
<td>99</td>
<td>.47-.8</td>
<td>0.06</td>
</tr>
<tr>
<td>Trust</td>
<td>0.19</td>
<td>0.07</td>
<td>0.27</td>
<td>2.78*</td>
<td>99</td>
<td>.05-.32</td>
<td>0.07</td>
</tr>
</tbody>
</table>

*Note:* ***p < .0005. **p < .005. *p < .05

Table 6

Linear regression table (enter method) for predictor variables of false memory

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>t</th>
<th>df</th>
<th>CI</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Familiarity</td>
<td>0.68</td>
<td>0.12</td>
<td>0.48</td>
<td>5.47***</td>
<td>99</td>
<td>.43-.92</td>
<td>0.23</td>
</tr>
<tr>
<td>Trust</td>
<td>0.04</td>
<td>0.01</td>
<td>0.49</td>
<td>5.51***</td>
<td>99</td>
<td>.03-.06</td>
<td>0.24</td>
</tr>
</tbody>
</table>

*Note:* ***p < .0005. **p < .005. *p < .05
Figure 1. Reminiscence type (discussion vs. revision) moderated the relation between familiarity and corrective memory conformity (top panel), and the relation between trust and corrective memory conformity (lower panel), controlling for covariates in each model.
Figure 2. Reminiscence type (discussion vs. revision) moderated the relation between familiarity and distortive memory conformity (top panel), and the relation between trust and distortive memory conformity (lower panel), controlling for covariates in each model (dotted)
Figure 3. Main effect of reminiscence type (discussion vs. revision) on corrective memory conformity.
Figure 4. Main effect of familiarity (high vs. low) on corrective memory conformity.
Figure 5. Main effect of reminiscence type (discussion vs. revision) on distortive memory conformity.
Figure 6. Main effect of reminiscence type (discussion vs. revision) on false memory
Figure 7. Main effect of familiarity (high vs. low) on false memory
Figure 8. Main effect of trust (high vs. low) on false memory.

Footnotes

1 “Machu Picchu: Lost City of the Inca: Part 1” is available in Windows Media Audio/Video (.wmv) format upon request.
Chapter 3 (Study 2)

Effects of Interpersonal Relationship Factors on Flashbulb Memory Conformity and False Memory for the events of September 11th, 2001
Abstract

Shared reminiscence between dyadic partners who know each other often results in one person conforming to the memory of the other person: memory conformity. We examined interpersonal relationship factors such as familiarity, trust, confidence, and memory esteem and its relationship with flashbulb memory conformity and false memory for the terrorist attacks of September 11th, 2001 (9/11). As predicted, familiarity and trust distorted memory conformity and memory confidence corrected memory conformity. We found that memory esteem negatively predicted corrective memory conformity for events of 9/11, however; this relationship was not significant for distortive memory conformity. There was also evidence of false memory (using the Misinformation Paradigm) for details of 9/11, with trust being a significant predictor of false memory. Familiarity, confidence, and memory esteem were not significant predictors of false memory. There are possible social explanations for these effects for everyday and meaningful events, including the power of verbal conversation and the reliance on trusting a credible source of information. The implications and applications of these findings are discussed with respect to eyewitness testimony, the judicial system, and everyday relationship interactions.

Keywords: Flashbulb Memory, Dyads, Interpersonal Familiarity, Interpersonal Trust, Memory Esteem, Confidence, Memory Conformity, 9/11
Effects of Interpersonal Relationship Factors on Flashbulb Memory Conformity and False Memory for the events of September 11th, 2001

Over a decade later, you review the terrorist attacks upon the USA on September 11, 2001 (9/11), and you think to yourself: “I remember this vividly. It’s like a photograph in my mind. I remember very well what I thought and felt in the moment.” Many individuals attest to the vividness of such a memory; indeed, it is a flashbulb memory (Brown & Kulik, 1977), if not a series of such memories for that era. However, what if your memory for this emotionally potent and personally meaningful event is not entirely your own personal memory? What if the vivid picture is comprised of imagery and words that you shared with friends or acquaintances with whom you have interacted over the years? How much of your own account of 9/11 was imparted to you via the television, radio, and other media? In the present study, we examined distortion in the context of this flashbulb memory, and how much one’s confidence in the own memory and familiarity with another memorial source mattered to memory conformity and false memory.

Memory conformity

In everyday life, adopting someone else’s memory, especially someone one knows, and reporting it as one’s own original memory occurs more often than most individuals realize (see Chapter 2; French, Garry, & Mori, 2008; Gabbert, Memon, & Allan, 2003; Hope, Ost, Gabbert, Healey, & Lenton, 2008). The process of altering one’s memory to incorporate the memory of another person is known as memory conformity (Wright, Self, & Justice, 2000) or the social contagion of memory (Roediger, Meade, & Bergman, 2001). This may occur because, in part, the consequences of adopting another person’s memory of an everyday event may be not be meaningful or important, such as remembering the details of a movie together (French et al., 2008). Social and cognitive processes can each influence a person to report what another person remembers, essentially ignoring one’s own testimony.
and memory (Blank, 2009; Rajaram & Pereira-Pasarin, 2010; Sutton, Harris, Keil, & Barnier, 2010; Wright, Memon, Skagerberg, & Gabbert, 2009). For instance, discussion of event details between individuals occurs frequently in daily life. It is due to ordinary conversation that memory conformity occurs by allowing post-event information to affect a person’s original memory for an event, and altering it to fit with someone else’s memory (e.g., Gabbert et al., 2003; Paterson, Kemp, & Forgas, 2009; Wright, Gabbert, Memon, & London, 2008). Indeed, oftentimes the stakes are relatively low for misremembering or failing to retrieve the details of a movie or other mundane events. We ask, however, whether memory conformity also occurs for flashbulb events, such as 9/11?

**Memory Conformity and Flashbulb Memory**

To date, much research has investigated the distortive effects of flashbulb memory; however, relatively little empirical research has examined flashbulb events in the context of memory conformity among dyads. While recalling a flashbulb memory, many people can remember exactly where they were, what they were doing, and how they felt when they heard shocking and emotional news, such as the assassination of J.F.K., the Space Shuttle Challenger disaster, the death of Princess Diana, and the attacks in the U.S.A on September 11th, 2001. The ability to retrieve autobiographical details following such events was termed flashbulb memory by Brown and Kulik (1977). According to Pezdek (2003), flashbulb memories are determined by the amount of emotional involvement by an individual. Research suggests that flashbulb memories can be as intensely lucid and detailed autobiographical memories that are impervious to decay (e.g., Kvavilashvili, Mirani, Schlagman & Kornbrot, 2003). However, this does not necessarily mean that people can clearly remember the factual details of such intensely emotional events. Further, such research typically does not describe, or attempt to explain, the process by which individuals conform to each other’s details about such events. In the present research, we examined how
details for meaningful and intensely emotional events (flashbulb memories) were impacted upon by post-event information and by the discussion of such information among dyads who know each other.

Talarico and Rubin (2003) suggested that memory decay of flashbulb event details follows similar progression as memory for everyday events; however, the belief in memory accuracy remains high for flashbulb events. Conversely, Davidson, Cook, and Glisky (2006) found that flashbulb memories hold a special source in memory and remain relatively steadfast. They contend that such events were not subjected to decay a year after the event, possibly due to their social, personal, and emotional importance for individuals.

An event detail that people report about 9/11 is that they saw the first airplane fly into the building, yet there was no video footage at the time of the first plane hitting the tower (Greenberg, 2004). People claimed that they knew for certain that they saw this occur, excluding those in the neighborhood who actually did. A likely reason for this memorial error is that post-event information became incorporated with their event reconstruction, such as via discussion with others and the consumption of media reports. Post-event information contributes to memorial revision, for better or for worse, which supports the claim that flashbulb memories are not impervious to change, but are fallible just like non-flashbulb memories.

To date, not much research has examined the how individuals adopt (or refuse to adopt) each other’s accounts of a publically shared and often emotional past event, such as testimonies and information about the details of 9/11. It is also unclear how attached individuals remain to such meaningful and emotional memories, and the extent to which they are willing to revise their own account by adopting the memory of someone else’s memory, who may or may not be known to them (Brown, Coman, & Hirst, 2009). Importantly, some research suggests that memory conformity can occur after sharing memories of a flashbulb
event, just as it occurs when two or more individuals share details for everyday events (Carlucci, Kieckhaefer, Schwartz, Villalba, & Wright, 2011; Skagerberg & Wright, 2008).

Our approach builds on this research by examining important boundary conditions. We attempt to examine the effects of interpersonal relationship factors on flashbulb memory distortion, as a social cognitive phenomenon via discussion of events of 9/11 with a dyadic partner. We were further interested in comparing memory conformity and false memory for everyday, mundane details (such as the remembering documentary details in Study 1) with meaningful flashbulb memory recognition of 9/11 event details in the current study (Study 2). Before I proceed to review the interpersonal factors of interest in this study, I briefly review the relevant literature related to flashbulb memory and false memory.

Flashbulb Memory and False Memory

Indeed, false memory research generalises to real world events as it has been found that it is common to falsely remember public events, particularly traumatic events such as flashbulb memories which evoke lasting memories, whether accurate or inaccurate (Nourkova, Bernstein, & Loftus, 2004). According to literature, the strongest flashbulb memory to date is the terrorist attacks of 9/11. Much of the flashbulb memory research focuses on autobiographical details and the feelings associated with the memory of the event, but not necessarily or specifically the sequence of incidences which occurred on the day.

Research suggests that flashbulb memories can be defined as intensely lucid and detailed autobiographical memories that are impervious to the processes of forgetting (Kvavilashvili et al., 2003). However, this does not necessarily mean that people accurately remember the details of such meaningful and emotional events, with the rate of forgetting and chances of falsely remembering increasing as time goes on (Hirst et al., 2009). When individuals claim that they saw footage of the plane fly into the building on minutes after it occurred, this is most likely due to a false memory which has been reconstructed via the
introduction of postevent information via media reports, social interactions and discussions with other individuals over time (Greenberg, 2004). In this research we posed a number of related questions: How is shared memory and the outcome for false memory affected by flashbulb events in the public domain? Are there similarities or differences in differing contexts, such as mundane event remembering (Chapter 2) and remembering events of 9/11 (Chapter 3)? And further what about the further effects of specific interpersonal constructs such as familiarity, trust, confidence and memory esteem and how it impacts flashbulb event remembering?

**Interpersonal Relationship Factors and Memory Distortion**

Social influence on another person’s memory is typically established via a co-witness, such as a bystander, another participant, a confederate, or someone who witnesses the same event and engages in the same or similar task as the participant. A common finding is that even when memories originate from another person, individuals often retain these memories as their own and believe them to have come from their own experience (McGuire, London, & Wright, 2011). Indeed, Hirst and Echterhoff (2012) found that remembering through a conversation (versus not speaking) reshapes individuals’ memory for the event. But, do such effects occur among strangers and familiar individuals alike?

Recently, researchers have examined the extent to which interpersonal familiarity and trust influences memory distortion, in the form of memory conformity and false memory. We view this as advancement, because early research had simply implied that friends or two individuals in a relationship were familiar with each other, without actually measuring familiarity or trust (Andersson & Rönngberg, 1995; French et al., 2008; Hope et al., 2008; Johansson, Andersson, & Rönngberg, 2000, 2005). We felt it was important to separately measure the effects of familiarity and trust, which are present to varying extents between
people. Further, we wanted to examine how these constructs would positively or negatively relate to memory distortion.

We (see Chapter 2) found that familiarity and trust ratings correlated with two types of memory conformity: corrective memory conformity and distortive memory conformity, for an everyday event. Distortive memory conformity occurred when an individual changed their original accurate memory in favour of their partner’s memory, and the resultant memory was less accurate. Corrective memory conformity occurred when an individual changed their original inaccurate memory in favour of their partner’s memory, and the resultant memory was more accurate. The outcomes for memory conformity were determined by the type of shared reminiscence (verbal discussion vs. non-verbal revision) involved. Verbal discussion of memory for a video clip elicited corrective memory conformity and distortive memory conformity; however, this finding did not occur when participants engaged in non-verbal, written revisions of a dyadic member’s memories for an event.

It has been argued that familiar dyadic collaboration results in positive outcomes for couples (Lewis, 2003). Research suggests that familiar dyads rely on one another’s memory for an event, possibly due to cognitive interdependence (Agnew, Van Lange, Rusbult, & Langston, 1998). Jaeger, Lauris, Selmeczy, and Dobbins (2012) found that individuals who viewed memory sources as reliable led to improvements in memory performance. Previous research suggests that although conformity to another person’s memory has negative consequences for eyewitness testimony and the criminal justice system, it may however be a logical, and possibly, even adaptive way for individuals to function within society in circumstances where we have substantial doubt in our own memory (Allan, Palli Midjord, Martin & Gabbert, 2012). Meegan and Berg (2002) have determined that within interpersonal relationships, collaboration can serve as a compensatory function, particularly in older adults. Certainly, the capacity to integrate another person’s viewpoint within one’s own is possibly a
critical attribute of all social cognition (e.g., Macrae & Bodenhausen, 2000). We were further interested in the interaction between the with the social effect of interpersonal familiarity and the metacognitive effect of intrapersonal confidence for memory details and its outcome for memory conformity as a result of shared verbal reminiscence.

Trust between group members who know each other, particularly in a dyad, the smallest of groups, effects how people retrieve memories for an event (Hope et al., 2008; French et al., 2008; Echterhoff, Hirst, & Hussy, 2005). A lack of trust can lead to lower levels of false memory following interaction between pairs of people, even when during transfer of postevent information (Neuschatz et al., 2007). Viewing a fellow group member as a credible source of information leads to susceptibility for memory contamination and encourages memory inaccuracies during social remembering (Brown et al., 2009). A credible trustworthy source can alter memories for an event substantially, due to a reliance and interdependence between pairs of people (Hirst & Echterhoff, 2012). Schneider and Watkins (1996) further suggested that people will trust somebody else’s memory for an event if the other person appears more confident in their own memory for that incident. Although research has found group members sharing retrieval of an event together recurrently remember more and better than individuals who are not in a group, they do not often reach the heights for memory accuracy of collective individual memory task scores (Basden, Basden, Bryner, & Thomas, 1997; Weldon & Bellinger, 1997).

Lindsay, Hagen, Read, Wade, and Garry (2004) showed how group members who know each other can (knowingly or unknowingly) implant false memories for events due to what they termed it the familial informant false narrative procedure. Peker and Tekcan (2009) investigated whether groups made up of friends have a more unified in-group composition would be more likely to demonstrate effects of false memory contamination compared to impromptu groups when they are asked to recognise and recall words from a wordlist.
Similar to Reysen (2005), they determined that distortive effects for memory are more prevalent among familiar friend groups than other group members, due to the effects of social influence and social pressure. Takahashi (2007) examined collaborative inhibition by contrasting friend and nonfriend groups by utilizing the DRM paradigm, and divergent from expectations, collaborative inhibition was evident among friend groups in addition to nonfriend groups (Takahashi, 2007).

**Memory Detail Confidence**

Memory confidence is a central variable in memory research, especially for flashbulb memories, therefore; confidence is central for examining memory conformity and for flashbulb events (Day & Ross, 2013; Talarico & Rubin, 2003). Wright and Villalba (2012) suggested that memory conformity depends upon how confident a person was in their own memory when it was a new memory. Memory distortion also relates to whether a person’s memory of an event was initially accurate or inaccurate (Wright & Villalba, 2012). Further, Goodwin, Kukucka, and Hawks (2013) reported that their participants reflected another person’s confidence level, signifying a memory confidence conformity effect. Discussion among highly confident dyads produced highly confident, but not more accurate, recognition of details. Conversation with unconfident dyads produced less confident recognition. Thus, previous research has evinced that individuals can be influenced by the confidence of another person, in particular when incorrect (versus correct) information is involved (Goodwin et al., 2013).

The relation between interpersonal familiarity and intrapersonal memory confidence is less clear. That is, highly familiar individuals in a dyad may be more open to admitting what they do and do not remember about an event, compared to individuals who are unfamiliar with each other. Two individuals who do not know each other at all may be more likely than two individuals who do know each other to exaggerate their confidence about past
event details. Conventional memory conformity experiments demonstrate how individuals are negatively influenced by peripheral social sources; hence, the manipulations typically involve situations in which misinformation distorts memory performance purposefully, such as by affiliates (Axmacher, Gossen, Elger, & Fell, 2010; Meade & Roediger, 2002; Reysen, 2005; Walther et al., 2002; Wright et al., 2008, 2000). Presently, it remains unknown how interpersonal familiarity and confidence influences conformity to another individual’s memory for a specific meaningful flashbulb event, such as 9/11. We posed the question: Does intrapersonal confidence and interpersonal familiarity predict memory conformity for flashbulb event details of 9/11 and if so; does this result in memory distortion or memory correction?

**Memory Esteem**

Researchers in the field of memory have extensively studied the effects of confidence on recognition memory, but what about a construct that could possibly measure something which differs from confidence in one’s memory, and is closer to a belief or esteem in memory? Some researchers (e.g., Talarico, LaBar, & Rubin, 2004) have considered memory confidence and belief as the same concept but we believe that these are varying concepts relating to memory with differing outcomes and hence, wanted to measure something different to both. Therefore, in the current research, we termed such a construct *Memory Esteem*. We define memory esteem as that which encompasses one’s worthiness in relation to their ability to remember past occurrences. There is research which is similar to what we were focused on which I will briefly review, though ultimately to the best of our knowledge this is a new concept being investigated in the context of social memory research.

It has been suggested, based on research findings, that altering one’s memorial response in favour of another person’s may be a reasonable, and perhaps even an adaptive way for individuals to exist and abide by social norms within the social environment, in
instances where a person is suspect and distrustful of their memory capability (Allan et al., 2012). It has been found that informational and social pressures can promote memory conformity between dyadic partners when individuals are uncertain and unsure of their memory ability and therefore, rely on another individual’s memory which they may view as more dependable and capable than their own (Carlucci et al., 2011). Earlier research has highlighted the influence of a participant’s own memory beliefs, and also the impact of their dyadic partner’s memory beliefs on shared memory, in which it was suggested that determining which memory narrative is correct is dependent on both the participant’s sense of ability in their memory and further, their opinion of their partner’s memory ability (Wright et al., 2010).

Subjective memory belief has somewhat overlapping similarities with our defined concept of memory esteem. Researchers have used questionnaires such as the Metamemory in Adulthood Questionnaire (MIA; Dixon, Hultsch, & Hertzog, 1987) and Memory Functioning Questionnaire (MFQ; Gilewski, Zelinski, & Schaie, 1990) to examine subjective memory beliefs in individuals. Subjective memory tools such as these have mainly been utilised in clinical situations, with consequent findings from these questionnaires being applicable to clinical populations, which are also normally used in concurrence with cognitive and neurological instruments (Troyer & Rich, 2002). The Memory Self-Efficacy Questionnaire (MSEQ; Berry, West, & Dennehy, 1989) measures somewhat similar and overlapping items to the items in our memory esteem scale. The MSEQ has been found to be a validated tool in the measure of efficacy in relation to one’s memory capability to complete aims and goals (Bagwell & West, 2008; Welch & West, 1995). Troyer and Rich (2002) developed a questionnaire called the Multifactorial Memory Questionnaire (MMQ) which has a section which encapsulates capability in reference to memory function, which again has some commonalities with our concept of memory esteem, though is ultimately different in
that it measures memory strategy and contentment also. We were not interested in such factors as part of our present research and further, the MMQ relates primarily to clinical settings also and not general adult populations, which was our population of focus.

The above discussed questionnaires were not applicable to our specific aim and objective/specific purpose of investigating memory conformity and false memory among dyadic members. Also, such subjective memory instruments, while having consistent reliability and validity, were not designed purposefully for dyadic reminiscence or distortive outcomes such as memory conformity or false memory. The use of those tools have mainly been researched in areas of gerontontology and cognitive decline, relating to old age (Cook & Marsiske, 2006). Consequently, as these questionnaires were not specifically or directly measured one’s sense of worth in their ability to remember the past, we proposed and developed our own scale for measuring memory esteem (see. Appendix D, section 5). We then proceeded to examine the influence of memory esteem on the outcomes of dyadic and individual’s reminiscence, specifically in recognition memory for meaningful event details of 9/11.

In sum, there is little empirical research which experimentally investigates the memory conformity and false memory outcomes following dyadic reminiscence for actual event details of a flashbulb event, such as memory for the terrorist attacks of September 11th, 2001. Therefore, we posed the questions: Are the effects witnessed with everyday memory recognition (Study 1) similar for a meaningful and emotional event such as 9/11? Further, how does one’s memory esteem influence if and to what extent an individual conforms to another individual’s memory for event details of 9/11? Lastly, does high memory esteem in ones memory for 9/11 lead to memory distortion outcomes which are negative, positive, or both?
The Present Research

The first goal of the present research was to demonstrate that memory distortion, specifically in the form of memory conformity and false memory, occurs among dyads for a flashbulb event. Much research to date has focused on autobiographical remembering and flashbulb memory, however; less research focuses on the accuracy and false memory incidences of the actual sequence of events which surround that fateful day of September 11th, 2001 (Hirst et al., 2009).

Based on Study 1 (Chapter 2) it is known that shared memorial reminiscence relates to memory conformity and false memory for recognition of everyday and mundane events (e.g. documentary details). If the event is of insignificance importance, people may not be very attached to their memories for the event, and memories may be manipulated readily (Loftus, 2003; Gabbert et al., 2003; Skagerberg & Wright, 2009). Previous research suggests that meaningful flashbulb events are not as susceptible to memory alteration, but rather are consolidated over time, in so far as many people remember precisely what they were doing and how they felt when they heard of surprising and shocking public events, such as the Challenger explosion, JFK’s assassination, Princess Diana’s death and most memorably, the 9/11 terrorist attacks (Weaver & Krug, 2004). Pezdek (2003) determined that flashbulb memories for event information are characterised by the degree of personal involvement and proximity to the event, and that in general, shocking events that occur in the public domain are more resistant to modification. That being said, there is contrasting evidence that discussion between individuals who know each other can encourage people to change even the most emotional, and closely held memories, such as those for 9/11 (Hirst et al., 2009; Coman et al., 2009).

Due to the nature of the strength of flashbulb memories (Brown et al., 2009; Echterhoff et al., 2005), in the context of reminiscing on the event details of 9/11, we
hypothesized that interpersonal familiarity and trust among dyadic members would separately correlate negatively with memory conformity, generally. Further, we hypothesized that the greater one’s own confidence in the flashbulb event details, the less they will conform to another person’s memory for the event. We were mainly interested in investigating the relationship between interpersonal familiarity, confidence, and shared memory. We assessed flashbulb memory conformity in two ways, distortive and corrective. Based on previous research that dyadic partners rely on the memories of someone whom they know (French et al., 2008; Hope et al., 2008), we expected that familiarity and trust would negatively predict corrective memory conformity and result in memory distortion. We predicted that confidence would negatively correlate with distortive memory conformity and result in memory correction, based on previous research on confidence and meaningful flashbulb memory (Talarico & Rubin, 2003).

Further, we were interested in exploring the vulnerability of flashbulb memories to the influence of memory esteem and its relationship with memory conformity which is corrective, distortive, or both. We further expected that memory esteem would negatively predict memory conformity and false memory occurrence. The relationship between memory esteem and corrective or distortive memory conformity was exploratory and an open question. Similarly, the effects of memory esteem on false memory are unknown therefore, using the Misinformation Paradigm (Loftus, 2003), we examined how often people would falsely recognise details due to supplying purposeful postevent misinformation and the resulting outcome for the misinformation effect (Loftus, 2003).

Method

Participants

One hundred and sixteen students (58 dyads) from the University of Limerick (78 women, 38 men; $Mage = 27.49$, $SD = 11.03$) participated in this study in return for chocolate.
Participants were assigned to either the PPI (purposeful postevent information) (n = 58) or the No PPI (n = 58) condition of a between-subjects design.

**Procedure**

Participants were recruited via email and were asked to undertake the task with a person with whom they knew. The task was undertaken in the presence of the experimenter or research assistant (all completed booklets were scored by the experimenter only). The participants were given a research booklet with two sections (1 and 2). Each section contained 16 recognition items and questions regarding event details from 9/11 (e.g., “Which tower was hit first?”; “Where was President George Bush at when he first heard of the attacks?”). Each item included multiple-choice response recognition options (See Appendix B for further items). Participants in the PPI condition were exposed to purposeful postevent information items (8 correct; 8 incorrect) relating to event details of 9/11.

Section 1 was an individual recognition test, which all participants completed independently and privately. Section 2 was the same recognition test; however, participants completed this individual recognition test following discussion of each item with their dyadic partner. They each rated their perceived confidence for their memory details for 9/11.

Participants in each group were instructed not to scribble out their original responses when proceeding from task section 1 to task section 2. Keeping visible their initial response(s) enabled us to code for a response change, either a corrective response or a distortive response. Finally, on their own, each participant privately completed brief measures of their familiarity and trust in their partner, along with a measure of memory esteem. We describe the materials below.

**Measures**

*Memory conformity*, the dependent variable, was measured as changing one’s own response in favor of a dyadic partner’s response in two ways: 1) Corrective memory
conformity was measured by how much each participant correctly altered their own response from their original response by adopting the response of their partner’s response, and 2) Distortive memory conformity was measured by how much each participant incorrectly altered their own response from their original response by adopting the response of their partner’s response.

False Memory was measured by the recognition of a detail which was incorrect in section 2 following dyadic discussion (e.g. North Tower of the World Trade Centre collapsed first). This way of measuring false memory is based on the misinformation paradigm (Loftus, 2003) and exposing the participants to purposeful postevent information (8 correct (for equality purposes only), 8 misinformation) regarding details of 9/11 and examining how this affected false memory. False memory was measured by false recognition of 9/11 event details which were not part of the occurrences or the reports on the day of the terrorist attacks or elements that were remembered incorrectly (inaccurate recognition) to what had actually occurred (e.g. incorrectly remembering seeing the first plane hit the North tower on the day of the attacks). Such postevent information is introduced readily in everyday conversation during shared reminisce of ordinary, mundane details in everyday life, but it also occurs during verbal conversation of meaningful public events, hence in this second study we investigated the outcome for false memory for this emotional, and not ordinary flashbulb event.

Interpersonal Familiarity, the first of two predictor variables, included six items that were each rated privately by all participants. An example item included, “How familiar are you with participant A/B?” (1 = not at all familiar, 2 = somewhat familiar, 3 = familiar, 4 = fairly familiar, 5 = very familiar, 6 = extremely familiar). Each item was set to a unique response scale; hence, we standardized responses to all items prior to analysis. Positive values represent above-average familiarity; negative values represent below-average
familiarity, and a value at zero reflects average perceived familiarity with one’s partner. In the present sample, the items evinced excellent inter-item reliability (Cronbach’s $\alpha = .96$; lower = .95, upper = .97).

Interpersonal Trust, the second predictor variable, included 11 items. All participants rated each item privately. An example item is, “If my alarm clock was broken and I asked participant A/B to call me at a certain time, I could count on receiving the call” (1 = strongly disagree, 6 = strongly agree). The items were adapted from the Specific Interpersonal Trust scale (Johnson-George & Swap, 1982), which also contained items that were adapted from the Interpersonal Trust Scale (Rotter, 1967). All items were set to the same response scale. The higher the scores the more trust a participant felt in one’s dyad partner. In the present sample the items evinced excellent inter-item reliability, Cronbach’s $\alpha = .98$; lower = .97, upper = .99.

Intrapersonal Memory Confidence was assessed via 16 items, each set to a 5-point scale (1 = not confident to 5 = very confident). The items evidenced excellent inter-item reliability for each interchangeable dyad member, person A (Cronbach’s $\alpha = .91$; lower = .88, upper = .94) and person B (Cronbach’s $\alpha = .92$; lower = .90, upper = .95). We computed the average of each participant’s confidence in one’s own memory details, and then we computed the average of the each average so that there was a single memory confidence index. Thus, higher scores reflect greater (versus poorer) confidence in one’s own responses to their memory of 9/11. Missing values were coded as 999 in SPSS.

Memory Esteem, a predictor variable, included 14 items that were each rated privately by all participants. Twelve items were used for scoring memory esteem (items 9 and 10 were not intended nor used for scoring, but rather for informational purposes only). Some example items included, “I sometimes doubt my memory”, “I believe I have a good memory” (1 = strongly disagree, 6 = strongly agree). All items were set to the same response scale,
however; six items were reverse scored (items 2, 4, 5, 7, 12, & 13), (Cronbach’s α = .77; lower = .77, upper = .78).

Results

Analytic Strategy

To test our hypotheses we analyzed the data in three stages. Using IBM SPSS 20, in the first stage we examined descriptive statistics and bivariate correlations among the study’s variables. In the second stage we tested linear regression models with memory conformity as the dependent variable, interpersonal familiarity as an independent variable, and in a separate model, with memory confidence as an independent variable. In the third stage, we tested two plausible mediation models via the Process macro (Hayes, 2013). We examined two models: primary Model 1 and alternative Model 2. In Model 1 we test the idea that interpersonal familiarity (in one’s research partner) negatively predicts memory conformity through intrapersonal memory confidence. In Model 2 we tested the idea that intrapersonal memory confidence negatively predicts memory conformity through interpersonal familiarity (in one’s research partner).

To test for evidence of mediation, we utilized the Process approach instead of the “causal steps” approach (Baron & Kenny, 1986). The causal steps approach requires that each path must achieve statistical significance prior to testing for evidence of an indirect effect; this is a limitation, because it is more prone to Type II errors, leaving researchers unaware of potentially or actually real effects (Hayes, 2009). The Process approach involves quantifying the indirect effect by multiplying the effect of $x$ on $m$ (path $a$) by the effect of $m$ on $y$ (path $b$), thus, $a * b$. One advantage of this approach is that it allows assessment of evidence of a process, even if the direct effect (path $c$) was not statistically significant initially (Hayes, 2009; Hayes & Preacher, 2013; Preacher & Hayes, 2004).
Next, the Process approach remedies a limitation of the Sobel test, which is a part of the causal steps approach. The Sobel test assumes that an indirect effect’s ($a^*b$) sampling distribution is normal; however, it frequently is not (Hayes, 2009). The bootstrapping techniques in Process do not assume that $a^*b$ is normal. The researcher establishes a confidence interval ($CI$) for the indirect effect, which acts as a significance test. When an indirect effect estimate does not pass through zero, the effect is statistically significant. For example, if an indirect effect for a model is estimated to be 0.05, and the 95% CI range is bounded by 0.00 on the low end and 0.10 on the high end, the indirect effect would be statistically significant. However, if the lower-bound is -0.00 and the upper-bound 0.10, the same 0.05 indirect effect would not be statistically significant. In all of the models that we tested in this study, we estimated the indirect effect produced from 1000 re-samples, and we evaluated it using a 95% bias-corrected confidence interval (95% CI), interpreted the same as $p<.05$. For each model, we reported: (1) the corresponding unstandardized indirect effect estimates, (2) the standard error for each indirect effect, (3) the lower- and upper-bound estimates that establish a 95% confidence interval around the estimate of each indirect effect (the significance test), and (4) each model’s $R^2$.

Finally, to account for the fact that our data were clustered (i.e., persons within dyads), at stages two and three we included into each model a nominal-level variable to account for each dyad. We controlled statistically for the possibility of between-dyad effects; hence, any statistically significant findings that we report from regression models cannot be due to possible idiosyncrasies between pairs of individuals.

**Descriptive Statistics**

Table 1 contains means and standard deviations for the independent and dependent variables in the study. Table 2 includes percentage change in recognition memory from
section 1 to section 2 of task (memory conformity). Table 3 contains Pearson’s $r$ correlations for the variables of interest in the study.

**Regression Analyses**

Table 4 contains significant linear regression (enter method) for corrective memory conformity, with familiarity, trust, and memory esteem as significant predictor variables. No significant model for distortive memory conformity emerged. Table 5 contains significant linear regression (enter method) for false memory, with trust, corrective memory conformity and distortive memory conformity as significant predictor variables.

**Mediation Analyses**

All models below control for between-dyad variance for interpersonal familiarity and intrapersonal confidence. The following two results examined evidence for Model 1. Interpersonal familiarity did not negatively predict corrective memory conformity through intrapersonal memory confidence, indirect = -0.06 ($S.E. = .07$), 95% CI = [-0.27, 0.05].

Interpersonal familiarity negatively predicted distortive memory conformity through intrapersonal memory confidence, indirect = -0.13 ($S.E. = .08$), 95% CI = [-0.36, -0.01], $R^2 = .08$.

The next two results examined evidence for Model 2. Intrapersonal memory confidence negatively predicted corrective memory conformity through interpersonal familiarity, indirect = -0.12 ($S.E. = .07$), 95% CI = [-0.32, -0.01], $R^2 = .09$. Intrapersonal memory conformity did not predict distortive memory conformity through interpersonal familiarity, indirect = -0.01 ($S.E. = .06$), 95% CI = [-0.18, 0.08].

**Main effects**

Table 6 contains significant mean differences for memory conformity and false memory for the purposeful postevent information (PPI) and no purposeful postevent information conditions, comparing correct PPI items separately to incorrect PP items (see
also Figures 1-6). Table 7 contains paired samples $t$ tests for corrective conformity, distortive conformity and false memory for the mean differences between correct and incorrect PPI items. Table 8 contains mean differences for memory conformity and false memory for comparison between everyday, ordinary memory recognition (Study 1, Chapter 2) and flashbulb memory recognition (Study 2, Chapter 3).

**Discussion**

We examined the relation between flashbulb memory and memory distortion in dyads. Specifically, we investigated the relationship of interpersonal familiarity, trust, memory confidence, and memory esteem with memory conformity and false memory, as a result of shared reminiscence of a meaningful flashbulb event, the 9/11 terrorist attacks. Further, we were primarily interested in testing the roles of interpersonal familiarity and confidence. Due to the uniqueness of flashbulb memories (Echterhoff et al., 2005), we expected that self-reported interpersonal familiarity among dyads would correlate negatively with memory conformity, generally. Although research suggests that flashbulb memories are impervious to change and individuals are reliant on emotional memoires of 9/11 (Pezdek, 2003), we expected some memory alteration in favour of another person, due to the power and pressure that results from verbal exchanges between individuals who know each other (Brown et al., 2009). However, the extent of such conformity to another person’s flashbulb memory was investigated and whether the outcome would be corrective or distortive for an individual.

**The Role of Familiarity and Trust**

As predicted, in the present study, memory conformity levels were evident but were generally low, relative to previous memory conformity findings for ordinary event reminiscence (see Chapter 2; Roediger et al., 2001, Wright et al., 2000). However, memory conformity did occur, which suggests that flashbulb memories are not steadfast, but may be
more persistent than non-flashbulb memories. This suggests that individuals may not easily give up or alter their meaningful memories for the details of 9/11 (whether accurate or inaccurate). Specifically, we found that self-reported interpersonal familiarity negatively predicted corrective memory conformity, indicating that the greater the familiarity between dyadic members, the greater the evidence of memorial inaccuracies. There was no significant relationship between familiarity and distortive memory conformity. Self-reported trust was also negatively related to corrective conformity, with similar outcomes as familiarity in that interpersonal trust related to memory distortion for meaningful flashbulb events. No significant relationship emerged between trust and distortive memory conformity. We termed the incidence of one dyadic member conforming to their partner's memorial account for flashbulb events Flashbulb Memory Conformity.

Echterhoff et al. (2005) suggests that people are protective of their memories but also that when they view a memory source as credible, such as a familiar and trusting dyadic partner, their guard is lowered. This could explain the negative relationship between familiarity, trust and corrective memory conformity. These findings concur with claims made by previous research that trustworthiness has a strong influence on memory contamination, due to reliance that people have on the memories of people they know (Echterhoff et al., 2005; Meegan & Berg, 2002).

Similar to the current findings that familiarity predicts memory distortion and negative outcomes for shared memory, Hope et al. (2008) established that familiar friend dyads were more at risk for reporting inaccurate postevent information acquired from their dyadic partner, which they had not experienced themselves. This resulted in reduced memory correctness via shared memory. Andersson (2001) determined that friend group members cue one another during collaboration, in order to support retrieval performance, particularly evident in the performance of friend group members compared to unfamiliar spontaneous
group members. Research by Takahashi (2007) compared the negative outcomes of collaborative inhibition among familiar friend and nonfriend groups by utilizing the Deese-Roediger-McDermott paradigm for formation of false memory. In contrast to similar research, collaborative inhibition was evident among friends in addition to nonfriends.

Alternatively, previous research findings also support the notion that shared memory can indeed result in beneficial outcomes for couples. Jaeger et al. (2012) determined that people who viewed memory sources as reliable due to an interpersonal relationship led to improvements in memory performance. Similar to this, it has been revealed that a reason for familiar dyads depending on one each other’s account of an event is probably due to cognitive interdependence and shared cognitive resources (Agnew et al., 1998).

Peker and Tekcan (2009) suggested that the negative effects of shared memory such as collaborative inhibition (in which group members remember less when remembering in a group) can possibly be reduced when group members know each other. The underlying reasoning behind such findings for collaboration is that a friend may provide more directed retrieval cues to other familiar members in a group or dyad than a stranger would group members than an unfamiliar person would (Basden et al., 1997). However, unlike the current findings the above research outcomes were not specific to memory conformity for meaningful, flashbulb events. Also, the research involved implied familiarity and trust among individuals who know each other, rather than a direct measurement of interpersonal familiarity and trust between dyadic partners.

**False Memory**

It was expected that there would be a positive relationship between familiarity and false memory, and separately, trust and false memory, though we expected there to be relatively low occurrences of false memory overall, due to previous evidence that people are protective of memories for meaningful and emotional flashbulb events such as 9/11 (Talarico
& Rubin, 2007). The results illustrated a significant positive relationship between trust and false memory but not between familiarity and false memory. These findings concur with claims made by previous research that trustworthiness has a strong influence on memory contamination, due to reliance that people have on the memories of people they know (Echterhoff et al., 2005; Meegan & Berg, 2002). Familiarity may not have significantly predicted an increase in false memory as it may not be as strong an indicator of impaired memory retrieval between dyadic members, as trust is. Trust between pairs of individuals may be a different and more powerful construct than familiarity (Echterhoff et al., 2005; Meegan & Berg, 2002).

As expected, although false memory was evident, it was relatively low, even though dyadic discussion is a powerful social process when it comes to shared memory of everyday events, though not so much with rigid, resolute and publically shared memories for memories of 9/11. However, Hirst et al. (2009), in a longitudinal study of memory for 9/11 in the USA, determined that even meaningful and vivid flashbulb events can be reconstructed and distorted due to the power of conversation between individuals. Similarly, Coman, Manier, and Hirst (2009) suggest that it is possible to forget or alter even emotional flashbulb memories as a result of the power of social influence and specifically, through conversation, due to a process known as retrieval induced forgetting (RIF).

**Purposeful Postevent Information**

Correct and incorrect item purposeful postevent information (PPI) were compared separately to controls (no PPI condition) and its effects on corrective and distortive conformity, along with false memory were analysed independently. Discussion of purposeful postevent information (PPI) had a significant effect on corrective conformity, for correct PPI items, more beneficial conformity in the no PPI condition than in the PPI condition. There was no significant main effect of PPI on distortive memory conformity for correct PPI items.
There was a significant main effect of PPI on distortive conformity for incorrect PPI items, with higher memory distortion in the PPI group than when no incorrect PPI was presented. Further, there was no significant effect of PPI on corrective conformity for incorrect PPI items. Within the PPI group, for the correct PPI items, there was more evidence of corrective memory conformity than distortive memory conformity. Also, within the PPI group for the incorrect PPI items, there was more distortive memory conformity than corrective memory conformity. These findings were expected and could be explained by the idea that discussion in itself provides a natural discourse for discussing postevent information and since all participants discussed their memories for the event with their dyadic partner, they were exposed to probable suggestive influences by way of verbal interactions (Hirst et al., 2009).

As expected, discussion of incorrect PPI items only had a significant main effect on false memory, with more false memory being evident when individuals were exposed to PPI. There was no significant effect of PPI on false memory for correct PPI items. This lends evidence to the argument that social and verbal interaction with another person after an event has occurred can distort accurate and inaccurate details, even for stressful and emotional memories that are meant to be more stalwart in memory (Loftus, 2003). Further, within the PPI group there was more false memory for the incorrect PPI items than the correct PPI items. This evidence of memory distortion and errors in the current research is similar to previous flashbulb research by McCloskey, Wible, and Cohen (1988) who established that retrieved memories for the Challenger space shuttle explosion were frequently changeable over time and vulnerable to inaccuracies. Schmidt (2004) ascertained that excessive levels of reconstruction of central features for flashbulb event memories are commonplace but also, contradictingly, there is further evidence for consistency for the memories for the event details.
The Role of Confidence

We hypothesized that the greater one’s own confidence in the flashbulb event details, the less they will conform to another person’s memory for the event. Our results suggest that when one dyadic member altered their flashbulb memory for the event, confidence was both positively related to corrective conformity and negatively related to distortive conformity for memory details for 9/11. Therefore, this resulted in beneficial outcomes for the accuracy of an individual’s flashbulb memorial account for the details of 9/11. Such a finding could be related to the confidence that individuals display for accurate memories; indeed, it is concurrent with previous memory conformity research (Goodwin et al., 2013; Jaeger et al., 2012; Wright & Villalba, 2012). Schneider and Watkins (1996) found that individuals will conform to another person’s memory of an event if that source is seen as credible and appears confident. However, Goodwin et al. (2013) found that discussion among highly confident dyads produced highly confident, but not necessarily more accurate, memories. Thus, previous research evinced that individuals can be influenced by the confidence of another person, particularly when incorrect (versus correct) information was involved (Goodwin et al., 2013).

According to Wright and Villalba (2012) memory distortion is reliant upon original memory confidence, with indecisive memories being more fallible than confident memories. In research by Higham, Luna, and Bloomfield (2011), evidence of accuracy-confidence dissociation was found, and additionally the influence of the effect of supplying misinformation was predominantly evident with fine-grained memorial responses, intimating that participant’s responses were based on remembered crime scene details. Day and Ross (2013) tested a model which comprised of confidence and its effect on flashbulb memories (specifically for Michael Jackson’s death) and found that over time confidence did not predict memory consistency, although it predicted the feeling of a social bond with the public event
target. Talarico and Rubin (2003) found that confidence predicted flashbulb memory, and that both everyday events and meaningful flashbulb events were vulnerable to alteration and deterioration over time. Conversely, they posed that vividness for flashbulb memory remained resolute over time.

Carlucci et al. (2011) advocated that social influence can enhance how often one person conforms to the memory of another person as a result of low confidence levels in their own accuracy levels and therefore, they rely more on the memory of someone they know rather than their own memory. Davis and Loftus (2007) in their research found that verbal feedback from a co-witness can promote memory distortion and influence a person’s confidence and subsequent memorial accuracy in a testimony. Previous research suggests that although conformity to another person’s memory is of negative consequence for eyewitness testimony and the criminal justice system, it may however be a logical, and possibly even an adaptive way for individuals to function within society in circumstances where we have substantial doubt in our own memory (Allan et al., 2012). Our findings serve to highlight the importance of confidence between familiar dyads because it appears that confidence in memory for the meaningful event that was 9/11 was what determined the accuracy for the event details. There was no significant relationship between confidence and false memory for event details of 9/11, which lends its support to research which has found beneficial outcomes for discussion of flashbulb memories between individuals, with little introduction of false memory, even with the provision of purposeful postevent information (Hirst et al., 2009).

**The Role of Memory Esteem**

In this study, we were intent on further exploring the susceptibility of flashbulb memories for the events of 9/11 to memory distortion and specifically, the influence of memory esteem on memory conformity. Further, the effects of memory esteem on false
memory are unknown therefore; we investigated how frequently individuals would falsely
recognise details surrounding 9/11 due to supplying purposeful postevent misinformation
(Loftus, 2003). As there is no direct research to review on memory esteem, we based our
hypotheses on the research findings of the most closely related constructs such as confidence,
subjective memory beliefs, and memory self-efficacy (Cook & Marsiske, 2006; Talarico et
al., 2004; Wright & Villalba, 2012). It was predicted that memory esteem would negatively
predict memory conformity, in that the more esteem a person had in their memory the lower
the evidence of conforming to someone else’s memory. However, the results ascertained that
memory esteem negatively predicted corrective memory conformity for discussing the
meaningful flashbulb events of 9/11, however; this relationship was not significant for
general or distortive memory conformity or false memory.

As memory esteem is a new construct, and it was also a fresh approach to test
memory conformity outcomes for flashbulb memory, there is limited research with which to
compare the findings. However, we have found that confidence, belief, and efficacy in one’s
memory are concepts which are possibly the most closely related to memory esteem. We
found that confidence and memory esteem were positively, though weakly related which
suggests that they may not necessarily be measuring the same element, as has been
determined by previous research (Talarico et al., 2004), but rather may be distinct aspects of
memory, that need to be measured separately. It is also possible that they have overlapping
items which lend to their significant relationship (Brewer & Day, 2005). Overall, the findings
of the current study (Study 2) attest to the possible positive outcomes for shared
reminiscence, as even with low levels of memory conformity there was, in general, more
corrective memory conformity than distortive memory conformity. This is possibly due to
both the fallible nature of human memory and the persuasive abilities of verbal
communication between individuals, in that emotional and shocking public events, especially
the sequence of events of 9/11, are susceptible to alteration (Coman et al., 2009; Hirst et al., 2009). This may also have been the case in our study, which involved discussion, and which saw low, but significant levels of conformity.

**Comparison of Study 1 and Study 2**

In Study 2, we expected that people’s memories for a flashbulb event such as 9/11 would be lucid and clear, but that discussion of the event details of this day, with a familiar and trusting dyadic partner, would affect these memories. That being said, we expected relatively low occurrences of memory conformity and false memory as people’s memories for emotional public events are relatively resolute, though the social and cognitive power of knowing a person certainly contributes to how a memory is reconstructed. Our findings supported this.

Overall, we found a difference in shared reminiscence and resultant false memory for relatively unimportant documentary detail remembering and flashbulb event remembering of 9/11. The main difference being that people are more attached and protective of their memories for meaningful events, though with the influence of interpersonal factors such as familiarity, trust, confidence, and memory esteem, we saw evidence that memory alteration can occur, but to lesser extents than in Study 1 with the Machu Picchu documentary.

The low levels of conformity and false memory evident in Study 2 is similar to research which has found that with the emotional involvement of publically experienced events and incursion of intense media coverage, particularly for details of 9/11 (the proposed strongest flashbulb memory in history to date), leads to such memories being special for individuals and that they are uncomfortable with these being altered (Talarico & Rubin, 2007). However, although memories for flashbulb events appear to be less changeable than memory for ordinary detail recognition; they are not steadfast as suggested by previous
flashbulb memory research conclusions (Kvavilashvili et al., 2003; Pezdek, 2003). In instances where they are relatively unchanged, it is with the reasoning that they are considered special because they concern events that are not ordinary or everyday by their nature, and typically are not personally experienced, but instead, they are emotionally charged (Neisser & Harsch, 1992). Christianson (1989) stated that the narrative material of flashbulb memories often remains relatively unchanged and intact although the memories for specific event details of a flashbulb encounter are often inconsistent.

Between Studies 1 and 2, which relate to ordinary event reminiscence and flashbulb event reminiscence respectively, there was only a significant difference in relation to corrective memory conformity, with more corrective alteration when the details were unimportant (documentary). There was no significant difference in distortive conformity between the two studies, supporting the premise that shared reminiscence, particularly via verbal conversation does not necessarily have negative consequences, and can similarly be applied to both non-flashbulb and flashbulb memories. Also, there was significantly more false memory with the documentary details than the flashbulb details, which suggests that possibly emotionally memories are not suite as easily influenced by another person as mundane details, due to being attached and protective of the event details on stressful public occurrences such as 9/11. This is similar to the findings of Smith, Bibi, and Sheard (2003) who found that emotion elicited accuracy for event details.

It has been suggested that it is not necessarily the actual flashbulb memory detail that individuals are protective of and which is important, it is the feeling and meaningfulness attached to that detail for the flashbulb event, hence; some flashbulb memories that individuals protect might in fact have been the experiences of others (Sheen, Kemp, & Rubin, 2006). Research also advises however that memory distortion does not always need to be associated with negative outcomes, but rather that these distortions in the form of illusions of
memory can have positive consequences for remembering, particularly in terms of self-protection and their adaptive power for future reasoning and planning (Howe, 2011; McKay & Dennett, 2009; Nairne, 2010).

Implications, Limitations, and Future Direction

There are implications for how people remember rich flashbulb events. It appears that, although discussion between dyadic members and the social pressure that may surround such interactions encourages some reconstruction, it is also clear that memories for meaningful events such as 9/11 and other publicly experienced events (accurate or inaccurate) are not as firmly planted in one’s memory as research has suggested. They may indeed be subject to alteration under the power social influence, the engagement with social dynamics and with the fallibility of human memory. It is important that individuals are aware that their significant memories for such events may be vivid, clear, and powerful, though they may also be inaccurate and reconstructed.

Even though, we manipulated the tasks and attempted to control for contextual variance, future research should include ratings for emotion and meaningfulness, specifically, for event details and not necessarily person, autobiographical memories. That being said, although we were not interested in autobiographical memory distortion in the form of memory conformity and false memory, some of the findings may be attributable to autobiographical memory as that is the nature of research into flashbulb memory. There is a well-researched connection between the resilience of flashbulb memory and the ability to remember autobiographical memory details (Pasupathi, Stallworth, & Murdoch, 1998; Weaver & Krug, 2004; Wright, 1998). There is indeed a close relationship between them and a difficulty in separating both, which we attempted to do in how we constructed our recognition items regarding details of 9/11.
It must also be noted that the findings could possibly be attributed to response conformity (Schneider & Watkins, 1996) rather than memory conformity, though we do not believe this is the case in this instance, as we took measures to ensure that section 1 of the task tested their memory of the details and the alterations in section 2 enacted a remembering in a way that altered their memory in favour of how their partner was remembering the details, which prompted the response. As we have reviewed the literature divided between those who argue that flashbulb memories are relatively unchanged and those who have found that they are malleable, like all memories, a further measure to determine how strong the individual original flashbulb memory is could be added. To ensure this and to further attempt to rule out response conformity, future research could involve further integration of confidence measures in the original memory, to indicate a real memory change when conformity does occur.

Although the current research is focused on shared memory and its outcome for memory distortion, the nature of autobiographical memory (AM) functioning cannot be ignored, and could be an explanatory factor for the variance in memory conformity in different contexts (9/11 recognition versus documentary video recognition). Semantic AM, such as that consistent with memories of personal flashbulb events (9/11), are more open to reconstruction, having been rehearsed over time (Talarico & Rubin, 2007). As memories of a documentary video such as Machu Picchu have not undergone such a time lapse and have not been subjected to repeated practise, apart from dyadic discussion or revision, this is consistent with episodic AM. Such episodic AM is more fallible and susceptible to reconstruction over time in contrast to semantic AM (Semkovska, Noone, Carton, & McLoughlin, 2012), and could account for the difference in memorial resistance to conformity and false memory between Studies 1 and 2. That being said, the power of social dynamics and interactions between dyadic members who know each other in relation to
memory recognition accuracy for both semantic and episodic memory cannot be ignored (Hirst & Meksin, 2008). Harris, Barnier, Sutton, and Keil (2014) found that individuals offset their unreliable episodic memory systems by eliciting the assistance offered by a dyadic partner during conversational remembering, and results in a beneficial outcome for shared memory.

It should also be documented that it may be possible the relationship between confidence and memory esteem could be due to them measuring the same construct. However, in relation to memory esteem, we constructed the items of the questionnaire to specifically measure something which was different from confidence, belief, or efficacy, but rather was something subjective relating to an individual’s sense of worthiness with regards their memory ability.

Conclusion

We attempted to elucidate the extent to which interpersonal relationship factors such as familiarity, trust, confidence, and memory esteem relate to conformity to another individual’s memory for a specific meaningful event, such as 9/11. Our results indicate that familiarity and trust distorts memory and highlights the negative consequences for conforming to someone else’s memory for a flashbulb event; memory confidence relates to memory correction and the positive outcomes for flashbulb memory conformity. Memory esteem negatively predicted corrective memory conformity; therefore, it had negative distortive outcomes for details of 9/11. Our results suggest that in the instances where an individual conforms to their dyadic partner, the result was beneficial for individuals who had lower levels of familiarity and trust with their partner; improved recognition of 9/11 details. It appeared that individual memory details (accurate or inaccurate) for 9/11 were important to them and were not altered to the extent that unimportant everyday details may be. However,
they were not impermeable, and via discussion, it appeared that these flashbulb memories could be altered.

Our findings add to the current memory conformity literature, specifically for the different corrective and distortive outcomes, and the relationship with interpersonal familiarity, trust, confidence, and memory esteem, as influenced by dyadic discussion. In all, these are significant contributions to the field of shared dyadic memory, specifically adding to research relating memory conformity with the meaningful and emotional effects of flashbulb memory in what we term flashbulb memory conformity.
Table 1

Means and Standard Deviations for Independent and Dependent Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Familiarity (standardized)</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Trust</td>
<td>57.06</td>
<td>9.17</td>
</tr>
<tr>
<td>Corrective Conformity</td>
<td>2.25</td>
<td>1.79</td>
</tr>
<tr>
<td>Distortive Conformity</td>
<td>2.02</td>
<td>1.45</td>
</tr>
<tr>
<td>False Memory</td>
<td>7.66</td>
<td>2.02</td>
</tr>
<tr>
<td>Confidence</td>
<td>43.02</td>
<td>13.40</td>
</tr>
<tr>
<td>Memory Esteem</td>
<td>48.57</td>
<td>4.53</td>
</tr>
<tr>
<td>Accuracy (before discussion)</td>
<td>8.03</td>
<td>1.94</td>
</tr>
<tr>
<td>Accuracy (after discussion)</td>
<td>8.25</td>
<td>1.96</td>
</tr>
</tbody>
</table>

Note: 3.3% Missing values for Confidence variable; other variables had 100% response rate.

Table 2

Percentage change in memory recognition from section 1 to section 2 (memory conformity)

<table>
<thead>
<tr>
<th>change in recognition</th>
<th>% change from inaccurate to accurate</th>
<th>% no change accurate to inaccurate</th>
<th>% change from accurate to inaccurate</th>
<th>% no change inaccurate to accurate</th>
</tr>
</thead>
<tbody>
<tr>
<td>memory from section 1 to section 2 of task (CC)</td>
<td>(CC)</td>
<td>(CC)</td>
<td>(DC)</td>
<td>(DC)</td>
</tr>
<tr>
<td>%</td>
<td>78.4</td>
<td>21.6</td>
<td>86.2</td>
<td>13.8</td>
</tr>
</tbody>
</table>

Note: CC = Corrective Conformity, DC = Distortive Conformity
Table 3

*Pearson’s r correlations for each study variable*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Familiarity</th>
<th>Trust</th>
<th>C-C</th>
<th>D-C</th>
<th>F-M</th>
<th>C</th>
<th>M-E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Familiarity</td>
<td>--</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trust</td>
<td>-0.71***</td>
<td>0.24*</td>
<td>0.13</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C-C</td>
<td>-0.42*</td>
<td>-0.24*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D-C</td>
<td>0.06</td>
<td>0.11</td>
<td>0.05</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F-M</td>
<td>0.13</td>
<td>0.31***</td>
<td>-0.26*</td>
<td>0.19*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confidence</td>
<td>0.23*</td>
<td>0.19*</td>
<td>0.26*</td>
<td>-0.17*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M-E</td>
<td>0.19*</td>
<td>0.12</td>
<td>-0.20*</td>
<td>0.06</td>
<td>0.01</td>
<td>0.26*</td>
<td></td>
</tr>
</tbody>
</table>

*Note:* ***$p < .0005$, **$p < .005$, *$p < .05$, C-C = Corrective Conformity, D-C = Distortive Conformity, F-M = False Memory, C = Confidence, M-E = Memory Esteem

Table 4

*Linear regression table (enter method) for predictor variables of corrective memory conformity*

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>$\beta$</th>
<th>t</th>
<th>df</th>
<th>CI</th>
<th>$R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Familiarity</td>
<td>-0.12</td>
<td>0.03</td>
<td>-0.35</td>
<td>3.93***</td>
<td>115</td>
<td>-0.15--0.05</td>
<td>0.11</td>
</tr>
<tr>
<td>Trust</td>
<td>-0.04</td>
<td>0.01</td>
<td>-0.24</td>
<td>2.62*</td>
<td>115</td>
<td>-0.06--0.01</td>
<td>0.06</td>
</tr>
<tr>
<td>Memory Esteem</td>
<td>-0.08</td>
<td>0.04</td>
<td>-0.20</td>
<td>2.14*</td>
<td>115</td>
<td>-0.14--0.01</td>
<td>0.03</td>
</tr>
<tr>
<td>Confidence</td>
<td>-0.02</td>
<td>0.01</td>
<td>-0.19</td>
<td>2.01*</td>
<td>115</td>
<td>-0.05--0.00</td>
<td>0.04</td>
</tr>
</tbody>
</table>

*Note:* ***$p < .0005$, **$p < .005$, *$p < .05$
Table 5

Linear regression table (enter method) for predictor variables of false memory

<table>
<thead>
<tr>
<th>Variable</th>
<th>$B$</th>
<th>$SE, B$</th>
<th>$\beta$</th>
<th>$t$</th>
<th>$df$</th>
<th>$CI$</th>
<th>$R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trust</td>
<td>0.04</td>
<td>0.02</td>
<td>0.25</td>
<td>2.76**</td>
<td>115</td>
<td>0.1-.07</td>
<td>0.06</td>
</tr>
<tr>
<td>CMC</td>
<td>-0.31</td>
<td>0.10</td>
<td>-0.27</td>
<td>2.95**</td>
<td>115</td>
<td>-.51-.10</td>
<td>0.04</td>
</tr>
<tr>
<td>DMC</td>
<td>0.28</td>
<td>0.13</td>
<td>0.19</td>
<td>2.09*</td>
<td>115</td>
<td>.02-.54</td>
<td>0.07</td>
</tr>
</tbody>
</table>

Note: ***$p < .0005$. **$p < .005$. *$p < .05$
Table 6

Main differences of postevent information condition (correct and incorrect PPI items compared to controls separately) for corrective and distortive conformity and false memory

<table>
<thead>
<tr>
<th>Variable</th>
<th>Condition</th>
<th>M</th>
<th>SE</th>
<th>F</th>
<th>df</th>
<th>η²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrective Conformity (for correct PPI Items)</td>
<td>No PPI</td>
<td>1.74</td>
<td>0.16</td>
<td>6.22*</td>
<td>(1,114)</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>PPI</td>
<td>1.15</td>
<td>0.16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distortive Conformity (for correct PPI items)</td>
<td>No PPI</td>
<td>0.79</td>
<td>0.09</td>
<td>1.94</td>
<td>(1,114)</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td>PPI</td>
<td>0.60</td>
<td>0.09</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrective Conformity (for incorrect PPI items)</td>
<td>No PPI</td>
<td>0.55</td>
<td>0.10</td>
<td>0.76</td>
<td>(1,114)</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>PPI</td>
<td>0.67</td>
<td>0.10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distortive Conformity (for incorrect PPI items)</td>
<td>No PPI</td>
<td>1.19</td>
<td>0.14</td>
<td>4.95*</td>
<td>(1,114)</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>PPI</td>
<td>1.64</td>
<td>0.14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>False Memory (for incorrect PPI items)</td>
<td>No PPI</td>
<td>3.65</td>
<td>0.27</td>
<td>14.74***</td>
<td>(1,114)</td>
<td>0.11</td>
</tr>
<tr>
<td></td>
<td>PPI</td>
<td>5.10</td>
<td>0.27</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>False Memory (for correct PPI items)</td>
<td>No PPI</td>
<td>3.33</td>
<td>0.25</td>
<td>2.25</td>
<td>(1,114)</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td>PPI</td>
<td>2.79</td>
<td>0.25</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: PPI = Purposeful Postevent Information

***p < .0005. **p < .005. *p < .05.
Table 7

*Paired samples t-tests for mean differences between correct and incorrect PPI items within the PPI group of participants, in relation to corrective conformity, distortive conformity, and false memory.*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Condition</th>
<th>M</th>
<th>SE</th>
<th>t</th>
<th>df</th>
<th>CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C-C Correct PPI</td>
<td>1.64</td>
<td>0.15</td>
<td>2.64*</td>
<td>57</td>
<td>0.1-0.8</td>
</tr>
<tr>
<td></td>
<td>Incorrect PPI</td>
<td>1.16</td>
<td>0.15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>D-C Correct PPI</td>
<td>0.67</td>
<td>0.10</td>
<td>5.92***</td>
<td>57</td>
<td>0.6-1.3</td>
</tr>
<tr>
<td></td>
<td>Incorrect PPI</td>
<td>1.64</td>
<td>0.15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>False Memory</td>
<td>Correct PPI</td>
<td>2.79</td>
<td>0.22</td>
<td>5.68***</td>
<td>57</td>
<td>1.5-3.1</td>
</tr>
<tr>
<td></td>
<td>Incorrect PPI</td>
<td>5.10</td>
<td>0.27</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: ***p < .0005. **p < .005. *p < .05. C-C = Corrective Conformity; D-C = Distortive Conformity*

Table 8

*Paired samples t-tests of mean differences between Study 1 and Study 2*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Condition</th>
<th>M</th>
<th>SE</th>
<th>t</th>
<th>df</th>
<th>CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>False Memory</td>
<td>Everyday memory</td>
<td>2.88</td>
<td>0.13</td>
<td>18.46***</td>
<td>99</td>
<td>4.2-5.2</td>
</tr>
<tr>
<td></td>
<td>Flashbulb memory</td>
<td>2.72</td>
<td>0.15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>C-C Everyday memory</td>
<td>3.78</td>
<td>0.35</td>
<td>4.69***</td>
<td>99</td>
<td>2.6-1.1</td>
</tr>
<tr>
<td></td>
<td>Flashbulb memory</td>
<td>1.93</td>
<td>0.17</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>D-C Everyday memory</td>
<td>1.94</td>
<td>0.15</td>
<td>0.91</td>
<td>99</td>
<td>0.2-0.5</td>
</tr>
<tr>
<td></td>
<td>Flashbulb memory</td>
<td>2.11</td>
<td>0.14</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: ***p < .0005. **p < .005. *p < .05. C-C = Corrective Conformity; D-C = Distortive Conformity*
Figure 1. Significant main effect of purposeful postevent information on corrective memory conformity (for correct PPI items)
Figure 2. Significant main effect of purposeful postevent information on distortive memory conformity (for incorrect PPI items)
Figure 3. Significant main effect of purposeful postevent information on false memory (for incorrect PPI items).
Figure 4. No significant main effect of purposeful postevent information on false memory (for correct PPI items).
Figure 5. No significant main effect of purposeful postevent information on distortive memory conformity (for correct PPI items).
Figure 6. No significant main effect of purposeful postevent information (for incorrect PPI items) on corrective memory conformity.
Chapter 4 (Study 3)

Image Recording Technology and Memory Conformity: Impact of Dyadic Trust and Memory Esteem on Shared Reminiscence
Abstract

Visual record keeping can be by means of a small digital camera (SenseCam TM used in the current research), worn around a user’s neck, which captures images in response to sensors which are sensitive to light and temperature changes. To date, such image recording technology has predominantly been used in clinical research, as an assistive tool for patients with memory decrement and impairments. We proposed using image recording technology to examine memory conformity (corrective and distortive) differences as a result of either wearing such a recording device or not. We were also interested in the interaction of interpersonal trust and memory esteem with wearing this device and its outcome for shared recognition of a task reflective of one which would be encountered in everyday life. To our knowledge, visual record keeping has not been used in shared memory conformity research. We found that trust positively predicted memory conformity, but only corrective memory, therefore; attesting the possible positive outcomes for conformity to the memory of another person. Memory esteem negatively correlated with corrective conformity. We also found a significant effect of wearing the recording device, in that memory conformity levels were lower in the group that wore the device, therefore; suggesting some positive outcomes of engaging with image recording technology. The findings are discussed in terms of implications for the use of image diary technology, which is becoming more accessible to people, specifically in areas such as law and judicial settings and police questioning. 

Keywords: Image Recording Technology, SenseCam TM, Dyads, Interpersonal Trust, Memory Esteem, Memory Conformity
Visual record keeping is by way of a small digital camera (SenseCam™), which contains a number of different embedded sensors and is worn via a lanyard around a user’s neck (Doherty, Moulin, & Smeaton, 2011). It automatically takes a sequence of motionless images whilst being worn, along with recording other facets of life events such as temperature, light levels, and movement (Hodges et al., 2006). Such an image recording device, unlike a regular digital camera or a camera phone, does not have a viewfinder or a display that can be used to frame photos. Instead, it is fitted with a wide-angle fish eye lens that maximizes its field-of-view (Hodges et al., 2011). This ensures that nearly everything in the wearer’s view is captured by the camera.

To date, it has predominantly been used in clinical research, specifically in brain injury rehabilitation, and has not been widely utilized or applied to non-clinical populations. In its research with supporting memory impairments, studies have focused on how it can be a tool to support memory retrieval (Sellen, Fogg, Aitken, Hodges, Rother, & Wood, 2007). As a tool for supporting memory, patients can view previous encountered images and has been successful in people remembering the feelings and thoughts surrounding such images, that they would not be as successful with previously used written diary accounts of events (Browne et al., 2011).)

One of the earliest studies to utilize such visual recording technology as a memory tool was that of Berry et al. (2007) and the case of ‘Mrs. B’ who had suffered amnesia and memory impairment, as a result of limbic encephalitis. The patient used the SenseCam™ as a pictorial diary by watching the images on a fast slide show like a movie, after having worn the device. The control condition in this study was a written diary but it was found that following engagement with the recorded diary images, Mrs. B was able to recall past events.
(80%) and her autobiographical memory, such as feelings and emotions surrounding the event (Berry et al., 2007). Browne et al. (2011) had similar success in memory retrieval for a patient with specific memory retrieval deficits with almost twice as many details remembered as the alternative of using a written diary as a memory support tool.

Recently, image keeping technology has been used as a tool for life logging, where people document everyday events using this passive, image recording device (Nguyen et al., 2009; Gemming, Doherty, Kelly, Utter, & Ni Mhurchu, 2013; Kerr et al., 2013). There is always an ethical concern about active and live recording and it has been compared to CCTV but specifically that concerns may be alleviated when people who are secondary to the use of such record keeping are truly informed and not just notified of the proceedings of use (Nguyen et al., 2009). Research suggests that this is a tool which can be utilized in many areas of life, for documenting up to 60 years of recorded daily events which can later act as a memory cue for looking into incidents of the past, and this is fast becoming a common way to utilize image diary technology (Sellen et al., 2007).

We propose that this technology can further be utilized as a tool to make people more aware and cognisant of their memories, in that people may pay more attention to what they are seeing, when they are aware that all their encounters are being recorded as measurable images. Human memory retrieval, by its nature is highly susceptible to contamination (Loftus, 2003). The digital camera worn as part of visual record keeping can act as a device to make people extra vigilant to how they retrieve their memories when needed to do so, which could be applied to many everyday areas of life, like school, college, work place, and the judicial system particularly eyewitness testimony. It can in this way also make more people aware of the fallibility and reconstructive nature of human memory, of which many lay people are unaware (Nguyen et al., 2009). The image recording device can be specifically used as a measure of the social interactive effects of shared dyadic reminiscence. To the best
of our knowledge, there has been no empirical research to date which has applied the use of image keeping technology to the major concerns for distortive outcomes for shared reminiscence, such as memory conformity.

Memory conformity occurs when one person, usually unintentionally adopts the memory of another person, often following discussion of postevent information (Gabbert, Memon, & Allan, 2003). This is most evident during eyewitness testimony reports. There are many elements which have been found to increase and decrease the occurrences of memory conformity between dyadic members, such as confidence, source credibility, age (Skagerberg & Wright, 2009). Memory conformity is particularly susceptible to the effects of postevent information, specifically misinformation, which people can encounter through the media, through reading about events, or naturally, through discussion with another person (Loftus, 2003).

The misinformation effect can lead to very different recall of events for different people, based on purposeful leading questions and/or suggestion which a person is exposed to (Zhu et al., 2013). Familiarity and trust are constructs which can have more recently been studied in relation to memory distortion, reinforcing the misinformation effect and specifically the consequences for memory conformity (see Chapter 2; French, Garry, & Mori, 2008). They have been found to increase how often one person conforms to the memory of another person, and are subsequently confident that the memory is their own (Hope, Ost, Gabbert, Healey, & Lenton, 2008; Harris, Patterson, & Kemp, 2008).

High Trust, in particular, has been found to increase one person’s reliance on the memory of another, when the person views the source as credible and reliable (Echterhoff, Hirst, & Hussy, 2005). A lack of trust can lead to lower levels of memory conformity between dyadic members (Neuschatz et al., 2007). Due to the limited empirical specific research directly related to the effects of dyadic trust and specifically in regards to using
visual recording technology, this research will focus on trust as a measure of dyadic memory conformity which research suggests has a powerful effects on memory retrieval, due to people seeing memory source as something they can depend on for accurate memory retrieval of an event, particularly one shared with another person (Hirst & Echterhoff, 2012). We are interested in the specific interaction between trust and wearing an image recording device and the impact it has for resultant memory contamination. Further, we are interested in whether this memory distortion always results in negative consequences or possible positive consequences for shared dyadic memory.

In Study 2 (Chapter 3) of the current research we proposed and defined a new concept called Memory Esteem as that which encompasses one’s worthiness in relation to their ability to remember past occurrences. Group influences can foster memory conformity between individuals in dyad when people are unsure of their own memory worth and ability and they rely on another person’s memory which they view as being more credible than their own version of past events (Carlucci et al., 2011; Gabbert et al., 2007). The Multifactorial Memory Questionnaire (MMQ; Troyer & Rich, 2002) is an instrument which is somewhat similar to elements of memory esteem such as capability, though it differs from what we were focused on in relation to memory esteem as it measure memory strategy and content in one’s memory also (Troyer & Rich, 2002). This questionnaire was created to directly measure such memory elements in clinical appraisal settings and not specific to normal functioning memory in adults, which was what we were primarily interested in.

Other questionnaires which are somewhat similar to memory esteem, though definitively different, are the subjective memory measures such as the Memory Functioning Questionnaire (MFQ; Gilewski, Zelinski, & Schaie, 1990) and Metamemory in Adulthood Questionnaire (MIA; Dixon, Hultsch, & Hertzog, 1988). Research to date has utilised such questionnaires mainly in hospital, after care, and home care settings, specifically for elderly
individuals with evidence of cognitive decline. The Memory Self-Efficacy Questionnaire (MSEQ; Berry, West, & Dennehy, 1989) also has some overlap with our concept of memory esteem in that efficacy is related to a sense of worth, though its measurements were not exactly what we wanted for the current research and was also designed with clinical populations in mind. Therefore, rather than utilising any of the above measures for our concept of memory esteem, we designed our own instrument based on our population and context of interest, with items which were specific to what we wanted to know (see. Appendix D, section 5)

Research to date has predominantly found that memory conformity results in detrimental outcomes for remembering (Andersson & Rönnberg, 1995; French et al., 2008), though there is research which has found that the beneficial alternative is the case (Agnew, Van Lange, Rusbult, & Langston, 1998). When people alter their memory in favour of another person, and this results in a memory going from inaccurate to now being correct, this is referred to as corrective memory conformity, and when the opposite occurs this is referred to as distortive memory conformity (See Chapter 2). We were specifically interested in the outcomes for memory distortion and what effect wearing a passive visual recording device would have on people’s resultant memory conformity, and how it would interact with interpersonal trust and memory esteem.

The Present Research

The aim of the present research was to explore applications of visual recording technology on normal memory function, specifically shared memory unrelated to brain injury or to clinical populations. The objective was to use a visual recording device (SenseCam TM) as a tool that can be also applied to everyday use in many diverse areas of life, especially since manufacturers of such recording devices have significantly reduced the cost of the device and made it more readily available. This study proposes a fresh approach to the field
of shared dyadic memory, specifically memory conformity research. The image recording device acts as an actual measure of the effects of shared memory in everyday life, with a non-clinical population.

We expected that wearing such an image capturing device would result in lower levels of memory conformity than not wearing an image capturing device. This prediction is based on previous research (Doherty et al., 2012; Hodges et al., 2011) which suggests that wearing a visual recording device makes people much more careful and cued in to what they remember and also, makes them cognisant that someone else will know whether they are answering as they remember or alternatively, are adopting the memory of their dyadic partner (conforming). We envisaged that when it did occur that it result in more corrective memory (beneficial outcome) than distortive memory conformity (negative outcome).

We manipulated trust and hypothesised that high trust between dyadic members would predict more overall memory conformity than low trust between dyadic members. We further expected two types of memory conformity: corrective memory conformity and distortive memory conformity, as an effect of dyadic trust. We expected that wearing a record keeping device would be a way to reduce the occurrence of memory conformity between dyadic members. We predicted an interaction between an image capturing device and trust and its effect on memory conformity.

The previous study (Study 2, Chapter 3) focused on the relationship between memory esteem and memory conformity for the meaningful flashbulb memories of 9/11. The current study (Study 3) follows on from that and is designed to examine memory for everyday tasks and interactions, along with the introduction of image recording technology as a recorded measure of these tasks, and as a possible tool for reducing memory conformity, especially when interacting with high levels of memory esteem. Visual recording technology has only very recently moved away from clinical, hospital based research on patients with memory
deficiencies (Browne et al., 2011) onto normal memory function, such as in family interactions evident through life logging (Nguyen et al., 2009; Kerr et al., 2013). In the current study, we were interested in the effects of memory esteem on memory recognition for ordinary daily tasks, and how it interacts with wearing an image recording device in increasing or reducing the consequences for memory conformity. Specifically, we investigated whether these outcomes would be positive, negative, or both in the form of corrective and distortive memory conformity.

Method

Participants and Design

Forty students (20 dyads) from the University of Limerick (21 women, 19 men; \( M_{\text{age}} = 22.73, SD = 5.47, max = 41, min = 18 \)) participated in this study in return for chocolate. Participants undertook the experiment in pairs (dyads) with a person whom they did not know. Participants were randomly assigned to the conditions of a 2 (Wearing an Image Recording Device vs. Not Wearing an Image Recording Device) \( \times \) 2 (High Trust vs. Low Trust) factorial design.

Materials and Procedure

Participants came to the laboratory in pairs; each participant with another person whom they did not know (organised by the experimenter). Participants were randomly assigned to one of two groups: Participants in group 1 were given a SenseCam TM (ViconRevue) to wear and were instructed to undertake 10 short tasks (20 minutes duration approximately) on campus at University of Limerick, whilst wearing it. The tasks contained instructions to go to a building on campus and to make a mental note of a number of features and items in art galleries and historic collections (see Appendix C). Participants in group 2 did not wear a SenseCam TM and undertook the exact same tasks.
Upon returning to the lab, all participants received a research booklet with 2 sections, each containing 14 items (see Appendix D). This was a recognition task. These items were multiple choice or true/false response items. All items contained purposeful postevent information regarding the on campus tasks (7 correct (for equality purposes only); 7 incorrect). Section 1 was completed alone, in private. Section 2 was completed by discussing each item with their dyadic partner and then individually completing the same recognition items again following discussion. The purpose of the initial recognition task (section 1) was to serve as a means to measure memory conformity, in that memory conformity was measured by how much the participants changed their responses from section 1 (individual recognition) to section 2 (individual recognition following discussion).

The memory task was at all times the same recognition test (sections 1 and 2). The same purposeful postevent information was present at all times, and the participants had to choose the answers they believed were correct. All participants were instructed not to scribble out their original responses when moving from section 1 to section 2, so that we could code for a change to a corrective response versus a change to a distortive response. The visually recorded images further supported the occurrence of memory conformity (further details in the measure section below).

Trust was manipulated by the experimenter by randomly allocating half the participants to the high trust condition (N = 20) and half of the participants in the low trust condition (N = 20). High trust (assigned group 2) was manipulated by telling dyad members (in private whilst they were in separate rooms) that their partner had been diagnosed with a vivid photographic memory some time back. Low trust (assigned group 1) was manipulated by telling dyadic members that their dyadic partner had reported that they suffer from memory loss as a result of a previous head injury. This information was imparted upon each member returning to the lab following the instructed task, but before completing the written
tasks, so as to avoid the dyad members possibly discussing it with each other while they were alone. Finally, following sections 1 and 2, each participant also completed a self-reported measure of trust and an individual memory esteem measure (see Measures section below for details).

Measures

Memory Conformity was measured in two ways: 1) Corrective memory conformity was measured by how much each participant altered their own response from their original response by adopting the response of their dyadic partner (following discussion with their partner), and the change in response was correct (i.e., a detail that a person did not remember initially was recognised in their partner’s response). 2) Distortive memory conformity was measured by how much each participant altered their own response from their original response by adopting the response of their partner (following discussion with their partner), and this response was then incorrect. General conformity was measured as any change in memory recognition from section 1 to section 2, in favour of a dyadic partner, regardless of whether it was accurate or inaccurate.

Visually Recorded Images were viewed by uploading them to the ViconRevue desktop via usb cable to the SenseCam TM hardrive (irremovable) and viewing the images (dated and timed) in either a continuous slideshow or as individual images. Images were coded by dyad and group numbers which corresponded to the dyad and group numbers on the research booklets and their codes in SPSS. The duration of each set of images ranged from 18 minutes to 45 minutes. This image recording technology acts as a supportive measure of memory retrieval and serves as an objective record as to what occurred and what the participants viewed and later retrieved during the instructed tasks.

Interpersonal Trust, the self-reported measure, contained 11 items. All participants rated each item privately. An example item is, “If my alarm clock was broken and I asked
participant A/B to call me at a certain time, I could count on receiving the call” (1 = strongly disagree, 6 = strongly agree). The items were adapted from the Specific Interpersonal Trust scale (Johnson-George & Swap, 1982), which also contained items that were adapted from the Interpersonal Trust Scale (Rotter, 1967). All items were set to the same response scale. The higher the scores the more trust a participant felt in one’s dyad partner. In the present sample the items evinced excellent inter-item reliability, Cronbach’s α = .976; lower = .97, upper = .99.

Memory Esteem, a predictor variable, included twelve items that were each rated privately by all participants. Some example items included, “I sometimes doubt my memory”, “I believe I have a good memory” (1 = strongly disagree, 6 = strongly agree). All items were set to the same response scale, however; six items were reverse scored (items 2, 4, 5, 7, 12, & 13), (Cronbach’s α = .79; lower = .78, upper = .81).

Results

Means and Correlations

The means and standard deviations for the variables of interest are contained in Table 1. Table 2 includes percentage change in recognition memory from section 1 to section 2 of task (memory conformity) and Table 3 contains Pearson’s r correlations for the variables in the study.

Main Effects

Table 4 contains mean differences for image recording condition (No SenseCam vs. SenseCam) and trust condition (High Trust vs. Low Trust) for general, corrective, and distortive memory conformity (also see Figures 1, 2, and 3). Table 5 contains a paired samples t-test of mean differences between corrective and distortive memory conformity in the study. Table 6 contains a paired samples t-test of mean differences between accurate individual memory recognition and inaccurate individual memory recognition.
Regression Analyses

Tables 7 and 8 contain significant linear regression models (enter method) for general and corrective memory conformity. No significant model for distortive memory conformity emerged.

Discussion

We expected that wearing a visual recording device such as SenseCam TM would result in lower levels of memory conformity than not wearing a visual recording device. This hypothesis was supported and we found that participants in the Wearing an Image Recording Device group conformed to their dyadic partner significantly less often than those in the Not Wearing an Image Recording Device condition. We suggest that this is because when people are more aware that their memories are being continuously recorded, they are more aware of what they are seeing and that someone else will be viewing what they saw. Therefore, they would feel that the experimenter would know if they were conforming to the answer of their dyadic partner or recognising an item based on how they actually, genuinely remember it. It may encourage people to be somewhat more honest in the response they choose (Doherty et al., 2011).

We forecasted that when conformity did occur, the result was more corrective memory (beneficial outcome) than distortive memory conformity (negative outcome). This was indeed evident from the findings. Overall, there were greater occurrence of corrective memory conformity than distortive memory conformity, therefore; there are positive outcomes for shared reminiscence between dyadic members, whether they were wearing a visual recording device or not. This finding supports similar research which has found that dyads often compensate each other during retrieval as a result of cognitive interdependence (Saczynski, Margrett, & Willis, 2004; Wegner, Guiliano, & Hertel, 1985).
Our findings supported our hypothesis that high trust would result in higher levels of memory conformity that low trust. We found that trust positively predicted general memory conformity (change in one’s memorial response) and corrective memory conformity, but did not predict distortive memory conformity. Again, this supports the argument for a beneficial outcome for when conformity does occur; it does not necessarily have detrimental consequences for shared memory. It has been suggested that the relationship between trust and reliance of another person’s memory is due to seeing this person as a credible source of which to accept their memory of the event rather than your own (Hirst & Echterhoff, 2012). Harris, Barnier, Sutton, and Keil (2014) found that shared memory was successful when intimate couples conversationally collaborated on everyday memory tasks.

We witnessed a significant interaction of trust and Wearing an Image Recording Device and its effects on corrective memory conformity. Therefore, those in the High Trust, Not Wearing an Image Recording Device had more positive outcomes for memory conformity than participants in the Low Trust, not Wearing an Image Recording Device, High Trust, Image Recording Device, and Low Trust, Image Recording Device groups. Therefore, such image capturing technology could be used as a tool to reduce memory distortion between dyadic members for the purposes of shared memory retrieval. That being said, the more a person trusts in the memory of a person, the more they are likely to conform to them, but this can be reduced with the support of a device such as SenseCam TM.

It was expected that memory esteem would negatively predict memory conformity for recognition of items which was reflective of a daily task (i.e. going to an historic building and encountering information regarding paintings, writers, artists, historical landmarks), particularly when wearing a visual record keeping apparatus (SenseCam TM), which has been found to act as an assistive tool for decreasing memory conformity during shared recognition. Consistent with the hypothesis, the findings confirmed this, though memory
esteem was only negatively related to correct memory conformity. Therefore, when the levels of conformity did occur, with wearing an image recording device, they were further related to lower occurrences when one’s memory esteem was high. Memory esteem and image recording device condition (wearing one vs. not wearing one) were significant predictors of general conformity and corrective conformity, but not distortive conformity. However, as some memory conformity was evident regardless, this may attest to the social and influential power of discussion between dyadic members, even when memory esteem is high (Gabbert et al., 2003; Paterson & Kemp, 2006; Loftus, 2003; Roediger et al., 2001).

In viewing the images associated with each individual device and their interactions with their dyadic partner, it was of assistance to view the images as a slide show and witness their interactions on the ordinary, everyday task and then witness the outcome for memory conformity when they later engaged in shared memory recognition in the lab. Overall, the findings attest to the beneficial outcome for wearing an image capturing device for the purposes of recognition accuracy, even with interpersonal dyadic influences, with more accurate recognition than inaccurate recognition, and more corrective than distortive conformity evident from the findings in general.

We found that wearing a visual recording device, as opposed to not wearing such a piece of equipment, was related to low levels of memory conformity, and when image recording condition interacted with memory esteem it resulted in further lowering memory conformity (general and corrective). Therefore, when there were instances of one person conforming to their dyadic partners following the powerful social interaction of discussion, it was in the form of positive and beneficial memory conformity (corrective memory conformity). As in Study 2 (Chapter 3), which investigated dyadic recognition for events of 9/11 under the condition of discussion, there were overall more positive outcomes for shared reminiscence and memory distortion, with more accurate than inaccurate recognition, and
more corrective than distortive memory conformity. In regards to the measurement of memory esteem, we found a Cronbach’s $\alpha$ inter-item reliability similar to that of Study 2, of .79 for all 14 items.

It appears there are benefits of wearing a visual record keeping apparatus in general for remembering as accurately as possible, every day event details. When people were not wearing a recording device, they were more likely to conform to their dyadic partner as there was no physical record of their memory or how they carried out the tasks, they would therefore be less concerned about how they answered and possibly more likely to adopt their partners memory, particularly if they trust them. The levels of conformity that did actually occur in the device wearing group may be because the participants genuinely are unable to retrieve and recognise a particular item and adopt the memory of their partner who they rust in as a source of memory accuracy (Hirst & Echterhoff, 2012). In this research, there was evidence of reduced general memory conformity, and when there was evidence of conformity, it was corrective memory conformity. Consequently, there are beneficial for memory retrieval when sharing reminiscences with a dyadic partner, particularly a dyadic partner in which you trust their memory.

**Implications, Limitations, and Future Directions**

This use of image capturing technology could be applied to police questioning line-ups etc., as findings suggest it encourages people to possibly be more honest, and more vigilant as to what they are answering and remembering due to a passive recording device being on their person and with them being aware that it is constantly capturing images. It has implications for how memories can be recorded and retrieved. It could importantly be used as an aid to recognition, by showing people their images it may make people aware of the strengths and weakness of their memory, which many people may be unaware of and this may affect how often they conform to people and make them more reliant on their own recall
of event details. However, it must be noted, that although every effort was made to ensure that we were measuring memory retrieval such as minimal to no interaction with the device during the initial image recording tasks, it could be a possibility that the findings could relate to memory encoding rather than memory retrieval. However, we believe that the questions and recognition prompts in the materials allow the findings to be applied to the memory retrieval process. Future research should add additional measures to reduce the likelihood that this could be an issue. A further limitation of the study may be the possible intrusion factor and uneasiness that it may incur for other people when interacting with someone wearing a digital image recording device, especially if they don’t’ know what it is and the purpose it serves. Further research is needed into the effects of the visual recording on memory conformity, as there is no other empirical research to date which we are aware of, which examines dyadic memory retrieval and its relations to the recording apparatus in this way.

Conclusions

We were interested in the effects of wearing a visual recording device as opposed to not wearing a visual recording device on shared reminiscence, specifically memory conformity. We expected that dyads wearing such a device would be more conscious of their tasks and more aware of remembering these tasks, specifically when it came to retrieving these memories with another person. We found that wearing an image keeping apparatus contributed to lower levels of memory conformity than not wearing an image recording device, possibly due to people knowing that all their actions are being recorded as continuous, still images, which are accessible to other people. Therefore, they may not be inclined to alter their memory in favour of another person as much as if they were not wearing an image capturing mechanism. That being said, there was some evidence of memory conformity when interpersonal trust was high between dyadic members and when
they discussed their memories, which attests to the power of social influences and how it interacts with image recording technology.
Appendix

Table 1

Means and Standard Deviations for Independent and Dependent Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trust</td>
<td>44.75</td>
<td>16.56</td>
</tr>
<tr>
<td>General Memory Conformity</td>
<td>5.03</td>
<td>2.51</td>
</tr>
<tr>
<td>Corrective Conformity</td>
<td>3.75</td>
<td>3.48</td>
</tr>
<tr>
<td>Distortive Conformity</td>
<td>1.22</td>
<td>1.12</td>
</tr>
<tr>
<td>Memory Esteem</td>
<td>32.40</td>
<td>9.07</td>
</tr>
</tbody>
</table>

Note: All variables had 100% response rate with no missing data.

Table 2

Percentage change in memory recognition from section 1 to section 2 (memory conformity)

<table>
<thead>
<tr>
<th>change in recognition memory from section 1 to section 2 of task</th>
<th>% change from inaccurate to accurate recognition (CC)</th>
<th>% no change from inaccurate to accurate recognition (CC)</th>
<th>% change from accurate to inaccurate recognition (DC)</th>
<th>% no change from accurate to inaccurate recognition (DC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>90</td>
<td>10</td>
<td>67.5</td>
<td>32.5</td>
</tr>
</tbody>
</table>

Note: CC = Corrective Conformity, DC = Distortive Conformity
Table 3

Pearson’s r correlations for each study variable

<table>
<thead>
<tr>
<th>Variable</th>
<th>G-C</th>
<th>Trust</th>
<th>C-C</th>
<th>D-C</th>
<th>M-E</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Conformity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trust</td>
<td>.37*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrective Conformity</td>
<td>.86***</td>
<td>.39*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distortive Conformity</td>
<td>.49***</td>
<td>.05</td>
<td>.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memory Esteem</td>
<td>-.26</td>
<td>-.11</td>
<td>-.21*</td>
<td>-.24</td>
<td></td>
</tr>
</tbody>
</table>

Note: ***p < .0005, **p < .005, *p < .05, C-C = Corrective Conformity, D-C = Distortive Conformity, G-C = General Conformity, M-E = Memory Esteem
Table 4

Main differences of image recording condition (No SenseCam vs. SenseCam) and trust condition (High Trust vs. Low Trust) for each dependent variable in the study

<table>
<thead>
<tr>
<th>Variable</th>
<th>Condition</th>
<th>M</th>
<th>SE</th>
<th>F</th>
<th>df</th>
<th>η²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrective Conformity</td>
<td>No SenseCam</td>
<td>5.25</td>
<td>0.36</td>
<td>34.37***</td>
<td>(1,38)</td>
<td>0.47</td>
</tr>
<tr>
<td></td>
<td>SenseCam</td>
<td>2.25</td>
<td>0.36</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High trust</td>
<td>4.90</td>
<td>0.42</td>
<td>12.80***</td>
<td>(1,38)</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>Low Trust</td>
<td>2.60</td>
<td>0.42</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distortive Conformity</td>
<td>No SenseCam</td>
<td>1.55</td>
<td>0.24</td>
<td>3.58</td>
<td>(1,38)</td>
<td>0.09</td>
</tr>
<tr>
<td></td>
<td>SenseCam</td>
<td>0.91</td>
<td>0.24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High Trust</td>
<td>1.31</td>
<td>0.25</td>
<td>0.18</td>
<td>(1,38)</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>Low Trust</td>
<td>1.15</td>
<td>0.25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Conformity</td>
<td>No SenseCam</td>
<td>6.81</td>
<td>0.39</td>
<td>41.59***</td>
<td>(1,38)</td>
<td>0.52</td>
</tr>
<tr>
<td></td>
<td>SenseCam</td>
<td>3.22</td>
<td>0.39</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High Trust</td>
<td>6.23</td>
<td>.49</td>
<td>12.80***</td>
<td>(1,38)</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>Low Trust</td>
<td>3.75</td>
<td>.49</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: There was no difference in significance between results between controlling and not controlling for each variable, therefore; the controlled for results are reported in the table.

***p < .0005. **p < .005. *p < .05.
Table 5

*Paired samples t-test of mean differences between corrective and distortive memory conformity.*

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SE</th>
<th>t</th>
<th>df</th>
<th>CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrective Conformity</td>
<td>3.75</td>
<td>0.35</td>
<td>6.63***</td>
<td>39</td>
<td>1.8-3.3</td>
</tr>
<tr>
<td>Distortive Conformity</td>
<td>1.23</td>
<td>0.17</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note:* ***p < .0005. **p < .005. *p < .05. C-C = Corrective Conformity; D-C = Distortive Conformity

Table 6

*Paired samples t-test of mean differences between accurate individual memory recognition and inaccurate individual memory recognition.*

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SE</th>
<th>t</th>
<th>df</th>
<th>CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accurate Recognition</td>
<td>8.87</td>
<td>0.23</td>
<td>8.15***</td>
<td>39</td>
<td>2.8-4.7</td>
</tr>
<tr>
<td>Inaccurate Recognition</td>
<td>5.10</td>
<td>0.23</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note:* ***p < .0005. **p < .005. *p < .05.

Table 7

Linear regression table (enter method) for predictor variables of general memory conformity

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>t</th>
<th>df</th>
<th>CI</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trust</td>
<td>0.06</td>
<td>0.02</td>
<td>0.37</td>
<td>2.47*</td>
<td>39</td>
<td>.01-.10</td>
<td>0.14</td>
</tr>
<tr>
<td>Image Recording Device</td>
<td>3.60</td>
<td>0.56</td>
<td>0.72</td>
<td>6.45***</td>
<td>39</td>
<td>2.5-4.7</td>
<td>0.52</td>
</tr>
</tbody>
</table>

*Note:* ***p < .0005. **p < .005. *p < .05
Table 8

*Linear regression table (enter method) for predictor variables of corrective memory conformity*

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>t</th>
<th>df</th>
<th>CI</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trust</td>
<td>0.05</td>
<td>0.02</td>
<td>0.39</td>
<td>2.65*</td>
<td>39</td>
<td>-0.09</td>
<td>0.16</td>
</tr>
<tr>
<td>Image Recording Device</td>
<td>3.01</td>
<td>0.51</td>
<td>0.69</td>
<td>5.86***</td>
<td>39</td>
<td>2.5-4.7</td>
<td>0.52</td>
</tr>
<tr>
<td>Memory Esteem</td>
<td>-0.04</td>
<td>0.04</td>
<td>-0.17</td>
<td>1.10*</td>
<td>39</td>
<td>-0.12-0.04</td>
<td>0.03</td>
</tr>
</tbody>
</table>

*Note: ***p < .0005. **p < .005. *p < .05*
Figure 1. Main effect of wearing a visual recording device on general memory conformity.
Figure 2. Main effect of trust condition on general memory conformity.
Figure 3. Significant interaction between trust and wearing a visual recording device on corrective memory conformity.
Chapter 5 (Study 4)

Investigating Memory Esteem and its Influence on Individual Recognition Memory
Abstract

Memory distortion often occurs during recognition memory as a result of the introduction of postevent information, and the outcome for this can be memory conformity and false memory. Memory conformity occurs when one person modifies their memory by adopting the memory of another person, which regularly occurs with everyday memory retrieval. False recognition occurs when individuals report a non-witnessed event or item. Having previously proposed a new concept termed memory esteem and found a relationship between memory esteem and memory distortion in shared recognition memory (Studies 2 and 3), we were interested in whether memory esteem has a relationship with individual recognition memory. We utilised the Deese-Roediger-McDermott paradigm for critical word list recognition to investigate this relationship in the current study. We found that memory esteem negatively predicted corrective and distortive memory conformity, but not false memory. Therefore, there was evidence of the positive outcomes for memory recognition, even with the introduction of misinformation. Overall, there was more evidence of corrective outcomes for memory recognition than distortive outcomes.

Keywords: Memory Esteem, Memory Conformity, False Memory, Individual Recognition Memory
Investigating Memory Esteem and its Influence on Individual Recognition Memory

Reminiscence often results in memory distortion, particularly in the form of memory conformity and false memory. Memory conformity or the social contagion of memory, occurs when one person alters their memory, by adopting the memory of another person, and believes that memory to be their own experience (Roediger, Meade, Bergman, 2001; Wright, Self, & Justice, 2000). False memory occurs when individuals remember non-witnessed items or events or they remember very differently to how they occurred (Loftus, 2003; McDermott & Roediger, 1998). These memory phenomena are influenced by a number of factors and have positive and negative outcomes for memory retrieval, specifically for memory conformity and false memory.

In previous research, it has been suggested that confidence, and also a belief in one's memory, is related to both positive and negative outcomes for shared memory between two individuals, specifically for memory recognition (Wright & Villalba, 2012). In the present research, we refer to positive and negative outcomes for memory conformity in the form of corrective and distortive memory conformity respectively (see Chapter 2). Corrective memory conformity occurs when a person changes their original memory account in favour of another person, and this change leads to accurate event memory; Distortive memory conformity occurs when the opposite occurs and an individual alters their memory and it is consequentially inaccurate. According to Wright and Villalba (2012) the occurrence of memory conformity is dependent on how confident an individual is in their own memory for an event, when it was a new memory. Previous research suggests that confidence is, more likely, comparatively unrelated to the accuracy of an individual and that they are at highly susceptible to memory reconstruction (Leippe, Eisenstadt, Rauch, & Stambuch, 2006; Lindsay, Read, & Sharma, 1998; Neuschatz et al., 2007; Read, Lindsay, & Nicholls, 1998; Shaw, McClure, & Dykstra, 2007). Further, interaction with highly confident individuals has
been found to produce highly confident, but not necessarily more accurate, memory accounts (Loftus & Hoffman, 1989; Penrod & Cutler, 1995).

**Memory Esteem**

In Chapter 3 (Study 2) we proposed a new construct which we termed Memory Esteem and defined it as that which encompasses one’s worthiness in relation to their ability to remember past occurrences. This concept of memory esteem is related to research in memory confidence, subjective memory belief, and memory efficacy. Though, this is a new concept relating to shared memory, the research in these areas are the most closely related, with measures such as the Metamemory in Adulthood Questionnaire (MIA; Dixon, Hultsch, & Hertzog, 1987), Memory Functioning Questionnaire (MFQ; Gilewski, Zelinski, & Schaie, 1990), Memory Self-Efficacy Questionnaire (MSEQ; Berry, West, & Dennehy, 1989) and Multifactorial Memory Questionnaire (MMQ; Troyer & Rich, 2002) which have some similarities to memory esteem, in the types of items measured. Such research using these memory instruments has examined similar effects to memory esteem on memory distortion.

According to Allan, Palli Midjord, Martin and Gabbert (2012) changing one’s memorial response in favour of another person’s may be an evolutionary and adaptive system for individuals to obey and follow social norms, on occasions where an individual question the capability of their memory. Wright, London, and Waechter (2010) determined that the amount of belief a person has in their own memory affects the extent to which they alter it in favour of another individual. That being said, though these questionnaires have some similarity to memory esteem, they were not related directly to our population of interest as they are applicable mainly to brain injury and cognitive decrements, therefore we constructed and utilised our own measure of memory esteem in the previous and current study.

In Chapters 3 and 4 we investigated shared memory between individuals, specifically the relationship between memory esteem and memory conformity and false memory. We
found both positive and negative outcomes for memory distortion as a result of interaction with another individual, and were therefore; interested in these relationships for individual recognition memory and comparing these with dyadic reminiscence. In Chapter 3 (Study 2) we investigated the relationship between memory esteem and memory distortion for meaningful flashbulb memory of 9/11 and found that memory esteem negatively predicted corrective memory conformity, indicating the possible distortive effects of discussing meaningful details regarding 9/11. In Chapter 4 (Study 3) we utilised image recording technology (SenseCam TM) and found that memory esteem positively predicted corrective memory conformity, adding to the research that collaboration can result in positive outcomes for reminiscence for everyday, mundane detail remembering. The previous chapters involved shared memory, hence; in the current study we wanted to investigate the effects of memory esteem on individual memory recognition, in the form of memory conformity and false memory.

**False Memory**

Another outcome of reminiscence is the development of falsehoods in memory; particularly false memory recognition (Gallo, Roberts, & Seamon, 1997; Loftus, 2003; Thorley & Dewhurst, 2009). Stark, Okado, and Loftus (2010) determined that people, under different social influences, often retrieve non-witnessed and false memory accounts. In fact, the powerful nature of suggestive statements and leading questions are factors which recurrently increase memory distortion, predominantly when provided as misinformation (Gallo, 2013; Higham, Luna, & Bloomfield, 2011; Loftus, Miller, & Burns, 1978). Within false memory research, there are two paradigms which are utilized in the formation of false memory: The Misinformation Paradigm (Loftus, 2003), which supplies participant which inaccurate postevent information; and the Deese-Roediger-McDermott Paradigm (DRM) (Deese, 1959; Roediger & McDermott, 1995) which encourages participants to report a non-
presented critical word (e.g. lion) by presenting them with associated words (e.g. jungle, circus, tiger, tamer, roar) in order to enhance false recognition. There is debate whether both paradigms are measuring the same type of false memory, or whether using different paradigms under different conditions are actually eliciting different types of false accounts (Zhu et al., 2013). It is our view that based on the evidence from previous research findings which have utilized both paradigms and have somewhat compared them, that they are measuring different aspects of false memory under varying contexts. In the interest of comparisons and science, the current thesis utilised both paradigms (Chapters 2, 3, and 4-Misinformation Paradigm; Chapter 5-DRM paradigm) to assess the effects of memory esteem on false memory, for remembering an ordinary and also a flashbulb event, and how memory esteem impacts false recognition in the context of dyadic reminiscence. It has clearly been shown that factors such as misinformation, social interactions, and people’s confidence in their own memory affects false memory, but the current research specifically investigates the positive and negative outcomes for individual memory recognition in how critical non-presented words are affected by a person’s own memory esteem.

**The Present Research**

The overall aim of this research was to examine the relationship of *Memory Esteem* with shared and individual memory recognition, specifically for the outcomes of memory conformity and false memory. In Chapters 3 and 4, we investigated the relationship between memory esteem and shared recognition under varying contexts such as discussion of ordinary events whilst utilising image recording technology, along with discussion of flashbulb events of 9/11. Overall, the findings from Chapters 3 and 4 indicated that memory esteem, which we measured, had a significant relationship with shared memory recognition for flashbulb events and for everyday recognition, and importantly the outcome appeared more positive than negative for the outcome of shared memory. Where there were significant instances of
conformity, there was overall more instances of corrective than distortive memory conformity. Having witnessed these outcomes for shared recognition, in the current study (Study 4), we examined the relationship between memory esteem and individual memory recognition and the outcomes for false memory and memory conformity (distortive and/or corrective) using word recognition tests.

We utilized the Deese-Roediger-McDermott paradigm (DRM) (Deese, 1959; Roediger & McDermott, 1995) for the purposes of encouraging participants to falsely report a non-presented and non-studied critical word (e.g. lion), based on presenting a list of associated words (e.g. tamer, roar, circus, tiger, and jungle). The chosen words were based on their backward associated strength (BAS) and forward associative strength (FAS) values from a 55 word list (Roediger, Watson, McDermott, & Gallo, 2001). We were specifically interested in whether the memory esteem would positively or negatively relate to individual memory recognition for words, as it is somewhat reflective of how people memorise lists and items in daily life settings such as in exams in school and college, presentations in work, and running errands for family members and friends. Therefore, we wanted to assess the influence of memory esteem on individual recognition using a different paradigm than the previous studies, such as word lists, which may be reflective of how people memorise details when it comes to areas such as exam revision, work presentations etc. In the current study, it was hypothesised that memory esteem would negatively predict memory conformity for individual word recognition, and memory esteem would negatively predict false recognition of critical words. The relationship between memory esteem and corrective or distortive memory conformity was an open question.
Method

Participants and Design

Ninety undergraduate students from the University of Limerick (65 women, 25 men; $M_{age} = 19.95, SD = 5.09$) participated in this correctional study as part of their research participation element of an Introductory Psychology module.

Materials and Procedure

Participants were given a paper and pencil questionnaire with demographic questions and a presented word list on the first page, followed by 3 separate sections. Firstly, participants were instructed to ‘study’ a presented word list containing 40 words. This was a word recognition task and the word list provided to participants was based on the Deese-Roediger-McDermott paradigm and the 55 word list (Roediger et al., 2001) for critical, non-presented words. The 8 critical words used in the current research (sleep, lion, window, spider, man, king, anger,) were chosen based on them being the critical words with the highest backwards associative strength (BAS) and forward associative strength (FAS) (McCann, 1998). Each of the 8 non-presented critical words had 5 associated words presented in the word list (total 40 words). The function of the DRM is to encourage participants to report a non-studied critical word (e.g. window) based on presenting them with words associated with the critical word (e.g. curtain, sill, ledge, glass, shutter) (See Appendix E for materials).

In Section 1, participants were presented with word list (40) words, which now contained the previously non-studied critical words, along with words associated with the critical word. Participants were instructed to circle the words which they remembered from the first page (old) and put an x though the words which they did not remember being present on the word list on the first page (new).
In Section 2 participants were again provided with a word list (40 words). This time some words were highlighted in bold. These words were the 8 critical words along with 3 other words associated with the critical words, which were also new and none previously studied (bug, hate, cub; 11 words total replaced). Participants were told “Some words are highlighted in bold. These are the answers which the majority of people have chosen in this task on previous occasions”. The purpose of providing this misinformation in the form of bold non-presented words was to assess memory conformity to the provided bold words, as to whether participants altered their reposes from section 1 to section 2, in favour of someone else’s word recognition.

Section 3 was a measure of Memory Esteem, which included 14 items that were each rated privately by all participants. Some example items included, “I sometimes doubt my memory”, “I believe I have a good memory” (1 = strongly disagree, 6 = strongly agree). Twelve items were used for scoring (items 9 and 10 were not intended nor used for scoring; they were purely informational items only). Items were set to the same response scale, however; six items were reverse scored (items 2, 4, 5, 7, 12, & 13), (Cronbach’s α = .78; lower = .78, upper = .79).

Measures

Memory Conformity was measured in two ways: 1) Corrective memory conformity was measured by a participant altering their word recognition selection from their original choice (section 1) to accepting presented bold (non-studied word) provided by the ‘majority’ and the change was correct (section 2) (i.e., a word such as sleep which was initially falsely recognised as new (non-studied), was subsequently recognised as old (studied)). 2) Distortive memory conformity was measured by a participant altering their word recognition selection from their original choice (section 1) to accepting presented bold (non-studied word) provided by the ‘majority’ and the change was incorrect (section 2) (i.e., the word sleep).
Accurate individual recognition was measured by the participants receiving a score of 1 point for correct category recognised (i.e. recognising window as a new (non-studied critical word) and receiving 0 points for incorrect category recognition. General conformity was measured as any change in memory recognition from section 1 to section 2, in favour of a dyadic partner, regardless of whether it was accurate or inaccurate.

False Memory measurement was based on the Deese-Roediger-McDermott (DRM) paradigm (Deese, 1959; Roediger & McDermott, 1995) which encourages participants to falsely recognise a non-presented and non-studied critical word (e.g. window) based on presenting them with words associated with the critical word (e.g. curtain, sill, ledge, glass, and shutter). Participants receive 1 point each time they recognise a word in the correct paradigm: For correctly recognising that word was previously studies in the word list (old) they get 1 point, or vice versa, for recognising that the word was no previously studied (new).

Memory Esteem, a predictor variable, included 14 items that were each rated privately by all participants. Some example items included, “I sometimes doubt my memory”, “I believe I have a good memory” (1 = strongly disagree, 6 = strongly agree). Twelve items were used for scoring (items 9 and 10 were not intended nor used for scoring; they were purely informational items only). Items were set to the same response scale, however; six items were reverse scored (items 2, 4, 5, 7, 12, & 13), (Cronbach’s α = .74; lower = .73, upper = .74). Missing values were coded as 999 in SPSS.

Results

Means and Correlations

Table 1 contains the means and standard deviation for each study variable. Table 2 includes percentage change in recognition memory from section 1 to section 2 of task (memory conformity). Table 3 contains Pearson’s r correlations for each variable of interest in the study.
Main Effects

A paired samples t-test showed that overall, there was significantly higher instances of corrective memory conformity ($M = 4.46, SD = 2.49$) than distortive memory conformity ($M = 2.33, SD = 1.34$), $t (89) = 7.441$, 95% CI $|1.56-2.71|$, $p < .0001$. There was similarly greater correct category recognition for presented words ($M = 32.34, SD = 2.54$) than incorrect category recognition for presented words ($M = 7.65, SD = 2.53$), $t (89) = 45.94$, 95% CI $|23.62-25.76|$, $p < .0001$.

Using the enter method, a significant linear regression model for general memory conformity emerged: $F (1, 88) = 35.588$ $p < .0001$. The model explains 28% of the variance. Memory esteem was a significant predictor of general memory conformity: ($B = -.175, SE B = .029, \beta = -.537, t (89) = 5.97$, 95% CI $|-.23-.12|$). A significant model for corrective memory conformity also emerged: $F (1, 88) = 17.884$ $p < .0001$. The model explains 15.9% of the variance. Memory esteem was a significant predictor of corrective memory conformity: ($B = -.122, SE B = .027, \beta = -.411, t (89) = 4.23$, 95% CI $|-.17-.06|$). A significant model for distortive memory conformity also emerged: $F (1, 88) = 16.923$ $p < .0001$. The model explains 15.2% of the variance. Memory esteem was a significant predictor of distortive memory conformity: ($B = -.059, SE B = .014, \beta = -.402, t (89) = 4.11$, 95% CI $|-.08-.03|$).

Table 4 contains statistical comparisons of mean differences for corrective memory conformity, distortive memory conformity and false memory between Studies 1, 2, 3, and 4.

Discussion

Having found a relationship between memory esteem and shared memory in Studies 2 and 3 (Chapters 3 and 4), for flashbulb 9/11 memories and ordinary everyday interaction, we then proceeded to examine the influence of memory esteem on individual word list recognition in a correlational pencil and paper study (Study 4). It was expected that, as in the
two previous studies, memory esteem would negatively predict memory conformity and false memory. The findings were consistent with the hypothesis, however; memory esteem was not significantly related to false memory. That being said, there were far more significant relationships compared to Studies 1 and 2. Memory esteem negatively predicted general, corrective and distortive memory conformity, therefore; the more esteem one has in their memory the less they conformed to the suggested purposeful misinformation supplied through the DRM in the form of critical non-studied words. Nonetheless, memory conformity was indeed evident, and these findings are similar to the findings which advocate that it is relatively easy to get individuals to conform to a ‘majority’ selection (which we presented highlighted in bold) due to social pressures (Asch, 1951; Cialdini & Goldstein, 2004; Goodwin, Kukucka, & Hawks, 2013; Thorley and Rushton-Woods, 2013).

Some of the influence on people to conform to a recognised word, without any direct verbal influence, could be because of the desire to be part of the social norm in that it has previously been found that individuals want to have the same answers as others, which leads to conformity. This could be particularly relevant with our study as the average age of participants was 19.95, and all were first year undergraduates who had just began on a new life journey and may feel more pressure than most to ‘fit in’ and follow the crowd. Asch’s line study (1956) demonstrated the power of the group with high instances of conformity, even to known inaccurate responses. Further, it has previously been found that younger individuals are more susceptible to the social power of the group (Janis, 1972; Goodwin et al., 2013).

Overall, as with Studies 1 and 2, there was more positive than negative outcomes for memory esteem and individual recognition, in the form of corrective and distortive memory conformity. Therefore, there are benefits for having a measure such as memory esteem available to assess its impact on how often and when individuals conform to the response of
someone else or to a group, even someone who they didn’t talk to or interact with. This is similar to research by Loftus and Green (1980) who were among the first to determine that indirect information transfer or specifically, reading someone’s written account, was a source of postevent information which could lead to instances of memory distortion. Similarly to our research, Betz, Skowronski, and Ostrom (1996) also provided participants with bogus answers supposedly given by other participants (similar to us supplying answers from a ‘majority’ of previous participants), and they too witnessed levels of memory conformity, due to the power of social pressures, even without verbal conversation. In terms of our measurement of memory esteem, our scale is indeed in the early stages of research, though it had a high inter-item reliability with Cronbach’s α of .74 for the 14 items.

**Comparison of Studies 1, 2, 3, and 4**

In Study 1, for details of a Machu Picchu video documentary which was designed to reflect unimportant, mundane reminiscence, both familiarity and trust positively predicted memory conformity for those who had verbally discussed their event details with each other. The moderation effect by reminiscence type occurred for both corrective memory conformity and for distortive memory conformity, which supports research which has found that shared memory results in positive outcomes (Johansson et al., 2005; Meegan & Berg, 2002) and also, the research which advocates negative outcome as a result of collaboration (Memon & Wright, 1999; Wright et al., 2000). Chapter 2 (Study 1) did not involve a measure of memory esteem therefore, cannot be compared with those specific findings from memory esteem and memory distortion from Studies 2, 3, and 4. In Chapter 3 (Study 2) we found that memory esteem negatively predicted corrective memory conformity for discussing the meaningful flashbulb events of 9/11, however; this relationship was not significant for distortive memory conformity or false memory. In Chapter 4 (Study 3), we found that wearing a visual recording device, as opposed to not wearing such a piece of equipment, is related to low
levels of memory conformity, and when image recording condition interacted with memory esteem it resulted in further lowering corrective memory conformity. In Chapter 5 (Study 4) we found that there were even more significant relationships in this study, specifically negative correlations between corrective and distortive conformity, which was based on word association recognition tests (DRM, Deese, 1959; Roediger & McDermott, 1995).

Across all three studies which investigated memory esteem, even though memory conformity at times was low, it was indeed evident. Possibly and more importantly, is that corrective memory conformity was dominant over distortive memory conformity, supporting previous research that there are positive outcomes for memory conformity, depending on the reminiscence context, such as meaningful flashbulb events, or everyday events, or the effect of introducing image capturing technology. Also, there were relatively low instances of false memory which is a positive outcome for recognition accuracy for both shared and individual memory retrieval. That being said, the evidence of memory conformity between individuals as a result of discussion, even without the influence of discussion, cannot be ignored. In the current study, there was evidence of statistically more corrective memory conformity and distortive conformity, than in Chapters 2, 3, and 4. There was no significant relationship between memory esteem and false memory, therefore; this relationship appeared more significant in the studies involving shared memory and which also utilised the Misinformation Paradigm rather than the Deese-Roediger-McDermott paradigm, with Chapter 3 showing the greatest evidence of false memory for flashbulb memory details.

There are a number of possible explanations why memory distortions occur during shared reminiscence and during individual recognition which also has a supplied social presence in the form of the bogus “majority responses”. According to Deutsch and Gerard (1955), the two main motivations for conformity to someone’s memory, are due to formative and informational social influence. Social influence encourages conformity as a result of
pressure to conformity to a group or to peers, and usually involves conforming unknowingly to someone else’s memory (Goodwin et al., 2013). Misinformation conformity may occur when the person is aware that they are changing their memory, but may be doing it for protective reasons or because there are high stakes or the event is of importance (Thorley & Rushton-Woods, 2013). Another possible explanation for such outcomes is memory blending, in that participant’s memory gets blended with a similar event or item and it alters the original event, and blending is particularly enhanced when the person knows the other person to whom they are conforming (Skagerberg & Wright, 2009). Source misattribution is another possible influence on memory distortion, in that people are often unaware whether a memory is their own, is the memory of someone else, or as been provided through another source (Johnson, Hashtroudi, & Lindsay, 1993; Johnson, Raye, Mitchell, & Ankudowich, 2012; Lindsay & Johnson, 1989). Whatever the explanations for contaminated memory outcomes, it has been well established that social power (verbal and non-verbal) between individuals has influential and intrusive effects on memory retrieval (Bodner et al., 2009). Another possible reason why there was more occurrences of each type of conformity and false memory in the current individual recognition study is that there is no context involved in word recognition, whereas there is context when remembering flashbulb event details of 9/11 and also, when remembering details of tasks that were engaged in whilst wearing an image recording device on your person.

**Implications, Limitations, and Future Research**

This research is innovative in a number of ways. There is evidence of important implications for a possible new construct and a seemingly reliable scale with which to measure the construct of memory esteem and its subsequent impact on memory retrieval. The findings of the interaction between wearing an visual recording device and memory esteem appears to reduce conformity, by making people more sensitive and aware of their
recognition memory selections. Memory esteem seems to interact with such a recording
device, resulting in a reduction of memory conformity, and at least when conformity occurs;
it is corrective memory conformity, with positive implications for memory accuracy.

The findings can be applied to many areas of life, as the studies involved everyday
interactions and meaningful flashbulb memories, all of which are important to people in
different ways. The findings may be relevant to the judicial system, for eyewitness testimony
and with image diary technology becoming more readily available, may be possible to use it
for interview, line-ups etc. The findings may also be relevant for counselors, therapists,
teachers, and employers in gaining more understanding of the influence of something like
memory esteem on interpersonal relationships and on group dynamics and social group
effects. There is evidence of good inter-item reliability in measurement of the 14 item scale
and further research could improve the use of this. It may be important to recognise that there
is possibly another construct that affects shared recognition and memory conformity, and
which differs from memory confidence which has gained a lot of focus in the memory
conformity and memory distortion literature. This is indeed only a starting point for the
proposed memory esteem scale and further research is needed to investigate it in different
contexts and under varying conditions. In further research, it would be an idea to have a
measure of esteem in a dyadic partner also, along with a measure of one’s own self esteem.

A possible limitation of the research is that it could be questioned how applicable
word list recognition is to real life, though as suggested, it may be reflective of some areas of
life such as exam studying, presentations, everyday errands etc. Also, in Study 3, the age
group may have been unreflective as all were first year undergraduates who may be more
susceptible to peer influence and social pressure, particularly, having just began college,
which may be a stressful and often lonely chapter in their life, therefore they look towards
peers to fit in and may possibly lead to high levels of memory conformity than with a sample of more diverse ages.

There appeared to be evidence of social influence and pressure from the group majority in the individual study also, but it must also be noted that there could be different memory process involved in critical word recognition than there is in the Misinformation Paradigm, hence; possible reasons for the large effects in the individual recognition study. Another possible limitation is that participants might have become suspicious of what they were being tested on, though if this was the case, we would have expected lower levels of memory conformity.

Conclusions

In sum, the research findings from the presented study (Study 4) adds to the individual recognition memory literature, in the form of measuring memory esteem and testing its influence on positive and negative outcomes for memory distortion. It was found that memory esteem was negatively related to both corrective and distortive memory conformity, adding to both the argument that memory conformity can have both positive and negative outcomes, specifically when using the Deese-Roediger-McDermott paradigm. In comparing this individual recognition memory study with the studies on shared memory, there was more of each type of conformity in the individual recognition study, though all studies showed the impact of influence and power that comes in different forms from the social environment.
Appendix

Table 1

*Means and Standard Deviations for Independent and Dependent Variables*

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory Esteem</td>
<td>32.31</td>
<td>9.12</td>
</tr>
<tr>
<td>Corrective Conformity</td>
<td>4.46</td>
<td>2.49</td>
</tr>
<tr>
<td>Distortive Conformity</td>
<td>2.33</td>
<td>1.34</td>
</tr>
<tr>
<td>General Memory Conformity</td>
<td>6.71</td>
<td>2.96</td>
</tr>
<tr>
<td>False Memory</td>
<td>7.65</td>
<td>2.53</td>
</tr>
<tr>
<td>Correct Category Recognition</td>
<td>32.34</td>
<td>2.54</td>
</tr>
<tr>
<td>Incorrect Category Recognition</td>
<td>7.65</td>
<td>2.53</td>
</tr>
</tbody>
</table>

*Note:* 1.6% missing values for Memory Esteem; all other variables had 100% response rate.

Table 2

*Percentage change in memory recognition from section 1 to section 2 (memory conformity)*

<table>
<thead>
<tr>
<th>change in recognition memory from section 1 to section 2 of task</th>
<th>% change from inaccurate to accurate recognition (CC)</th>
<th>% no change from inaccurate to accurate recognition (CC)</th>
<th>% change from accurate to inaccurate recognition (DC)</th>
<th>% no change from accurate to inaccurate recognition (DC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>93.3</td>
<td>6.7</td>
<td>92.2</td>
<td>7.8</td>
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</table>

*Note:* CC = Corrective Conformity, DC = Distortive Conformity
Table 3

*Pearson’s r correlations for each study variable*

<table>
<thead>
<tr>
<th>Variable</th>
<th>M-E</th>
<th>F-M</th>
<th>C-C</th>
<th>D-C</th>
<th>G-C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory Esteem</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>False Memory</td>
<td>.05</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>C-C</td>
<td>-.41**</td>
<td>.08</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>D-C</td>
<td>-.40**</td>
<td>.11</td>
<td>.48***</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>G-C</td>
<td>-.54**</td>
<td>.05</td>
<td>.88***</td>
<td>.50***</td>
<td>--</td>
</tr>
</tbody>
</table>

*Note:* ***$p < .0005$, **$p < .005$, *$p < .05$, C-C = Corrective Conformity, D-C = Distortive Conformity, G-C = General Conformity, F-M = False Memory, M-E = Memory Esteem*
Table 4

Paired samples t-tests of mean differences between Studies 1, 2, 3, and 4

<table>
<thead>
<tr>
<th>Variable</th>
<th>Condition</th>
<th>M</th>
<th>SE</th>
<th>t</th>
<th>df</th>
<th>CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-C</td>
<td>Study 4</td>
<td>4.70</td>
<td>0.36</td>
<td>2.24*</td>
<td>39</td>
<td>.09-1.81</td>
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<tr>
<td></td>
<td>Study 3</td>
<td>3.75</td>
<td>0.35</td>
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<tr>
<td></td>
<td>Study 4</td>
<td>4.70</td>
<td>0.26</td>
<td>9.58***</td>
<td>89</td>
<td>2.13-3.24</td>
</tr>
<tr>
<td></td>
<td>Study 2</td>
<td>1.78</td>
<td>0.17</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Study 4</td>
<td>4.70</td>
<td>0.26</td>
<td>0.63</td>
<td>89</td>
<td>-.62-1.19</td>
</tr>
<tr>
<td></td>
<td>Study 1</td>
<td>4.18</td>
<td>0.36</td>
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<td></td>
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</tr>
<tr>
<td>D-C</td>
<td>Study 4</td>
<td>2.30</td>
<td>.18</td>
<td>4.12***</td>
<td>39</td>
<td>.55-1.60</td>
</tr>
<tr>
<td></td>
<td>Study 3</td>
<td>1.23</td>
<td>.18</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Study 4</td>
<td>2.30</td>
<td>.14</td>
<td>.978</td>
<td>89</td>
<td>-.22-64</td>
</tr>
<tr>
<td></td>
<td>Study 2</td>
<td>2.12</td>
<td>.16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Study 4</td>
<td>2.30</td>
<td>.14</td>
<td>1.14</td>
<td>89</td>
<td>-.18-67</td>
</tr>
<tr>
<td></td>
<td>Study 1</td>
<td>2.09</td>
<td>.16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F-M</td>
<td>Study 4</td>
<td>7.66</td>
<td>.37</td>
<td>5.61***</td>
<td>39</td>
<td>1.76-3.74</td>
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<tr>
<td></td>
<td>Study 3</td>
<td>5.10</td>
<td>.23</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Study 4</td>
<td>7.66</td>
<td>.27</td>
<td>0.59</td>
<td>89</td>
<td>-.90-50</td>
</tr>
<tr>
<td></td>
<td>Study 2</td>
<td>7.86</td>
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<td>7.66</td>
<td>27</td>
<td>15.30***</td>
<td>89</td>
<td>4.2-5.5</td>
</tr>
</tbody>
</table>

Note: ***p < .0005. **p < .005. *p < .05. C-C = Corrective Conformity; D-C = Distortive Conformity, F-M = False Memory
Chapter 6

General Discussion
Overview of Main Findings

The aim of the current research was to investigate aspects of shared memory that appear to be under researched, specifically the relationship of interpersonal factors such as familiarity, trust, confidence, and memory esteem with subsequent outcomes for memory distortion, specifically in terms of recognition memory. There has been limited research which has examined shared reminiscence via discussion and revision of memories and how dyadic relationships affect memory distortion in the form of memory conformity (both corrective and distortive) and false memory, as examined in Chapter 2. There has been no research which we are aware of to date that has investigated memory conformity and false memory for meaningful flashbulb memory, specifically for event memory for 9/11, therefore; this was the basis for Chapter 3. We also proposed a scale for measuring what we termed Memory Esteem which has not been measured previously and investigated this relationship with memory distortion for the first time in Chapter 3. Also, there has been very limited research to our knowledge which has used image recording technology (e.g. SenseCam TM) to examine ordinary memory function, and none which has applied it to memory conformity research, therefore; this was the basis for Chapter 4. We investigated the interaction between trust and memory conformity, and memory esteem and memory conformity in that study. In Chapter 5, we investigated the relationship between memory esteem and individual recognition memory, and the outcome for conformity and false memory using the Deese-Roediger-McDermott paradigm. In sum, in the current research we attempted to fill the void in the dyadic memory literature by investigating the impact of these interpersonal relationship factors on recognition memory. Below, the main findings from each chapter will be reviewed.

Chapter 2: Familiarity, Trust, Memory Conformity, and False Memory

We separately measured self-reported interpersonal familiarity and trust, and examined the relationship between these constructs and shared memory recognition,
specifically the outcomes for memory conformity (distortive and corrective) and false memory. We were interested in carrying out this research in order to add to the literature relating to how interpersonal relationships affect memory distortion. To date, there has been no research that we are aware of that specifically measured familiarity and trust; rather there has been a tendency to rely on implied elements such as these, when investigating shared recognition. It was envisaged that familiarity and trust would both predict positive (corrective) and negative (distortive) outcomes for memory conformity for recognition of details of a Machu Picchu documentary, based on research which has found evidence of both, though in different contexts (Andersson & Rönnberg, 1997; French, Garry, & Mori, 2008; Hirst & Echterhoff, 2012; Hope, Ost, Gabbert, Healey, & Lenton, 2008; Hollingshead, 1998).

Consistent with the predictions, these constructs possibly related to the extent to which people altered their memory in favour of their partners, similar to studies that have found similar outcomes for everyday events, such as recalling movie details together (French et al., 2008; Hope et al., 2008). It was further expected that reminiscence type (discussion vs. revision) would interact with the relationship constructs and that discussion between partners who know each other would promote greater modification of one another’s memories than non-verbal interaction, due to the power of verbal social influence. The findings supported this expectation, which is similar to previous research which determined the power of communication and conversation in the altering of retrieval of past events, particularly when dyadic partners are familiar and have high trust in each other (Brown, Coman, & Hirst, 2009; Hirst & Echterhoff, 2012; Hirst et al., 2009; Meegan & Berg, 2002). Harris, Barnier, Keil, and Sutton (2014) determined that everyday events were better collaboratively remembered by dyadic partners who reported their intimacy as higher.

Other researchers have also found contrasting results for conformity to written memory accounts from another person (Betz, Skowronska, & Ostrom, 1996; Loftus &
Greene, 1980) which we investigated with our revision condition, though it was insignificant for effects of conformity. When it does occur, this may be due to influences from other group members or dyadic partners which comes from pressure of social norms (Asch; 1951; Goodwin, Kukucha, & Hawks, 2013; Thorley & Rushton-Woods, 2013). We established a moderation effect by reminiscence type which occurred for both corrective memory conformity (positive) and for distortive memory conformity (negative). Therefore, our findings relate to research that advocates that improved memorial accuracy (corrective memory conformity) can be a result of collaboration (Johansson, Andersson, & Rönnberg 2005; Meegan & Berg, 2002; Roediger, Meade, & Bergman, 2001) and to research that suggests that collaboration produces inaccuracies (distortive memory conformity) for memory retrieval (Echterhoff, Hirst, & Hussy, 2005; Gabbert et al., 2003; Wright et al., 2000).

A positive relationship between self-reported interpersonal familiarity and false memory, and self-reported trust and false memory was expected as a result for remembering the details of the documentary, details which may reflect everyday, mundane details which we encounter. The findings indicated that verbally discussing postevent information and details for an ordinary event results in a more significant effect on false memory than non-verbally exchanging information for such an event (Gabbert, Memon, & Allan, 2003; Hirst & Echterhoff, 2012). Both familiarity and trust were positive predictors of the amount of false memory occurrence when retrieving event details with a person you know.

Chapter 3: Interpersonal Relationship Factors, Flashbulb Memory Conformity, and False Memory

In Chapter 3, we continued our investigation into shared memory recognition, though this time by investigating the relationship between memory conformity and flashbulb event memory, particularly for memory of the terrorist attacks of 9/11, which has not been
researched previously, to the best of our knowledge. Having found that discussion between dyadic members was much more influential than non-verbal revision (Chapter 2); we did not feel the need to compare both these social effects again in the follow up studies. We were interested in the occurrence of memory distortion for the events of 9/11, due to previous findings which suggest that memories for public, shocking, and emotional events remain relatively unchanged over time, even if they are not an accurate reflection of the initial event (Kvavilashvili, Mirani, Schlagman, & Kornbrot, 2003; Pezdek, 2003). There is disparity between researchers as others suggest that conversation specifically alters memories for 9/11, even if they are special and people are protective of them (Coman, Manier, & Hirst, 2009; Hirst et al., 2009). Based on those previous findings, it was predicted that there would be relatively low levels of memory conformity (distortive and corrective), due to people being protective of public flashbulb memories, even when remembering them with a person whom they are familiar, but that there would be some evidence of alteration due to conversational pressures (Davidson, Drouin, Kwan, Moscovitch, & Rosenbaum, 2012; Hirst et al., 2009; Pezdek, 2003).

Further, it was of primary interest how self-reported confidence and familiarity would interact in predicting flashbulb memory conformity, because according to research, confidence is not an indicator of accuracy (Luus & Wells, 1994). Self-reported familiarity negatively predicted corrective memory conformity, and had no significant relationship with distortive memory conformity. These findings suggest that people are attached to memories for the events of 9/11 but with familiarity, they are likely to change some of their memories, though the more familiar a person is with a dyadic member, the less beneficial outcomes there are for memory conformity. That being said, there were no significant negative outcomes for familiarity and memory conformity. Confidence in one’s memory was a significant predictor of memory accuracy, and discussion between dyadic members did not
appear to diminish or affect confidence in one’s memories for 9/11, possibly due to the protective nature of public and emotional events. According to findings by Goodwin et al. (2013) participants reflected another person’s confidence level, which indicated a memory confidence conformity relationship. Discussion among highly confident dyads produced highly confident, but not necessarily more accurate responses (Brewer & Day, 2005).

We were further interested in examining the outcomes for false memory, as a result of the relationship between a flashbulb memory event (9/11), interpersonal familiarity, and trust. We examined the extent to which the interpersonal factors of familiarity and trust increased or decreased incidences of memory conformity. For the meaningful flashbulb stimulus, we predicted relatively low occurrences of false memory, even with the inclusion of purposeful postevent information, based on the assumption that individuals are protective of their memories for stressful and emotional public events (Talarico & Rubin, 2007). However, we predicted that some falsehoods would be evident based on the social persuasive powers of conversation between individuals (Hirst et al., 2009). The findings illustrated that, although trust and false memory were positively correlated, familiarity and false memory were not, therefore; trust between pairs of individuals is a different and more powerful construct than familiarity (Echterhoff et al., 2005; Meegan & Berg, 2002). It was determined that trust was a better indicator of instances of false memory. Familiarity may not have significantly predicted an increase in false memory as it may not be as strong an indicator of contamination of memory retrieval between dyadic members, as trust is.

There is a significant body of research which has focused on the relationship of confidence with shared memory and memory distortion. However, to date, there has been no empirical investigation of something which is similar to confidence, and possibly similar to a belief and efficacy in one’s memory, but that also differs from these concepts. We were interested in filling this void. In the current research, we proposed a construct which we
termed Memory Esteem and a scale for the purposes of measuring memory esteem in order to investigate its subsequent influence on shared memory. We examined the relationship between memory esteem and other interpersonal constructs in order to determine how it relates to memory distortion, whilst influencing and being influenced by such interpersonal constructs.

We found that memory esteem negatively predicted memory conformity for flashbulb events of 9/11, in that as one’s memory esteem increased, memory conformity decreased, indicating that people are somewhat attached to these vivid memories and the emotion relating to it may contribute to an increased esteem (Davidson et al., 2012; Pezdek, 2003), but these memories were not as unchangeable and resilient as such previous research as suggested.

Chapter 4: Image Recording Technology, Interpersonal Trust, Memory Esteem, and Memory Conformity

Having witnessed the relationship between interpersonal factors and shared reminiscence in Chapters 2 and 3, it was of interest to further examine these influences, specifically dyadic trust and memory esteem, via an actual objective measure for memory distortion. The research involved comparing memory retrieval following the wearing of a visual image recording device, to not wearing such a device. It was expected that there would be relatively low levels of memory conformity (distortive and corrective) as a result of wearing an image capturing device due to people being possibly more aware and vigilant of changing their original response when they are aware that there is recorded evidence of what they saw and their level of accuracy. Further, trust was manipulated into high and low trust and it was hypothesised that high trust, along with the social powers of conversation, would increase memory conformity, even in those dyads who wore the visual recording apparatus whilst carrying out the memory tasks.
Consistent with the hypotheses, it was determined that when people were not wearing a recording device, they were more likely to conform to their dyadic partner as there was no physical record of their memory or how they carried out the tasks, they would therefore be less concerned about how they answered and possibly more likely to adopt their partners memory, particularly if they trust them. The levels of conformity that did actually occur in the group which wore the image capturing mechanism may be because the participants genuinely were unable to retrieve and recognise a particular item and hence; adopted the memory of their partner who they trusted as a source of memory accuracy (Hirst & Echterhoff, 2012). The findings from using image capturing technology have important implications for reducing memory conformity during shared remembering, and as these devices are becoming more readily available, can be used to tackle the negatively distortive effects of memory conformity, in areas such as the judicial system, counseling, therapy, and work settings.

We also investigated the interaction between memory esteem and use of visual recording technology (e.g. SenseCam TM) and assessed the impact on memory recognition for a task reflective of one which could be experienced in everyday life, and the consequential outcomes for memory distortion. As predicted, it was determined that memory esteem negatively predicted corrective memory conformity, and along with interacting with visual recording technology, it was found that there were resultant lower levels of conformity to another person memory.

Chapter 5: Memory Esteem, False memory, and Memory Conformity in Individual Recognition Memory

Having studied the relationship between memory esteem and shared recognition memory in Chapters 3 and 4 for flashbulb memory of 9/11 and mundane detail remembering, respectively, we were then interested in the relationship of memory esteem on individual
recognition memory in Chapter 5 (Study 4). This was a correlational study examining individual memory recognition and the relationship of memory esteem on accuracy, false memory, and memory conformity using the Deese-Roediger-McDermott (DRM) paradigm (Deese, 1959; Roediger & McDermott, 1995) for presenting words associated with critical non-studied words. Findings indicated that as in Studies 2 and 3, the higher ones memory esteem, the less they conformed to the memory of another person, in this case the bogus answers of the “majority” which was supplied to participants. There was an indication of more significant relationships in Study 4, than in Studies 2 and 3, with memory esteem negatively predicting each type of memory conformity (general, corrective, and distortive). Moreover, similar to the preceding two studies, there were higher instances of accurate recognition than inaccurate recognition, therefore; supporting the possibility of positive outcomes for conformity to the memory of someone else.

In relation to the proposed scale for memory esteem, the research is indeed in the early stages of development, though we found consistently high inter-item reliability for the 14 items of the scale throughout all three studies which investigated memory esteem (studies 2, 3, and 4) with an average Cronbach’s α inter-item reliability of .76. Overall, throughout the memory esteem studies, there was evidence of both positive and negative (corrective and distortive) outcomes for memory conformity, however; there were higher instances of corrective memory conformity than distortive, and also relatively low occurrences of false memory overall. Study 4 showed evidence of the largest incidence of corrective and distortive memory conformity, in comparison to Studies 1, 2, and 3 but not significantly more false memory. Study 2 had the most evidence of false memory for recognition of details and the sequences of events for 9/11 terrorist attacks.
Summary

In sum, throughout the current research presented over four empirical chapters, we examined the relationship between interpersonal factors and reminiscence and found that although there was evidence of false memory, and both distortive and corrective memory conformity, overall there were more frequent positive than negative outcomes for memory recognition. We also established findings for measuring and investigating the influence of a construct which we labeled memory esteem and found that it was negatively related to memory conformity for both shared and individual recognition. These findings were evident under varying reminiscence contexts such as verbal (discussion) versus non-verbal interaction (revision), and meaningful (flashbulb memory) versus ordinary everyday remembering, along with utilisation of image recording technology for exploring normal memory functioning between dyadic members.

Why Does Memory Distortion Occur?

Previous research has established that a diverse range of situational, social, and cognitive elements affect conformity to another person or group of people, such as group cohesiveness (Back, 1951), status in group (Berkowitz & Macaulay, 1961), group size (Asch, 1956; Wilder, 1977), unanimity (Asch, 1956), judgment difficulty (Deutsch & Gerard, 1955), and transactive memory systems (Wegner, Erber, & Raymond, 1991). I will now review, in further detail, some of the influences that promote memory distortion, and which are possible explanations for the results evident in the previous chapters of this thesis.

Normative and Social Informational Influence Explanation

According to preceding research, there are two main paths to memory conformity between individuals (Baron, Vandello, & Brunsman, 1996; Wright, London, & Waechter, 2010). Deutsch and Gerard (1955) differentiated normative and informational social influence as two ways which can account for conforming to another person’s memory for an
item or event. Informational influence transpires when an individual accepts postevent information, as a result of doubt with regards to whether it is correct or not (Goodwin et al., 2013). Normative influence occurs when an individual knows that presented postevent information is inaccurate but accepts it anyway as they want to evade being contradictory with the source of the information, for example, a dyadic partner, or co-witness (Thorley & Rushton-Woods, 2013).

According to Wright and Villalba (2012) individuals exposed to social influential pressure such as disparity between them and others, are subjected to conflicting responses; numerous forces promote resistance to social influence (i.e. belief and confidence in one’s memory, self-trust) while other elements promote acceptance of social pressure and social norms (trust in others, normative and influential social influence). This is similar to the findings of the current research, which determined higher conformity as a result of interpersonal dyadic familiarity and trust, though there was also evidence that this had both positive (corrective) and negative (distortive) outcomes for shared memory.

Similar to our findings also, McCloskey and Zaragoza (1985) reported that witnesses frequently accept and subsequently report misinformation presented to them by someone who is perceived as a trustworthy source, because this encourages uncertainty in a witness’s own memory for an event or item. French et al. (2008) established that individuals may intentionally conform to the memory of another person whom they are acquainted due to social demands and also, so as to decrease their own cognitive workload. These social influences affect accuracy in whether the outcome of conformity is positive or negative. Wright and Schwartz (2010) found that one person influenced how another responded, whether accurate or inaccurate. We witnessed this in our findings when we saw how discussion between individuals who know and trust in each other, reinforces memory conformity outcomes, as opposed to non-verbal social interaction with another person, such
as in a written memory report. Also, these interpersonal social effects of normative and informational influence were evident in our results where there was promotion of false memory using the Misinformation Paradigm (Loftus, 2003). This was possibly due to discussion of incorrect postevent information with another person, and the positive relationship between trust and false memory in particular.

Early research on the effects of social group members influence on each other, has suggested that this can have a strong impact on even decisions about events of significant importance (Janis, 1972; Le Bon, 1960; Sherif, 1935). Various researchers have established the relevance and importance of social influence in accounting for the achievement of the Nazi party in Germany in the 1930s and 40s and various, somewhat similar totalitarianism movements also (Hoffer, 2011; Weightman & Jones, 1983). According to Janis (1972), under certain meaningful circumstances such as crisis-laden political, scientific, and military issues, judgments of substantial importance were particularly likely to encourage the conformity mechanisms, specifically, when people in a group knew each other. Similar findings were evident in the current research with the relationship between of interpersonal elements and conformity for meaningful flashbulb events, specifically that of the 9/11 terrorist attacks. There was evidence of conformity even to these powerful occurrences which unfolded before us on that day (9/11) and which many researchers have previously claimed remain unchanged. Therefore, normative and informational social influences are elements of flashbulb memory recognition also.

The greatest power of normative and social influences were probably evident in this research where there were high levels of conformity to bogus answers from the “majority” of previous participants, which the researcher provided in the form of critical non-presented words based on utilisation of the Deese-Roediger-McDermott Paradigm (DRM) (Deese, 1959; Roediger & McDermott, 1995) for eliciting false recognition of non-studied words.
However, it was also apparent that some people do not conform to another person's recognition of an item, which was evident in our findings in the instances where memory esteem negatively predicted memory conformity. Further, resistance to conformity is also a phenomenon of normative and informational influence in that according to the disrupt-then-reframe technique (DTR) (Davis & Knowles, 1999; Knowles & Linn 2004; Pollock, Smith, Knowles, & Bruce, 1998) a person can disrupt social influence and engage resistance to an influence, by reframing the persuasive request so that the person is than more open to the proposition of another possibility.

Source Misattribution Explanation

As a result of social interactions with another person, individuals can often misattribute the source of their memory for an event (Lindsay, 1990; Pope, 1996; Scimeca, McDonough, & Gallo, 2011). The concept of source misattribution is apparent in Johnson’s source monitoring framework (Johnson, Hashtroudi, & Lindsay, 1993; Johnson, Raye, Mitchell, & Ankudowich, 2012; Lindsay & Johnson, 1989). Johnson et al. (1993) determined that according to the source monitoring framework for explaining source misattribution, individuals do not usually retrieve a memory ‘tag’ that denotes its specific source or the context in which the remembered item or event was attained. Rather, individuals gain access to their memories and subsequently, attribute their recollections to certain sources by engaging with decision making processes executed during reminiscence. This is often the case during dyadic reminiscence and specifically, in eyewitness testimony, when the source monitoring theoretical framework predicts that participants who are open to co-witness information might mistakenly attribute the recognised event as the authentic experienced event, though they may have conformed to their partner.

Source misattribution occurs most often when the source of the initial memory is uncertain or doubtful in the individuals memory, possibly because it has been impaired or
decayed or time, or because there were errors in encoding the original event (Belli, Traugott, Young, & McGonagle, 1999). In such instances, people attribute the source of their partner or co-witness as their own source for the memory. It is probable that this was a process relevant to our findings for one person conforming to their dyadic partner whom they know, as people who are familiar and trust in each other can be particularly susceptible to source misattributions due to reliance and cognitive interdependence on one another’s memories for an event (Echterhoff et al., 2005; Meegan & Berg, 2002). A person’s memory from one source is confused and misattributed to another source, or to another event entirely (Halamish, Goldsmith, & Jacoby, 2012; Hyman & Billings, 1998).

It is often the case with source monitoring errors that two sources and their related memories coexist, but the original memory is made inaccessible following the exposure to a new, more recent, but also similar memory (Johnson et al., 2012; Lindsay, 1990). Postevent information is often remembered as having been part of the initial event experience and as having occurred, when in actuality, it was introduced much later by another person (Johnson et al., 2012). This may have occurred in the current research, for example, when participants believed that they saw the first plane strike the North Tower of the World Trade Centre on the exact day and time of the 9/11 terrorist attacks, when in actuality it wasn’t shown to people until a much later period in time when the media reported on limited footage that they received of images of the first plane striking the tower.

The co-existence hypothesis, which is based on source misattribution, determined that both the original memory information and misinformation are stored in coexistence in an individual’s memory store, which in turn obstructs the retrieval of the original event information via interference, therefore making it less accessible (Ainsworth, 1998; Bekerian & Bowers, 1983). This can occur in important circumstances such as in eyewitness testimony, for example, when a witness falsely identifies a suspect from a line-up as the
The Trace Alteration Explanation

Research on trace alteration explanations for memory distortion, particularly memory conformity and false memory, determines that an individual's initial memory of an event can be modified and altered by consequent postevent information presented to them, in what is known as the fuzzy trace theory (Brainerd & Reyna, 2002). As part of the fuzzy trace theory,
the gist trace (meaning of the event) and the verbatim trace (surface form) are processed simultaneously with accuracy of remembering being dependent on the successful retrieval of both of these elements (Loftus, Miller, & Burns, 1978). This hypothesis has been found to justify a consistent theoretical perspective based on gist formation, though researchers have suggested that it is less related to explaining the effectiveness of gist in producing false memories (Roediger, Watson, McDermott, & Gallo, 2001).

Accurate memory, particularly recognition memory, is characterised by the presence of both the verbatim and the gist trace (Brainerd & Reyna, 2002). Verbatim and gist traces differ primarily in that gist traces are considered to be relatively robust, while verbatim traces are considered to decay rapidly over time and are more vulnerable to postevent intrusion (Wright & Loftus, 1998). However, if only the gist trace is evident, then there is higher vulnerability for false memory occurrence (Brainerd & Reyna, 2002). This trace alteration hypothesis lends further explanations for the occurrences and acceptance of one person’s memory for an event by the other person, particularly by the processing of supplying misinformation, as was the case in the current research, with the use of both paradigms for false memory creation; the Misinformation Paradigm (Loftus, 2003) and the DRM Paradigm (Roediger & McDermott, 1995). According to Loftus (1975), when trace alteration occurs between a pair of individuals, a dyadic partner can influence a person and overwrite their original memory with a new non-witnessed memory in its place, due to memory conformity, as was evident in our findings, with the relationship between interpersonal constructs and memory conformity. However, our findings were overall positive for memory distortion even with the exposure of dyadic members and individuals to misinformation.

**Memory Blend Explanation**

The memory blend theory refers to how an individual’s memory can blend together with postevent information later suggested to them, most likely from another person,
particularly whom they know, which then merges with the memory of that person leading to memory conformity or also, the occurrence of false memory (Loftus, 1977). This is similar to evidence in the current research findings in the form of consequences of shared memory between dyadic partners, such as memory conformity and false memory. In a study by Pohl and Gawlik (1995), it was determined that blended memories are frequent when utilising the Misinformation Paradigm, under the conditions that minimum memory trace strength of the initial memory experience is present. As the current research utilized the Misinformation Paradigm in the majority of the studies, and since blend memories are frequent with this paradigm, memory blend is another explanation for the outcomes of conforming to another person’s account of an experience.

Metcalfe (1990) proposed The Composite Holographic Associative Recall Model (CHARM) as a means of explaining and accounting for occurrences of memory blend during memory retrieval. This model intimates that inaccurate postevent misinformation is blended with the original memory trace. In a series of studies by Loftus (1977), the usefulness and consistency of using the CHARM for explaining memory blending was evident. The findings of this research were that participants did not retrieve either the misinformation or the original memory, but rather a mixed and blended version of the two. For example, participants were presented with an image of a green car, and later received suggestive misinformation that the car was blue, therefore; when participants undertook the recognition task, they reported the car as a blue-green colour, with a blue shift found in the colour judgments (Loftus, 1977). Weinberg, Wadsworth, and Baron (1983) also had similar outcomes supporting the concept of memory blending when they established that participant’s accounts of the colour of a traffic sign could be modified by consequent misleading information.
Discussion between individuals in a dyad could encourage such memory blending because when people verbally interact with another person and reminisce about past experiences; it often results in a blended memory of the two. This could be because the power of conversation encourages people to overwrite part of their initial memory and replace it with the postevent information, leading to a new combined blended memory (Loftus, 2003). This is an indication of why reminiscence type in the current research (discussion vs. revision) proved to be an important factor in how one person adopts the memory of someone they know. Discussion has been found to have more influence on shared recognition when it comes to memory blending as opposed to non-verbal social interaction (McCann & Higgins 1988; Skagerberg & Wright, 2008).

Ways to Reduce Memory Distortion

Weingardt, Toland, and Loftus (1994) established that warning participants about possible incorrect postevent information has been found to reduce misinformation effects and subsequent memory distortion, which occurs as a result of the introduction of misinformation, particularly by another person. Specifically, telling people to only answer what they were sure was accurate, reduced the effects of misinformation (Echterhoff et al., 2005). Prior research has determined that giving such instructions in particular, lowered the instances of memory conformity (Meade & Roediger, 2002), though it was unknown which element of the instruction was responsible for reducing the effect (Wright, Gabbert, Memon, & London, 2008). Bodner, Musch, and Azad (2009) found increased memorial accuracy as a result of participants receiving specifically instructed details not to report recognised items that were not from the primary source, but rather were from a secondary source of information. It was revealed that these source warnings significantly reduced the amount of conformity between two individuals, and further, that familiar dyads were not more susceptible to reporting non-witnessed events that an impromptu pair (Bodner et al., 2009). Research has supported that
source judgments can not only diminish, but can often eradicate the negative influences of misinformation (Chambers & Zaragoza, 2001; Lindsay & Johnson, 1989). Similarly, monitoring of sources of information by individuals can limit inaccurate recognition, particularly when they encourage participants to be conservative in their memory reports (Zaragoza & Koshminder, 1989). It has been found that such source monitoring and source judgments allow participants to avoid the social pressures which enhance distortion, such as informational and normative pressures, specifically between individuals in a pair (Echterhoff et al., 2005).

The cognitive interview is another means which has been found to reduce the effects of misinformation and resulting memory distortion (Fisher & Geiselman, 1992; Memon, Meissner, & Fraser, 2010; Wagstaff, 2010). The objective of the cognitive interview is to encourage people to give a comprehensive report of everything they remember, with the reasoning that though it has a lenient response criterion, which somewhat foregoes specificity, it has high response sensitivity and low conformity (Fisher, & Geiselman, 2010; Memon & Higham, 1999). Utilising the cognitive interview has been found to increase the amount of correct information reported, but in addition, enhance the number of memorial errors (Roberts & Higham, 2002). Wright et al. (2008) examined the effects of strict and lenient response criteria for the cognitive interview, and determined that a strict procedure led to fewer reports of the errors of a dyadic partner, though; there was also lower reporting of accurate, witnessed events. Kohnken, Milne, Memon, and Bull (1999) suggested that based on their findings, the cognitive interview should be focused on further increased specificity. That being said, this does not necessarily mean that individuals using the cognitive interview in real world settings, such as in police interviews, should use a different response criterion, as the interview response is based mainly on free recall (Wright et al., 2008). Further, to shift the effects of the response criterion would mean a complete review and possible change of
the question types used in the cognitive interview (Wright et al., 2008). Though it has been found to be effective, the cognitive interview is very specific to reducing memory distortion in eyewitnesses, and in research regarding law and the judicial process, however; it is not as applicable to everyday social interactions between individuals in a dyadic relationship who know each other, and how these relationship constructs affect how an individual recognises an item or event. From the findings of the current research, image recording technology may be a means in the future to reduce the introduction of misinformation and subsequently reduce memory conformity and false memory, specifically in dyads. This is due to the evidence of reduced memory conformity and false memory between individuals who wore such an image recording device, as opposed to those who did not. However, such findings are based on early stage dyadic research using image recording technology and require further investigation.

**Implications, Limitations, & Future Direction**

These research findings have important implications for shared and individual memory recognition. As mentioned above, visual recording technology (e.g. SenseCam TM) could be utilised in law settings, within the judicial and police system for its effects on possibly reducing memory conformity and making individuals more aware of their recognition choices. It could also be used in relationship settings such as couple and family counseling due to the effect of trust on memory conformity whilst wearing such a recording device. The findings have overall implications for memory conformity in terms of shared and individual recognition as across all four studies, there are more instances of corrective memory conformity than distortive memory conformity overall, and also relatively low instances of false memory, due to the relationship with interpersonal factors.

In relation to a measure for a new construct such as memory esteem, which is specifically related to memory, this could have important implications for further
understanding shared memory processes of retrieval specifically between dyadic members, who know each other. The memory esteem construct is in the early stages of development, but with a consistently high inter-item reliability evident, there appears to be a basis for its further development. Further replication studies are needed in terms of other contexts of reminiscence; to date we have investigated reminiscence related to everyday task recognition, flashbulb memory recognition, and utilisation of and interaction with image capturing technology. Future research could also develop or incorporate a measure of a dyadic partner's memory esteem, and test this relationship and its influence on memory recognition. Indeed, we have begun researching this concept.

There are important implications for closely held and protected meaningful flashbulb memories, as it is clear that though conformity was corrective and though instances were relatively low, it remains that the social power of verbal conversation impacts even particularly meaningful flashbulb memories and can modify them.

No research is without its limitations. One limitation of this study is that our research was based on memory recognition, therefore, these studies may not be applicable or replicated in studies focused on recall memory. Future research could incorporate both recall and recognition memory in order for the findings to be applicable to both. Further, we didn’t address public conformity, because although discussion of memories was involved, each participant selected their own individual response following dyadic discussion. There may be different outcomes for relationships relating to public conformity studies. Whatley, Webster, Smith, and Rhodes (1999) differentiated between the emotions and goals associated with both public and private compliance. They determined that individuals evade or lessen feelings of fear and shame by way of public compliance, and guilt and pity by way of private compliance (Whatley et al., 1999).
It must also be highlighted that the changes in recognised items from section 1 to section 2 in the research booklets could be due to response conformity and not an actual memory change (Schneider & Watkins, 1996). However, we took measures to ensure this was not the case, such as taking notes regarding the discussions that took place between dyadic members and also, having measures of confidence which corresponded with each item. Future research could include further measures to ensure that memory conformity and not response conformity is being tested. One way could be to have a repeat section 2 called section 3 and present the same items again and if there was concurrence with section 2, then it would be more of an indication of a real memory change from the initial recognition. The inclusion of a control group which does not involve discussion or revision could also be incorporated into prospective research.

A further limitation of the study could be that the investigation of memory distortion following interaction with the visual recording device in Chapter 4 could be related to memory encoding, rather than memory retrieval, which was the focus. We tried to eliminate this possibility by having little interaction with the device during the task and with the probing recognition items used, however; it could be a possibility. Research using the recording device in prospective research should take added steps to ensure that the findings are based on retrieval and not on encoding, if this is the target interest as it was in the current thesis. Prospective research needs to further investigate visual recording technology in different contexts and also allow participants to view their images, though that is more related to autobiographical memory research than the current research.

In the 9/11 flashbulb memory study, although we were not directly interested in autobiographical memory and its relationship with memory conformity and false memory, the findings may be related to autobiographical memory as that is the nature of research into flashbulb memory which is an area that has been primarily researched in terms of
remembering personal details surrounding the events of 9/11 (Pasupathi, Stallworth, & Murdoch, 1998). There is a close connection between autobiographical memory and flashbulb memory (Weaver & Krug, 2004), and though we were interested in the sequence of events and not how a person felt etc. when 9/11 occurred, there is a difficulty in separating one from the other. Impending research should take further steps to ensure this is the case by possibly using memory recall along with recognition items and removing any items and questions which could be attributed to autobiographical memory.

It must be noted that the measures of interpersonal familiarity and trust were based on self-reported ratings, therefore; the findings was based on correlational relationships rather than causal relationships. In future studies, manipulation of familiarity and trust would allow for predictions of causation effects on shared memory outcomes. It could also be possible that the order in which participants completed the self-reported measures (at the end of the task) may have had an impact on the outcome for memory recognition, in that conformity to each other may have impacted how much trust and familiarity each individual had in their dyadic partner by the end of the task. According to self-perception theory, such social interactions could allow perceptions of more or less familiarity or trust in a dyadic partner (Bem, 1972). That being said, this was deliberated over upon designing the experiment and it was decided that it would be best suited to have the measures at the end so has not to induce a false sense of interpersonal familiarity or trust, as resultant distortion may have been due to this influence rather than how well the individuals actually knew each other.

There is always the possibility with empirical research that there is compliance for the purposes of pleasing the experimenter, though; we do not think that this was a particular problem in this research as there was little interaction with the experimenter, as dyadic members were focused on their interactions with each other.
It should also be documented that the materials used in the studies included heterogeneous items (see Appendices A-E.), which may have influenced the data. Upon constructing the materials, the objective was to have a variation of recognition items, including some true/false items and some items with greater multiple choice options, with the rationale that it may allow investigation of a broader range of memory conformity to recognition items and not be restrictive to one or the other. That being said, future research could involve homogenous items in order to test if the outcome for memory recognition would be different from the current findings.

Overall, these research findings are a starting point for both normal memory function and use of visual record keeping, particularly for false memory and memory conformity, and also a starting point for the development and measurement of a new construct, in the form of memory esteem.

**Conclusions**

In previous research, there has been extensive investigation of shared memory, particularly memory recognition, however; there has been limited research which has examined interpersonal relationship constructs on such reminiscence. We were particularly interested in the association between dyadic familiarity, trust, confidence, and memory esteem with memory distortion, and the contexts which would lead to positive (corrective), negative (distortive), or both consequences for memory conformity and also, false memory. Throughout the four presented studies (Chapters 2-5) in the current thesis, we investigated the relationship between interpersonal factors and memory retrieval, and determined that although there was evidence of false memory, and both distortive and corrective conformity, overall there were more instances of positive rather than negative outcomes for shared memory. We also proposed a measure for a new construct which we termed memory esteem, and examined the relationship of this construct with shared and individual recognition
memory. We determined that it was negatively related to memory conformity for both shared and individual recognition, specifically corrective memory conformity. These findings were evident under varying reminiscence contexts such as verbal discussion versus non-verbal interaction, and meaningful (flashbulb memory) versus ordinary everyday remembering, along with utilisation of image recording technology for exploring normal memory function between dyadic members. In sum, the research findings attest to both the possible positive and negative outcomes for memory distortion, but overall, there were greater instances of positive (accurate) memory recognition than negative (inaccurate) memory recognition.
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doi:10.3758/BF03193423


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doi: 10.1002/acp.1470


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Appendix A

Please circle or fill in the correct answer where required. Complete all questions in sequence, do not skip questions. DK represents “don’t know” so circle this if you don’t remember. Some items are already done for you (whether correct or incorrect) and these are highlighted in *bold. Please circle if you believe them to be correct. Do not turn the page until this section is complete.

1. Did the guide/narrator in the video wear a hat? (circle): Yes, No, DK
2. What colour bag did the guide carry? (circle): *Black, Brown, Grey, No Bag, DK
4. Machu Picchu was discovered in which year? (circle): 1914, 1911, 1811, 1813, DK
5. In which mountain range does Machu Picchu lie? (fill in answer):
6. In which country is Machu Picchu in? (circle): Argentina, Peru, Ecuador, DK
7. Were there donkeys covered in multi-coloured cloth? (circle): *Yes, No, DK
8. Name all the animals you saw in the video:
9. Who first revealed Machu Picchu to the world? *Bingham
10. Which People built Machu Picchu? (circle): Spaniards, Aztecs, Incas, DK
11. What is the name of the city that is below Machu Picchu?
12. The people of Machu Picchu were weavers. (circle): True, False, DK
13. Machu Picchu was first destroyed by Civil War. (circle): True, False, DK
14. The walls of the city below Machu Picchu were built how many years ago? (circle):
   600, 500, 1000, 300, DK
15. Which musical instruments were evident in the video (circle as many as you remember): *Accordion, Guitar, Flute, *Drums
INSTRUCTIONS FOR PARTICIPANTS: Undertake this task in a pair (dyad), with someone who you are familiar with (e.g. friend, family member, class mate, partner). The other member of your dyad will not see any of your responses, it is confidential. EXTREMELY IMPORTANT. The researcher is trusting that you will be honest in your answers.

IMPORTANT *Please fill out these below questions without consultation with your dyadic partner.

It is irrelevant who is participant A or B, you can assign yourselves. Please answer all questions in sequence. Do not skip sections and come back. PLEASE DO NOT turn any pages until you are instructed to do so.

Now, please begin answering the questions below. Please write in block capitals.

Participant A or B? 

Your Name: __________________________

Gender: Male □ Female □

Age: ______

Marital Status: (Please circle one)

Single Married Divorced Cohabiting In a relationship Remarried Widowed

What is the name of your Partner in the task? __________________________

***Only when this is completed please turn over the page***.
SECTION 1. IMPORTANT: Please respond to each item below independently, silently—no discussion with your partner. All responses to this section fit onto this page. VERY IMPORTANT: This is a memory task, so please do not consult the internet or any other sources for your answers. Do not consult with your partner. Please answer the following questions by placing a circle on an answer. Some answers are highlighted in bold; circle these if you believe they are correct.

1. Where were you on the day of the 9/11 (September 11th, 2001) attacks on the world trade centre in Manhattan, New York City? Please indicate here: _______________________________________

2. How clear is the memory of the attacks for you? Please circle one number below.

<table>
<thead>
<tr>
<th>I don’t remember it at all</th>
<th>A little clear</th>
<th>Moderately clear</th>
<th>Very clear</th>
<th>I remember it very clearly</th>
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<tr>
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</tbody>
</table>

Please tick the response that you remember to be correct; one response for each item below.

Please rate how confident you are about each response to the left.

<table>
<thead>
<tr>
<th>3. Which world trade centre tower was hit first?</th>
</tr>
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<tbody>
<tr>
<td>□ North Tower □ South Tower</td>
</tr>
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</table>

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<tr>
<th>4. How many of the people who died were firemen?</th>
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<tr>
<td>□ 1 in 8 □ 1 in 9 □ 1 in 11</td>
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<table>
<thead>
<tr>
<th>5. All hijacked planes took off from Boston?</th>
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</thead>
<tbody>
<tr>
<td>□ True □ False</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>6. Where was the airplane which crashed down destined for originally before being hijacked?</th>
</tr>
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<tbody>
<tr>
<td>□ San Francisco □ Atlanta □ Washington</td>
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</table>

<table>
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<tr>
<th>7. Flight United 93 did not hit their target?</th>
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<tbody>
<tr>
<td>□ True □ False</td>
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</tbody>
</table>

<table>
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<tr>
<th>8. All flights were United Airlines?</th>
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<tbody>
<tr>
<td>□ True □ False</td>
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<table>
<thead>
<tr>
<th>9. How many firemen in total died in 9/11?</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ 292 □ 363 □ 410</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>10. Flight 175 was the first plane to be hijacked and hit the world trade centre first?</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ True □ False</td>
</tr>
<tr>
<td>Question</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>11. One plane crashed down in?</td>
</tr>
<tr>
<td>□ Pennsylvania □ Virginia □ Indiana</td>
</tr>
<tr>
<td>12. Flight 11 hit the north tower?</td>
</tr>
<tr>
<td>□ True □ False</td>
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<tr>
<td>13. Flight 175 hit the north tower?</td>
</tr>
<tr>
<td>□ True □ False</td>
</tr>
<tr>
<td>14. How many people in total died in the 9/11 attacks?</td>
</tr>
<tr>
<td>□ 3215 □ 3497 □ 3775</td>
</tr>
<tr>
<td>15. Flight 77 did not hit the pentagon?</td>
</tr>
<tr>
<td>□ True □ False</td>
</tr>
<tr>
<td>16. Which tower collapsed first?</td>
</tr>
<tr>
<td>□ North Tower □ South Tower</td>
</tr>
<tr>
<td>17. I saw both towers collapse, one after another on September 11th, 2001.</td>
</tr>
<tr>
<td>□ True □ False</td>
</tr>
<tr>
<td>18. The president, George Bush was reading a book to elementary school children when the attacks happened.</td>
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<tr>
<td>□ True □ False</td>
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</table>

***Please go on to the next page to section 2 only when section 1 above is completed ***

Do not go back to section 1.
SECTION 2. EXTREMELY IMPORTANT: Next, before you select an answer below, please discuss each question and answer with your partner. Feel free to respond differently than you did in Section 1 if you now remember differently. Do not go back and change any response in Section 1.

VERY IMPORTANT: Again, this is a memory task: Do not consult the internet or other sources.

Some answers are in bold; circle these if you believe they are correct.

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<tr>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
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</tbody>
</table>

Please tick the response that you remember to be correct; one response for each item below

3. Which world trade centre tower was hit first?
   □ North Tower  □ South Tower

4. How many of the people who died were firemen?
   □ 1 in 8  □ 1 in 9  □ 1 in 11

5. All hijacked planes took off from Boston?
   □ True  □ False

6. Where was the airplane which crashed down destined for originally before being hijacked?
   □ San Francisco □ Atlanta □ Washington?

7. Flight United 93 did not hit their target?
   □ True  □ False

8. All flights were United Airlines?
   □ True  □ False

9. How many firemen in total died in 9/11?
   □ 292  □ 363  □ 410

10. Flight 175 was the first plane to be hijacked and hit the world trade centre first?
    □ True  □ False

11. One plane crashed down in?
    □ Pennsylvania □ Virginia □ Indiana
<table>
<thead>
<tr>
<th></th>
<th></th>
<th>confirmed</th>
</tr>
</thead>
<tbody>
<tr>
<td>12. Flight 11 hit the north tower?</td>
<td>□ True □ False</td>
<td>Not confirmed ①②③④⑤ Very confident</td>
</tr>
<tr>
<td>13. Flight 175 hit the north tower?</td>
<td>□ True □ False</td>
<td>Not confirmed ①②③④⑤ Very confident</td>
</tr>
<tr>
<td>14. How many people in total died in the 9/11 attacks?</td>
<td>□ 3215 □ 3497 □ 3775</td>
<td>Not confirmed ①②③④⑤ Very confident</td>
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<tr>
<td>15. Flight 77 did not hit the pentagon?</td>
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</tr>
<tr>
<td>17. I saw both towers collapse, one after another on September 11th, 2001.</td>
<td>□ True □ False</td>
<td>Not confirmed ①②③④⑤ Very confident</td>
</tr>
<tr>
<td>18. The president, George Bush was reading a book to elementary school children when the attacks happened.</td>
<td>□ True □ False</td>
<td>Not confirmed ①②③④⑤ Very confident</td>
</tr>
</tbody>
</table>

***Only when this is completed please turn over the page***
SECTION 3: Do not discuss this section with the other participant. Please place a √ (tick) in the space provided which best explains your relationship with participant A/B (pA). Answers will NOT be known to pA/B. **One √ (tick) only per question**

1. How familiar are you with pA/B?
   __ Not at all familiar
   __ Somewhat familiar
   __ Familiar
   __ Fairly familiar
   __ Very familiar
   __ Extremely familiar

2. How long have you known pA/B?
   __ I don’t know him/her
   __ Less than a week
   __ Less than 5 months
   __ Less than a year
   __ Less than 5 years
   __ More than 5 years

3. How much time per week do you spend with pA/B?
   __ 0 to 10 hours
   __ 11 to 20 hours
   __ 21 to 30 hours
   __ More than 30 hours

4. Do you know the names of all the siblings of pA/B? (Please tick one)
   __ YES  __ NO

5. Do you know any past history of pA/B?
   __ None at all
   __ Some
   __ A fair bit
   __ A lot
   __ Everything

6. Do you know pA’s/B’s favourite colour? (Please tick one)
   __ YES  __ NO

7. If you wanted to take pA/B out to eat, would you know where to take them?
   __ I have no idea
   __ I’d have to think about it
   __ I think I know
   __ I would definitely know

8. Do you know both pA’s/B’s parents’ names?
   __ YES  __ NO

9. How would you describe your relationship with pA/B?
   __ I don’t know him/her
   __ Acquaintance
   __ Friend
   __ Close Friend
   __ Partner

10. How would you categorise your relationship with pA/B?
    __ Stranger
    __ Acquaintance
    __ Friend
    __ Girl/Boyfriend
    __ Husband/Wife
    __ Sibling
    __ Parent
    __ Son/Daughter
    __ Relative
    __ Other________
SECTION 4: For each item, using the scale below, please make a √ (tick mark) in the space which corresponds to how much or little you agree with each of the following statements. Provide only one response for each statement. Your responses will NOT be known to pA.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

1. I would go hiking with Participant A/B (pA/B) in unfamiliar territory if pA/B assured me he/she knew the area.

2. I could rely on pA/B to mail an important letter for me if I couldn't get to the post office.

3. pA/B would never intentionally misrepresent my point of view to others.

4. If pA/B knew what kinds of things hurt my feelings, I would never worry that he/she would use them against me, even if our relationship changed.

5. If my alarm clock was broken and I asked pA/B to call me at a certain time, I could count on receiving the call.

6. If I told pA/B what things I worry about, he/she would not think my concerns were silly.

7. If pA/B were going to give me a ride somewhere and didn't arrive on time, I would guess there was a good reason for the delay.

8. If we decided to meet somewhere for lunch, I would be certain he/she would be there.

9. If I were injured or hurt, I could depend on pA/B to do what was best for me.

10. I would be able to confide in pA/B and know that he/she would not discuss my concerns with others.

11. I could expect pA/B to tell me the truth.
**Psychology REC ID: FYP 11-031**  
**DYAD: GROUP**  
**SECTION 5:** For each item, using the scale below, please make a √ (tick mark) in the space which corresponds to how much or little you agree with each of the following statements. Provide only one response for each statement.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Slightly agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

1. I rely on my memory to be correct.  
2. I sometimes doubt my memory.  
3. I believe I have a good memory.  
4. I often doubt my memory.  
5. I sometimes question the accuracy of my memories.  
6. I am confident in my memory.  
7. I believe in the possibility of false memory occurrence.  
8. I rely on my childhood memories.  
9. I rely on my short term memory more than my long term memory.  
10. I rely on my long term memory more than my short term memory.  
11. I believe my memory is always correct.  
12. Sometimes my memory may be inaccurate.  
13. Memory is reconstructive.  
14. My memory is a true reflection of past events.

Please tick one of the following boxes with regards to how you feel about the other person (it is confidential)

- I trust him/her  
- I do not trust him/her

Please tick one of the following boxes with regards to how you feel about the other person (it is confidential)

- I am familiar with him/her  
- I am unfamiliar with him/her
Appendix C.

Psychology REC ID: FYP 11-031

Instructions for participants: Wearing the SenseCam TM, go to the foundation building (where the concert hall is located). Go to the main entrance which is from the plaza and is at ground level (FG). Follow the directions below to the various items. Stop at each item for maximum 20 seconds and take a mental note of it. NB: Do not write anything down or use your phone or any electronic device for the duration of the task please. Stand as still as possible. Follow the task in sequence. Do not go back to any task. Move onto the next. If you meet another participant with a SenseCam please do not speak to them. The SenseCam is recording at all times. At each task please press the manual shutter button on the camera. If you need to use the bathroom you can operate the privacy button (as demonstrated). Please begin the tasks. Thank you.

Item 1 – Walk into the foundation building through the main entrance on the ground floor (FG). Directly inside the door in front of you is the board of directors plaque. Take a mental note of the first four surnames on the right hand side.

Item 2- From the main entrance (FG) walk to your left and past the ladies toilets there is a plaque of a list of benefactors. Take a mental note of this.

Item 3- From the main entrance (FG) walk to your right, there is a large painting/artwork made of mosaic tiles along the entire wall. Take a mental note of this.

Item 4- Go down to the basement level (FB) in the lift. When you exit the lift behind you there is a large painting called “The Planning Board”. Take a mental note of this.

Item 5-Go down to the basement level (FB) in the lift. When you exit the lift to your left there is a painting of a man in robes on his own. Take a mental note of this.

REMINDER-PLEASE DO NOT WRITE ANYTHING DOWN AT ANY TIME.
**Item 6**-Go to floor 1 (F1). To do this you must walk up the stairwell which is nearest the plaza (main entrance). Go in through the archway to the collection called “Watercolour Society of Ireland”. Along the wall there is a piece of artwork which contains a number of handwritten addressed letters. Take a mental note of this.

**Item 7**-Go the top floor (F2). At the top of the stairs go into the archway to the area called “National Self Portrait Collection”. There are a number of pieces of artwork on the floor (not on the wall). Take a mental note of the surnames of the first three pieces when you enter the collection area.

**Item 8**-Also on this floor (F2) and in the same collection but on the wall there is a piece of artwork by Liam Belton called “Mixed Media”. Take a mental note of this.

**Item 9**-Also on this floor (F2) and in this collection there is reference to a chocolate/candy bar in one of the art pieces. Take a mental note of this.

**Item 10**-Stay on the top floor (F2). Go the last set of double doors which leads to the large bridge which joins across to the main building. At the entrance to these double doors there are a number of paintings. From the doors and moving left, take a mental note of the first four surnames of the artists.
Appendix D

Psychology REC ID: FYP 11-031

Dyad (Pair): , Group

INSTRUCTIONS FOR PARTICIPANTS: Undertake this task in a pair (dyad). The other member of your pair will not see any of your responses, it is confidential.

IMPORTANT *Please fill out these below questions without consultation with your dyadic partner. It is irrelevant who is participant A or B, you can assign yourselves. Please answer all questions in sequence. Do not skip sections and come back. PLEASE DO NOT turn any pages until you are instructed to do so.

Now, please begin answering the questions below. Please write in block capitals.

Participant A or B?  

Your Name: ____________________________

Gender: Male  Female

Age: ________

Marital Status: (Please circle one)

Single  Married  Divorced  Cohabiting  In a relationship  Remarried  Widowed

What is the name of your Partner in the task? ____________________________

***Only when this is completed please turn over the page***.
SECTION 1. IMPORTANT: Please respond to each item below independently, silently — no discussion with your partner. All responses to this section fit onto this page. VERY IMPORTANT: This is a memory task, so please not consult the internet or any other sources for your answers. Do not consult with your partner. Please answer the following questions by placing a circle on an answer. Some answers are highlighted in bold; circle these if you believe they are correct.

- How clear is the memory of the tasks which you undertook? Please circle one number below.

<table>
<thead>
<tr>
<th>I don’t remember it at all</th>
<th>A little clear</th>
<th>Moderately clear</th>
<th>Very clear</th>
<th>I remember it very clearly</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
</tr>
</tbody>
</table>

Please tick the response that you remember to be correct; one response for each item below

<table>
<thead>
<tr>
<th>Question</th>
<th>Response Options</th>
<th>Confident Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How many male angels are in the large mosaic painting on the ground floor, on the right hand wall?</td>
<td>□ Four □ Five □ Six</td>
<td>Not confident 1 2 3 4 5 Very confident</td>
</tr>
<tr>
<td>2. The writing on the painting by Thomas Ryan in the Basement (man in robes on his own) is written in which language?</td>
<td>□ Irish □ Latin</td>
<td>Not confident 1 2 3 4 5 Very confident</td>
</tr>
<tr>
<td>3. The quote on the large mosaic painting on the ground floor is “His soul roots in the tree of light”.</td>
<td>□ True □ False</td>
<td>Not confident 1 2 3 4 5 Very confident</td>
</tr>
<tr>
<td>4. In the painting “The Planning Board, there are how many men?</td>
<td>□ Five □ Six □ Seven?</td>
<td>Not confident 1 2 3 4 5 Very confident</td>
</tr>
<tr>
<td>5. In the painting “The Planning Board, there are 3 people wearing eye glasses?</td>
<td>□ True □ False</td>
<td>Not confident 1 2 3 4 5 Very confident</td>
</tr>
<tr>
<td>6. On the Plaque with the list of benefactors (left hand wall, ground floor), one such company is Opel Ireland?</td>
<td>□ True □ False</td>
<td>Not confident 1 2 3 4 5 Very confident</td>
</tr>
<tr>
<td>7. On the 2nd floor, in the collection called “The Watercolour Society of Ireland”, there is a painting with written letter. The Irish county referred to in it is?</td>
<td>□ Louth □ Longford □ Leitrim</td>
<td>Not confident 1 2 3 4 5 Very confident</td>
</tr>
<tr>
<td>8. Which of the following surnames were not contained in the first floor surnames on the left hand side of the board of directors inside the main entrance?</td>
<td>□ Mitchell □ Maher □ Morrison</td>
<td>Not confident 1 2 3 4 5 Very confident</td>
</tr>
<tr>
<td>9. The Board of directors straight inside the main door contains directors from which of the following years?</td>
<td>□ 1983-1999 □ 1981-1993 □ 1989-1993</td>
<td>Not confident 1 2 3 4 5 Very confident</td>
</tr>
<tr>
<td>10. There was an artistic piece of a red “Dime” Chocolate bar on the wall in the National Self portrait collection.</td>
<td>□ True □ False</td>
<td>Not confident 1 2 3 4 5 Very confident</td>
</tr>
<tr>
<td>11. When put together the initials of the artists“ surnames of the first three pieces on the floor in the National Self Portrait Collection were O.M.O?</td>
<td>□ True □ False</td>
<td>Not confident 1 2 3 4 5 Very confident</td>
</tr>
<tr>
<td>12. Which of the following items were present in the “Mixed</td>
<td>Not confident 1 2 3 4 5 Very confident</td>
<td></td>
</tr>
<tr>
<td>Question</td>
<td>Confidence</td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>------------</td>
<td></td>
</tr>
<tr>
<td>Media&quot; piece in the Self-portrait Collection? Only tick one</td>
<td>Very confident</td>
<td></td>
</tr>
<tr>
<td>□ Fork □ five pound note □ pencil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. What were the surnames of the first four artists to the left</td>
<td>Not confident 1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>from the double doors leading to the bridge on the second floor?</td>
<td>Very confident</td>
<td></td>
</tr>
<tr>
<td>14. In the large mosaic painting on the right hand wall on the</td>
<td>Not confident 1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>ground floor, what colour were the angel’s wings?</td>
<td>Very confident</td>
<td></td>
</tr>
<tr>
<td>□ Gold □ Silver</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. In “The Planning Board” painting, there were 3 women.</td>
<td>Not confident 1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>□ True □ False</td>
<td>Very confident</td>
<td></td>
</tr>
</tbody>
</table>

***Please go on to the next page to section 2 only when section 1 above is completed ***

Do not go back to section 1.
SECTION 2. EXTREMELY IMPORTANT: Next, before you select an answer below, please discuss each question and answer with your partner. Feel free to respond differently than you did in Section 1 if you now remember differently. Please do not go back and change any response in Section 1. Some answers are in bold; circle these if you believe they are correct.

- How clear is the memory of the tasks which you undertook? Please circle one number below.

<table>
<thead>
<tr>
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<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Please tick the response that you remember to be correct; one response for each item below. Please rate how confident you are about each response to the left.

1. How many male angels are in the large mosaic painting on the ground floor, on the right hand wall?
   - Four
   - Five
   - Six
   Not confident 1 2 3 4 5
   Very confident

2. The writing on the painting by Thomas Ryan in the Basement (man in robes on his own) is written in which language?
   - Irish
   - Latin
   Not confident 1 2 3 4 5
   Very confident

3. The quote on the large mosaic painting on the ground floor is “His soul roots in the tree of light”.
   - True
   - False
   Not confident 1 2 3 4 5
   Very confident

4. In the painting “The Planning Board, there are how many men?
   - Five
   - Six
   - Seven
   Not confident 1 2 3 4 5
   Very confident

5. In the painting “The Planning Board, there are 3 people wearing eye glasses?
   - True
   - False
   Not confident 1 2 3 4 5
   Very confident

6. On the Plaque with the list of benefactors (left hand wall, ground floor), one such company is Opel Ireland?
   - True
   - False
   Not confident 1 2 3 4 5
   Very confident

7. On the 2nd floor, in the collection called “The Watercolour Society of Ireland”, there is a painting with written letter. The Irish county referred to in it is?
   - Louth
   - Longford
   - Leitrim
   Not confident 1 2 3 4 5
   Very confident

8. Which of the following surnames were not contained in the first floor surnames on the left hand side of the board of directors inside the main entrance?
   - Mitchell
   - Maher
   - Morrison
   Not confident 1 2 3 4 5
   Very confident

9. The Board of directors straight inside the main door contains directors from which of the following years?
   - 1983-1999
   - 1981-1993
   - 1989-1993
   Not confident 1 2 3 4 5
   Very confident

10. There was an artistic piece of a “Dime” Chocolate bar on the wall in the National Self portrait collection?
    - True
    - False
    Not confident 1 2 3 4 5
    Very confident

11. When put together the initials of the artists’ surnames of the first three pieces on the floor in the National Self Portrait Collection were O.M.O?
    - True
    - False
    Not confident 1 2 3 4 5
    Very confident

12. Which of the following items were present in the “Mixed Media” piece in the Self-portrait Collection? Only tick one
    Not confident 1 2 3 4 5
    Very confident
<table>
<thead>
<tr>
<th>□ Fork □ five pound note □ pencil</th>
<th></th>
</tr>
</thead>
</table>
| 13. What were the surnames of the first four artists to the left from the double doors leading to the bridge on the second floor? | Not confident 1 2 3 4 5  
Very confident |
| 14. In the large mosaic painting on the right hand wall on the ground floor, what colour were the angel’s wings? □ Gold □ Silver | Not confident 1 2 3 4 5  
Very confident |
| 15. In “The Planning Board” painting, there were 3 women. □ True □ False | Not confident 1 2 3 4 5  
Very confident |

***Only when this is completed please turn over the page***.
SECTION 3: Do not discuss this section with the other participant. Please place a √ (tick) in the space provided which best explains your relationship with participant A/B (pA). Answers will NOT be known to pA/B. **One √ (tick) only per question**

1. How familiar are you with pA/B?
   - Not at all familiar
   - Somewhat familiar
   - Familiar
   - Fairly familiar
   - Very familiar
   - Extremely familiar
   ___ YES   ___ NO

2. How long have you known pA/B?
   - I don’t know him/her
   - Less than a week
   - Less than 5 months
   - Less than a year
   - Less than 5 years
   - More than 5 years
   ___ YES   ___ NO

3. How much time per week do you spend with pA/B?
   - 0 to 10 hours
   - 11 to 20 hours
   - 21 to 30 hours
   - More than 30 hours
   ___ YES   ___ NO

4. Do you know the names of all the siblings of pA/B? (Please tick one)
   ___ YES   ___ NO

5. Do you know any past history of pA/B?
   - None at all
   - Some
   - A fair bit
   - A lot
   - Everything
   ___ YES   ___ NO

6. Do you know pA’s/B’s favourite colour? (Please tick one)
   ___ YES   ___ NO

7. If you wanted to take pA/B out to eat, would you know where to take them?
   - I have no idea
   - I’d have to think about it
   - I think I know
   - I would definitely know
   ___ YES   ___ NO

8. Do you know both pA’s/B’s parents’ names?
   ___ YES   ___ NO

9. How would you describe your relationship with pA/B?
   - I don’t know him/her
   - Acquaintance
   - Friend
   - Close Friend
   - Partner
   ___ YES   ___ NO

10. How would you categorise your relationship with pA/B?
    - Stranger
    - Acquaintance
    - Friend
    - Girl/Boyfriend
    - Husband/Wife
    - Sibling
    - Parent
    - Son/Daughter
    - Relative
    - Other ________
**SECTION 4:** For each item, using the scale below, please make a ✓ (tick mark) in the space which corresponds to how much or little you agree with each of the following statements. Provide only one response for each statement. Your responses will NOT be known to pA.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
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<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I would go hiking with Participant A/B (pA/B) in unfamiliar territory if pA/B assured me he/she knew the area.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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<td>8. If we decided to meet somewhere for lunch, I would be certain he/she would be there.</td>
<td></td>
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<td>9. If I were injured or hurt, I could depend on pA/B to do what was best for me.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. I would be able to confide in pA/B and know that he/she would not discuss my concerns with others.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. I could expect pA/B to tell me the truth.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SECTION 5: For each item, using the scale below, please make a ✓ (tick mark) in the space which corresponds to how much or little you agree with each of the following statements. Provide only one response for each statement.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Slightly agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
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</table>

1. I rely on my memory to be correct. 
2. I sometimes doubt my memory. 
3. I believe I have a good memory. 
4. I often doubt my memory. 
5. I sometimes question the accuracy of my memories. 
6. I am confident in my memory. 
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8. I rely on my childhood memories. 
9. I rely on my short term memory more than my long term memory. 
10. I rely on my long term memory more than my short term memory. 
11. I believe my memory is always correct. 
12. Sometimes my memory may be inaccurate. 
13. Memory is reconstructive. 
14. My memory is a true reflection of past events.

Please tick one of the following boxes with regards to how you feel about the other person (it is confidential)

I trust him/her ✓
I do not trust him/her □

Please tick one of the following boxes with regards to how you feel about the other person (it is confidential)

I like him/her ✓
I do not like him/her □

Please tick one of the following boxes with regards to how you feel about the other person (it is confidential)

I am familiar with him/her ✓
I am unfamiliar with him/her □

Thank you for your participation!
Appendix E

Psychology REC ID: FYP 11-031

INSTRUCTIONS FOR PARTICIPANTS: ****NB****. Do not turn the page until you come to the end of the page and are instructed to do so.

Please fill in your details below.

Please study the word list below (for 3 minutes max).

Gender: Male  Female  

Age:  

Marital Status:(Please circle one)

Single  Married  Divorced  Cohabiting  In a relationship  Remarried  Widowed

Nap  Scent  Sill  Curtain  Web  Queen  Husband  Rage  Fury
Tiger  Doze  Whiff  Aroma  Shutter  Tarantula  Throne  Handsome
Hatred  Roar  Temper  Monarch  Awake  Glass  Bed  Stench  Ledge
Reek  Arachnid  Woman  Tamer  Circus  Prince  Dream  Creepy  Jungle
Person  Male  Mad  Insect  Crown

***Only when this is completed please turn over the page***.
SECTION 1. IMPORTANT: This is a memory task and the researcher is trusting you to be honest.

Please do not look back at the previous page.

Please complete this task silently—no discussion with anyone. Do not turn the page until you come to the end of the page and are instructed to do so.

Please circle the below words that you remember from the word list on the previous page.

Please put an X through the word if it was not present on the previous page.

Lion        Doze       Whiff       Aroma       Shutter       Tarantula       Throne       Nap       Scent
Sill       Curtain       Web       Queen       Man       Rage       Fury       Stench       Window
Smell       Arachnid       Woman       Tamer       Circus       King       Sleep       Spider       Tiger
Person       Male       Mad       Insect       Crown       Handsome       Anger       Roar       Temper
Monarch       Awake       Glass       Bed

***Only when this is completed please turn over the page***.
SECTION 2. IMPORTANT: This is a memory task, the researcher is trusting you to be honest.

Please do not look back at ANY of the previous pages.

Please complete this task silently—no discussion with anyone. Do not turn the page until you come to the end of the page and are instructed to do so.

Please circle the below words that you remember from the word list on the first page. Some words are highlighted in **BOLD**. These are the answers which the majority of people have chosen in this task on previous occasions. Feel free to circle different answers from the previous section 1, if you now remember them differently. This is a separate task. Please put an X through the word if it was not present in the word list.

Scent  Sill  Curtain  Web  Queen  Man  Rage  Hate  Stench
Window  Smell  Arachnid  Woman  Tamer  Circus  King  Sleep  Spider
Cub  Person  Male  Mad  Bug  Crown Handsome  Anger  Roar  Temper
Monarch  Awake  Glass  Bed  Lion  Doze  Whiff  Aroma  Shutter
Tarantula  Throne  Nap

***Only when this is completed please turn over the page***.
**Psychology REC ID: FYP 11-031**

**SECTION 3:** For each item, using the scale below, please make a √ (tick mark) in the space which corresponds to how much or little you agree with each of the following statements. Provide only one response for each statement.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

1. I rely on my memory to be correct.  
2. I sometimes doubt my memory.  
3. I believe I have a good memory.  
4. I often doubt my memory.  
5. I sometimes question the accuracy of my memories.  
6. I am confident in my memory.  
7. I believe in the possibility of false memory occurrence.  
8. I rely on my childhood memories.  
9. I rely on my short term memory more than my long term memory.  
10. I rely on my long term memory more than my short term memory.  
11. I believe my memory is always correct.  
12. Sometimes my memory may be inaccurate.  
13. Memory is reconstructive.  
14. My memory is a true reflection of past events.

***This section is complete, as is the task*** Thank you for your participation!