THE EFFECT OF SCHEMATIC EVENTS AND POST-EVENT INFORMATION IN THE MISINFORMATION PARADIGM

by

Peta J. Skujins

Thesis
Submitted to Flinders University
for the degree of

Doctor of Philosophy

College of Education, Psychology and Social Work

26 March 2018

TABLE OF CONTENTS

LIST OF TABLES

ABSTRACT

The current thesis examined the effect of schematic events within the misinformation paradigm. Previous research has shown inconsistent findings when examining schematic misinformation, with typical compared with atypical post-event information found to create a larger effect (e.g. Maras & Bowler, 2011), a smaller effect (e.g. Nemeth & Belli, 2006), or no difference (e.g. Hekkanen & McEvoy, 2005) in a misinformation paradigm. The use of initial (prior to post-event information) and final (after post-event information) memory tests allowed a comparison of memory reports to determine how the memory changed due to the post-event information. Additionally, the relationship that the initial memory had with conforming answers was examined.

Study 1 used schematic misinformation to determine the interaction between the event item and misinformation on the final memory report. It was shown that typical compared with atypical film items resulted in higher initial accuracy, however there was no effect of either the film or post-event information schemas on conforming answers. Due to several issues with the stimuli, and ceiling effects of initial accuracy and confidence, limited conclusions were drawn from this study.

Specific stimuli were created for the purpose of a schematic misinformation paradigm, so that items were counterbalanced as occurring during the film and post-event narrative. The new stimulus set overcame several of the problems found in Study 1, including reducing initial accuracy and confidence, increasing conforming answers, and the counterbalancing of items. These stimuli were used in Studies 2, 3, and 4.

Study 2 focused on the effect of schematic film items and post-event information on conforming answer; a similar method as Study 1 was used. Initial accuracy and confidence both affected conforming answers, with accurate and highly confident items less likely to become conforming answers than inaccurate and less confident initial items.

The film and misinformation schemas interacted in their effect on conforming answers, with a higher proportion of conforming answers for typical post-event information to a typical film item, compared with any other combination of typical and atypical film and post-event information items. Additionally, there was a trend towards a higher proportion of conforming answers for correct post-event information compared with misinformation when both were presented to an inaccurate initial item. Findings are discussed with reference to recall and recognition memory, and the discrepancy detection hypothesis.

A comparison between initial recognition and recall questionnaires was conducted in Study 3, which showed that the initial questionnaire condition did not affect conforming answers, and did not interact with the post-event information and initial accuracy variable. The initial questionnaire type did however interact with the film schema on initial accuracy, with greater accuracy for typical items in the cued-recall condition, and for atypical items in the multiple-choice recognition condition. Recognition in the initial questionnaire did not reduce the effect of correct post-event information on conforming answers.

Discrepancy detection was examined in Study 4, with participants completing a final questionnaire about either the film or narrative, and later asked to report any discrepancies they detected. Participants detected more discrepancies when their initial memory was accurate and highly confident, and gave more conforming answers when a discrepancy was detected. Additionally, participants who reported using the wrong source to answer the final questionnaire reported more conforming answers.

The effect of schemas on the initial memory and conforming answers are discussed in relation to the differing findings of the literature. Specific focus is given to the effects of discrepancy detection within a schematic misinformation paradigm.

DECLARATION

I certify that this thesis does not incorporate without acknowledgment any material previously submitted for a degree or diploma in any university; and that to the best of my knowledge and belief it does not contain any material previously published or written by another person except where due reference is made in the text.

…….

Peta J. Skujins

B. Psych (Hons)

ACKNOWLEDGEMENTS

Firstly I would like to thank my supervisors Paul Williamson and Neil Brewer for taking me on board during my honors year and then for my PhD. Your help developing my project, research skills, and especially my writing has been exceptional. Special thanks to Paul for putting up with frantic emails, silly mistakes, and irregular meeting times over the past several years.

I have also had help throughout my candidature from several work experience students who have patiently collected and coded data and helped create the films used in my latter studies. I would also like to acknowledge the help of Miles, who's assistance in planning and creating the films made them possible. Thanks also to Damian, Dave, and Simon for being excellent "robbers", and to my Aunt for lending me her house to be "robbed".

Many thanks to my family for putting up with my terrible jokes about statistics and memory, and to my friends for only rarely asking me if we could please discuss something other than my thesis. Additional thanks to my parents and Shell for giving me the run of the house, and not complaining when I have taken over the living room to spread my work out.

Last but certainly not least, to Damian, for encouraging me, feeding me chocolate, and letting me rant about any slight problem I encountered, despite not knowing what I have been talking about. Without your support I wouldn't have got through this.

Chapter 1

General Introduction

Memory errors can occur for several reasons; the current thesis will focus on the misinformation effect with reference to memory schemas. The misinformation effect occurs when witnesses are presented with post-event misinformation, which is then later reported as having occurred during the event, instead of the correct items. One's schema of an event plays a role in attention allocation during the event, and in memory retrieval after the event. Some research has been conducted on schemas within the misinformation effect, however there is no consensus within the literature as to what role schemas play. We will examine initial memory of an event and consider characteristics of one's memory to further investigate the role of schemas within a misinformation paradigm.

Throughout this chapter several new definitions are introduced. Appendix 1 includes a table of key terms with their definitions, and key relationships between these terms. Some terms are used in this thesis in a limited manner. For example, we acknowledge that a schema is a memory system and is therefore internal to a participant. However, for sake of brevity we will refer to event stimuli and items with the schema they are *expected* to be interpreted with. This is made clear in Appendix 1, and should aid the reader throughout the thesis for comparisons of terms.

A Brief Introduction To The Misinformation Effect

The misinformation effect has been extensively studied since it was first reported by Loftus, Miller, and Burns (1978). In that study participants viewed a car accident where one vehicle failed to stop at a *yield* sign, but during a misleading question participants were asked about whether the vehicle stopped at the *stop* sign. Participants were more likely to inaccurately report a stop sign during a subsequent memory test if they had received this misinformation compared with participants who did not receive

misinformation; this is referred to as the *misinformation effect*. Subsequently, there have been many changes to the basic paradigm and extensive study of several factors affecting misinformation. In a typical misinformation paradigm the participants view an event either via slides or a film, which is followed by misleading post-event information. Participants are then asked to report the original event, but often responded with the misinformation rather than the witnessed item. The social contagion paradigm (Roediger, Meade, & Bergman, 2001) and the memory conformity paradigm (Wright, Self, & Justice, 2000) similarly examine the effect of misinformation on the memory. The key difference between the misinformation and social contagion/memory conformity paradigms is the method of presenting the misinformation. In the misinformation paradigm a non-social method such as a misleading questionnaire, interview or narrative is used. In contrast, in the social contagion or memory conformity paradigms, another person presents this information commonly in the form of a discussion between "co-witnesses". The results are generally similar, however these social differences need to be kept in mind.

A Brief Review of the Schema Literature

A memory schema is an underlying organization of knowledge about information, which helps us to interpret events and retrieve information from memory. The theory of schematic memory structures dates back to 1932 when Bartlett described a detailed structure of unconscious organization of memory. He proposed that these unconscious structures are used to understand new information. This is supported by the increased memory for events for which an individual has knowledge about, and the poor memory for abstract or new knowledge (Alba & Hasher, 1983).

Modern researchers have used Bartlett's work to expand and clarify memory processes accounted for by the schema. The current thesis will focus less on the schematic

structure of memory, and more on the false memory created by misinformation which is by its very nature schematic. It is therefore important to consider the structure of memory and the importance of schemas in memory processing to interpret the false memories created in a misinformation effect.

Alba and Asher (1983) gave a detailed account of schematic memory research, including the many ways in which schematic items and events can result in false memories. These include interpretation and comprehension, where the individual interprets an event through the lens of their schema, or comprehends aspects of the event due to this schema. They give the example of a typical misinformation paradigm where participants are presented with additional information after the event, which is interpreted through the lens of their schemata. They also discuss the information from an event being automatically integrated into the schemata thereby updating the memory schema used to comprehend the event. This are simply two ways in which memory schema influence memory of events that result in false memories.

More modern research has examined more subtle ways in which schematic memories can influence a memory report. In their meta-analysis, Rojahn and Pettigrew (2011) examine studies that compare the effects of schema-consistent and inconsistent items on recall and recognition tests. Recall tests and recognition tests corrected for guessing show an overall small advantage of inconsistent items, whilst recognition tests unadjusted for guessing show an advantage of consistent information. This is due to the schema based processing of items that allows increased recognition of consistent items when the participant guesses, but overall better memory for inconsistent items which contradict the initial schema and therefore cause additional processing. Several moderators were proposed that influence the overall relationship, importantly for the current studies: the order of items, proportion of inconsistent items, and the degree of

inconsistency (discussed further below).

Further, there are differences in the rates of incorrect answers to inconsistent and consistent items. Yamada and Itsukushima (2013) report that inconsistent items have better accuracy and are better distinguished from distracters compared with consistent items. Consistent items are elaborated on from the schema and are therefore more easily retrieved from the memory as incorrectly having occurred during an event. This demonstrates the importance of the schema in retrieving the item from memory, which with the points above indicates the importance of considering the application of schematic memory processes to misinformation research.

Schema Misinformation Research

When any event occurs, the occurrence is either new to the individual witnessing the event or is interpreted though the schematic memory (Alba & Hasher, 1983). This means that every event for which an individual has some knowledge is interpreted through the lens of their schema. Even when not explicitly examining schematic events and items, the memory researcher must consider that participants will be influenced by these existing knowledge structures. The false memory literature often focuses on a specific aspect of the memory, to the exclusion of other aspects. The current thesis attempts to integrate the misinformation effect with the understanding that crime events are schematic, and that participants will be influenced by their schemata when participating in memory studies. This is not a new approach in the misinformation literature; many researchers have either acknowledged or integrated schematic events into their work.

There are several important considerations from the schematic literature that apply in a misinformation context (each from Rojahn & Pettigrew, 2011). Firstly, the ordering of schematic items has been shown to affect the memory for those and surrounding items. The ordering of items in a misinformation study can therefore be explicitly manipulated,

or kept steady. A mix of these methods will be used in Studies 2 onwards where the film is shown in the same order but the critical items differ as to whether they are typical or atypical. The ordering of typicality therefore varies, but with both typical and atypical items occurring before the critical items for our studies.

The second factor of importance when applying knowledge of schematic memory systems in a misinformation context is the proportion of atypical items within an event. It seems intuitive that if you witness an event that has one atypical item, that item is going to stand out and will therefore be remembered differently compared with the many typical items within that event. There is no golden rule however as to the *best* proportion of typical and atypical items. We clearly need to have a large proportion of typical items, otherwise the event itself becomes so atypical that the schema we are intending may not be activated in the participants memory. An entirely atypical event by definition cannot occur without some form of priming as the event would not fit onto any preexisting knowledge base for that type of event. The current studies will therefore use events that are in the majority typical, with several atypical items embedded within them. The reader will note that the later studies use materials specifically created for this thesis, which include a larger number of atypical items in the script. These are not all used as critical items, to reduce participant bias regarding the items we test for.

The final point of importance is the degree of inconsistency of atypical items. This will be discussed in greater detail later in this thesis, however it is an important consideration from the start. Atypical items can be extremely atypical, or only slightly atypical. For example, when considering an event of attending a university lecture, it might be slightly atypical if the lecturer is dressed in a suit, but highly atypical if they are dressed in a unicorn body-suit. What is not often discussed, however, is the degree of consistency of a typical item. It is assumed that something that is typical simply is typical,

however I will argue that typicality itself comes in degrees. Again using an example to demonstrate, it may be slightly typical if you went to a bar and they served food, but highly typical if they served drinks. Items within an event should be considered on a scale, from highly typical to highly atypical, rather than being considered binary.

Typical, atypical, and irrelevant items. When a schematic event occurs, items within the event are either typical, atypical, or irrelevant. Schema typical items are those that are consistent with the schema whilst schema atypical items contradict this; nevertheless, both are schema-relevant. Schema irrelevant items are those that are not a part of the schema. For example, a bank robber wearing a dark jacket would be typical, whilst a bright jacket would be atypical. An irrelevant item would be the color of the robbers eyes, as this is not part of the schema.

Within the misinformation and social contagion paradigms participants are exposed to schematic information twice, once during the original event and once during the post-event information. Using the robber's jacket example, when participants viewed the film, they may have viewed a dark colored jacket, and the post-event narrative may state that the jacket was bright yellow (the misinformation). The item from the film had a schema (in this case typical) and the post-event information also had a schema (in this case atypical).

Aside from the schema of the misinformation presented in post-event information, post-event information has been presented in misinformation research in two different ways: added and contradictory misinformation. These types of misinformation relate differently to the original event and therefore to the schema of the original event. Added misinformation occurs when nothing occurred during the original event, therefore the schema of the misinformation item is the only schema affecting the memory. For example, if the robber was not wearing a jacket, the item from the film is that there was

no jacket, but added misinformation could be presented stating that the robber was wearing a dark jacket. Contradictory misinformation occurs when an item in the event is contradicted by the information.

If the item is schema-irrelevant the misinformation must also be irrelevant, however for either typical or atypical items the misinformation can be the same or the other schema. Again using the example of the robbers jacket, the robber having or not having a jacket is a part of the schema, therefore there is no possible schema irrelevant option for this item. If the eye color of the robber is irrelevant, thereby not being part of the schema, there are no possible typical or atypical (relevant) examples.

There are several key differences in the methods of the misinformation schema literature. Table 1 shows a summary of several articles in the area with some key methodological points and findings of interest. We will discuss the main findings, the definitions of schema used, the post-event information types, the tests given to participants, and the time point they are given.

Table 1

Summary of Key Articles with Methodological Points and Findings of Interest

	Paradigm	Schema	Post-Event Information Type	Test Type	Misinformation Effect	Other Results
Hekkanen and McEvoy (2005)	Misinformation	Typical vs. atypical	Added	Final source-monitoring recognition	Typical = Atypical	Accuracy: Atypical > typical
Huff, Davis, and Meade (2013)	Social contagion	High vs. low expectancy	Added	Initial category cued-recall Final category cued-recall followed by source-monitoring recognition	1 presentation: High expectancy > low expectancy 4 presentations: High expectancy = low expectancy	False recall: High > low expectancy
Luna and Migueles (2008)	Misinformation	High vs. low typicality	Added, contradictory	Final true/false recognition	Low > High	Conforming answer: Atypical film with typical misinformation > all others
Maras and Bowler (2011)	Misinformation	Typical vs. atypical	Added	Final free-recall followed by cued-recall	Typical > Atypical	Accuracy: Atypical > typical
Nemeth and Belli (2006)	Misinformation	High vs. low typical	Added, contradictory	Final cued-recall	Low > High	Conforming answer: Added = contradictory
Roediger et al. (2001)	Social contagion	High vs. low expectancy	Added	Final category cued-recall	High expectancy > low expectancy	False recall: High > low.

Definitions of schematic items. One major difference in the schematic misinformation literature is the definition and selection of schematic items. Although often described as distinct categories, schemas essentially fall on a scale (Rojahn & Pettigrew, 1992). Typical items are those that are consistent with the schema whilst atypical items contradict the schema, but each may be more or less so. Irrelevant items are separate from this scale, and have not been examined in the schematic misinformation literature and will be discussed later in this section. As discussed by Nemeth and Belli (2006), they used items that were schema-consistent (here referred to as typical) and schema-inconsistent (here referred to as atypical) as their high and low typicality items. In contrast Roediger et al. (2001) used high versus low expectancy items, which were all schema typical. When looking at the items used by Luna and Migueles (2008), several of the low typicality items are in line with the schema (e.g. bank robber carrying a gun) whilst others contradict this (e.g. bank robber reassuring the customers). Therefore, although all the items are indeed low typicality, when comparing them to the current definitions these are a mix of low typical and atypical items.

By considering schema-relevant items as more or less extreme versions of the schema we may be able to take into account differences caused by the level of expectancy of the item. Considering the findings of Roediger et al. (2001), it can be seen that typical items do not all act in the same way within a misinformation situation. Specifically, they found that highly expectant items resulted in a greater misinformation effect compared with less expectant items, despite all of these misinformation items being typical. If items are categorized as typical but are using all highly or less expectant items, results may inadvertently be affected. When comparing the effects of schematic misinformation in the literature and in future studies it is therefore important to consider the differing ways in which items may work depending on their characterization.

Post-event information types used in the schematic misinformation literature.

The different types of post-event information presented to participants within misinformation schema studies are also a source of potential variance within these findings. Added information occurs when the item is absent from the original event and misinformation is presented, this is different to contradictory information which directly contradicts the event. Nemeth and Belli (2006) found no difference between added and contradictory misinformation and no significant interaction with the item schema, although the interaction between the original and misinformation schemas for contradictory items was not considered. Luna and Migueles (2008) similarly found no difference between added and contradictory items, however when examining contradictory items found that typical misinformation presented to an atypical film item resulted in a higher misinformation effect compared with all other film and post-event information schema combinations. This shows there are differences between types of misinformation due to the presence or absence of schematic items in the original event.

The majority of schematic misinformation studies have examined added misinformation only. Although this allows for the isolation of the schematic post-event information from any schema influence of the original event, it does not allow for an understanding of the relationship between the event and post-event information. As shown by Luna and Migueles (2008) when the original event item is schematic the post-event information schema interacts with this. Both studies shown in Table 1 that have examined contradictory misinformation have shown a greater misinformation effect for atypical than typical misinformation (Luna & Migueles, 2008; Nemeth & Belli, 2006). Further investigation needs to be undertaken to determine the relationship between the original event and misinformation schemas, for added, contradictory, and correct post-event information, as well as for irrelevant items.

Memory test types used in the schematic misinformation literature. In the misinformation paradigm, both recall and recognition memory tests are used. In Table 1, it can be seen that free-recall, cued-recall, and category-cued recall tests have all been used, in addition to source-monitoring and true/false recognition tests. The main difference between recall and recognition tests is the presentation of the item within the test. In all varieties of the recall tests the participant is prompted to a lesser or greater degree to report items from the event. In contrast, during a recognition test the participant is asked to make a judgment on the item or items presented in regards to whether the item was presented originally or not, or where the item was presented.

Using different memory test types can create differing accuracy effects for schematic items. In a meta-analysis on the social schema literature, Rojahn and Pettigrew (1992) showed an advantage for schema-typical items when using a recognition test, but when using recall, the effect reversed with an advantage for schema-typical items. Although this was applied to social schemas generally and not to a misinformation paradigm, it is clear that the type of test used needs to be considered. Participants may unintentionally be biased towards one type of schematic misinformation depending on the tests used.

A further consideration of testing is the presence or absence of an initial memory test. Huff et al. (2013) compared groups who did or did not undertake an initial memory test in a schematic social contagion study. They found no effect of taking an initial memory test on final recall, but a positive influence on source-monitoring. They used added misinformation, however, so it was not possible for the test type to influence the original event schematic memory.

The type of test used may have a greater or different effect on contradictory misinformation compared with added misinformation. This is due to the two pieces of

schematic information present for contradictory misinformation, being the original event memory and the misinformation itself. Added misinformation does not have this original event memory. Therefore an interaction between the test types used (initial and final) and the two pieces of schematic information could occur for contradictory misinformation where it did not for added misinformation.

Schema-irrelevant items in the misinformation effect. When examining the affect of schemas on the misinformation effect, research has focused on schema relevant items but not on schema irrelevant items. On the other hand, the majority of misinformation literature that does not specifically examine schematic items uses irrelevant items. Relevant and irrelevant items may act in different ways in a misinformation effect as irrelevant items are usually not important to the main event. An example of this is the retrieval-enhanced suggestibility (RES) effect, where an initial questionnaire enhances the misinformation effect for items that were tested (e.g. Chan, Wilford, & Hughes, 2012). Using an initial questionnaire results in increased attention to the critical items, which in turn results in more misinformation being reported (Gordon & Thomas, 2014). When the effect of an initial questionnaire was used in a schematic social contagion study, Huff et al. (2013) found no RES effect. This supports the finding that RES occurs due to changes in attention during the presentation of post-event information, as schema-relevant items would be naturally attended to without the influence of an initial questionnaire.

The RES effect is one example of schema-relevant items acting in a different manner within a misinformation effect compared with irrelevant items. Without comparing the effects of relevant and irrelevant items it is difficult to identify other areas where they may act differently. One starting place for an examination of the differences is a comparison of misinformation answers between irrelevant and relevant items.

Without such a comparison we cannot determine how much of the literature using irrelevant items may also apply to schema-relevant items.

The current thesis is not examining the effects of retrieval enhanced suggestibility, as the main focus is on the misinformation effect itself, and schema relevant items secondly. Schema irrelevant items are used in the initial studies, therefore RES does need to be considered when interpreting the results. An increase in conforming answers for irrelevant items over relevant items may be due to RES.

Schemas on Initial Memory

Examining the effect of schemas on memory outside of the misinformation paradigm can aid in understanding the original, pre-misinformed memory. As discussed previously, any misinformation has to interact with the original memory to create a misinformation effect. The one exception is when misinformation is added, in which case, there is no original memory. It is often assumed that misinformation items are presented to similar initial memories. For example Rush and Clark (2014) used naturally generated misinformation between the participants, which showed that the initial memory for items is often inaccurate. Where the critical items are schematic we need to assume that there will be differences in the initial memory. This was also highlighted by Luna and Migueles (2008) who showed that schematic misinformation interacts with the film schemas, showing that the original event memory can play a role in the misinformation effect for schematic items.

Differences in the accuracy of schematic items occur for two main reasons: attention during the event, and retrieval of the memory. The schema helps direct attention during the event to confirm the presence of typical items, with additional attention to items that contradict the schema (i.e., atypical items). Irrelevant items are attended to the least as the schema does not aid in attention direction to these items. This also occurs for

post-event information. The increased attention to relevant items and specifically to atypical items increases the chance that the participant will encode this into the memory.

The schema also plays a role in retrieval of items, with relevant items being retrieved from both the specific episode and the schematic memory of which the schema is part. Typical items are specifically advantaged as they are consistent with the schema and are therefore easily retrieved from the semantic memory as well as from the episodic memory. Atypical items tend to be retrieved easily from the episodic memory and may also be recalled from the schema as an odd or surprising case (Rojahn & Pettigrew, 1992). Reporting of typical items that did not occur during the event also occurs (Tuckey & Brewer, 2003), showing that the schema is often incorrectly used for item retrieval.

Misinformation Types

As discussed earlier, added and contradictory misinformation have been used in schematic misinformation studies as well as other misinformation studies (e.g. Gabbert, Memon, & Wright, 2006), however correct post-event information has rarely been examined. Misinformation occurs when the post-event information is different to the event item, but correct information is the same as the event item. Rush and Clark (2014) have demonstrated that correct items have a larger effect on the memory than misinformation, however without using specific schematic items. The misinformation used in their study was all added and were generated by the participants themselves during discussions. When an item was discussed that had not been recalled by the other participant it was considered a post-event information item, which was either correct or misinformation. Magner, Markham, and Barnett (1996) also found that accurate post-event information increased accuracy but did not specifically test this as a misinformation effect.

The difficulty of examining correct post-event information is that the initial

memory prior to the post-event information must be known. If the initial memory is not known we cannot determine if the participant is reporting the item because they remember it from the event or from the post-event information. As discussed earlier, knowing the original memory can be an advantage in regards to determining the effect of the original event on the memory. This is positive in regards to examining both correct post-event information and misinformation. A greater understanding of the role that the initial memory plays, and how this is affected by the original event, can help unravel the way that misinformation affects the memory rather than simply examining the final effect.

Correct post-event information can either be equivalent to added or contradictory misinformation, depending on the initial memory of the participant. Rush and Clark (2014) used added items that were either correct or misinformation, that the participant had not initially reported in the free-recall test. If the participant recalls an inaccurate initial item, however, the correct post-event information will contradict this. In this situation the difference between correct post-event information and misinformation is simply that one is accurate. That is, if the participant is initially inaccurate then correct post-event information is new to them, this acts in the same way as misinformation despite not being misinformation.

In a schematic misinformation paradigm, correct post-event information can only be of the same schema as the original item, in contrast to contradictory misinformation which can be either the same or belonging to the other relevant schema (unless the item is irrelevant, in which case both the film and misinformation will be irrelevant). Added and correct information therefore are only linked with a single schema, although this occurs twice for the correct post-event information. Contradictory items of the same schema are also equivalent to this, but when the original event and the misinformation are of different schemas it cannot be compared with correct post-event information.

The potential effect of correct post-event information challenges the blanket term of the misinformation effect. If correct information also results in a misinformation effect it is somewhat counterintuitive to refer to it in this way. The term *conforming answer,* usually used in social contagion or memory conformity studies, more adequately covers both types of information. This allows for the inclusion of correct post-event information as a realistic alternative to misinformation in the misinformation effect which, as shown by Rush and Clark (2014), may occur more for correct post-event information than misinformation.

The Influence of the Initial Memory in the Misinformation Effect

For a misinformation effect to occur post-event, information must interact with the initial memory. Despite this, there is scant literature examining the effect of the initial memory in the misinformation effect. Those studies that have taken initial memory tests have often not directly examined the effect of the initial memory. For example Huff et al. (2013) took initial memory reports without directly examining the effect that the initial memory played. Similarly Magner et al. (1996) took initial reports from participants but did not specifically examine the relationship between the initial memory and the report of misinformation.

Wright and Villalba (2012) examined the effect of the initial memory report in the misinformation effect, and found that initial answer confidence and initial answer accuracy interacted in predicting misinformation. Specifically, a higher rate of misinformation was found for low confident and inaccurate initial memories than any other combination. This study did not use schematic items, however, so a RES effect cannot be discounted as an influence on these items. If a participant is inaccurate and has low confidence in their memory, it would stand to reason that they would seek out additional information to supplement their memories. This would especially apply for

irrelevant items that are asked about in an initial memory test, as participants would not be expecting to be asked about these. In contrast schema-relevant items would be attended to naturally during the post-event information regardless of their initial memory, however it would stand to reason that a similar effect would occur for relevant information.

In a schematic misinformation paradigm, the original event would affect the initial memory which, in turn, would interact with the post-event information to create the misinformation effect. The effect found by Luna and Migueles (2008), that typical misinformation presented after an atypical event item causes the highest misinformation effect, may be due in part to the initial memory for atypical items. If the effect of the initial memory was specifically evaluated, this could be determined. Furthermore, initial testing allows for additional investigation into the effects of added misinformation when the original item does not exist, and into contradictory misinformation and correct post-event information that can be given to either accurate or inaccurate initial memory reports.

Memory Characteristics Measures

Remember and *know* judgments have been used to differentiate between the episodic and semantic memory systems (Tulving, 1985). Remember judgments should be reported when the item is retrieved from the memory with distinct episodic detail, whilst know judgments should be reported when the item is familiar but no episodic detail accompanies it. The use of a guess judgment in forced-report memory tests allows participants to indicate which items they have no memory of and which they guessed an answer for.

Remember, know, guess (RKG) judgments have been used with some success in misinformation studies, with Paterson, Kemp, and Ng (2011) and Roediger et al. (2001) both reporting that conforming answers were more likely to be reported with know rather than remember judgments. Nemeth and Belli (2006) suggested that schema relevant

misinformation items are reported with both remember and know judgments, which seemingly contradicts the idea that relevant items are easily retrieved from the semantic memory and therefore falsely reported with a know judgment.

When reporting the final answer, the RKG judgment may be affected by the schema of the film and the post-event information, as well as whether the answer is conforming or not. Using a free-recall test within a social contagion paradigm, Paterson et al. (2011) reported that know judgments were significantly less likely to be accurate, and were more likely to be conforming than a remember judgment. This study only used schema-irrelevant items, therefore limiting the applicability to schematic events. Roediger et al. (2001) demonstrated that conforming answers and inaccurate answers are both reported with know judgments more frequently than remember judgments. In addition, they found that high-expectancy items were reported with more know judgments compared with low-expectancy items.

Confidence is another memory characteristics measure that has been used with useful results in misinformation studies. As previously discussed, Wright and Villalba (2012) showed that the initial confidence of a participant's memory was related to whether they reported a conforming answer. When a participant gives a confidence rating for an item they are likely to base this on the ease of retrieval of the item and the accompanying detail with the item. This will therefore be related to remember and know judgments, but may be both easier for the participants to use and may also pick up on additional variance in the participants memory. For example, when reporting an atypical item the participant may be less confident that this is correct than a typical item, regardless of the level of detail retrieved with this item.

Overview Of The Current Thesis

Four study chapters are included in the current thesis. Studies 1 and 2 both

examined the relationship between schematic misinformation and the schema of the film items. The same basic methodology was used in both: Participants viewed a film, answered a questionnaire about the film that included memory characteristics measures, read a post-event narrative that included misinformation, and then completed another questionnaire about the film again with memory characteristics measures. These studies compared the effects of misinformation and correct post-event information, and determined if these interact with the schema to affect conforming answers. The memory characteristics measures were used to help determine which types of memories are most susceptible to conforming answers, and to aid in understanding the difference in retrieval of conforming and non-conforming items from memory.

Study 3 focused on the differences caused by using cued-recall or recognition tests prior to the presentation of the post-event information. Differences between contradictory misinformation and correct post-event information were of particular interest in this study, with potential differences between these changed by the effects of the initial memory tests. Study 4 then examined discrepancy detection within the misinformation effect, again comparing contradictory misinformation and correct post-event information. Differences between the film and post-event information schemas were also considered, and the effect of detected discrepancies on conforming answers examined.

An Introduction To Multilevel Modeling

Because the analyses used in the thesis are relatively new in the area, a brief introduction is provided to facilitate the readers understanding of the statistical analyses used. A multilevel modeling approach was used for the majority of analyses in this thesis, unless specified otherwise. At a broad level, these analyses can be seen as an extension of multiple linear regression (or ANOVA) or logistic regression depending on the measurement of the outcome variable. This extension of regression uses individual trials,

rather than means or proportions aggregated across trials, as data points (Baayen, Davidson, & Bates, 2008; Bickle, 2007). It presents many advantages over the standard ANOVA or least-squares regression approach. This is critical when one is looking at the within individuals relationship between a predictor variable that varies across items and the outcome variables measured for each item. Mixed-effects analyses were undertaken using the lme4 package (Bates, Maechler, & Bolker, 2011) in R, an open-source language and environment for statistical analysis (R Development Core Team, 2011). In addition, for dichotomous outcome variables (e.g., conforming answers, accuracy), a binomial distribution with a logit link function was used for all analyses. Participant and item were treated as random effects (for further discussion, see (Baayen et al., 2008). The exception was for predictor variables with levels that were uniquely tied to an item, such as in Study 1. In that case, because items are confounded with the predictor variable, random effects were only modeled for participant. To assist with interpretation, estimated means and proportions were calculated from the mixed-effects regression coefficients.

A model building approach was undertaken similar to that used in hierarchical multiple regression (and underpinning standard ANOVA) where higher-order effects are analyzed controlling for lower-order effects. Thus fixed effects are tested by comparing two models that are nested within the other using a chi-squared goodness-of-fit test. For example, suppose one has two predictors, X and Z, and an outcome variable, Y. The following five regression models are fitted (for simplicity, we ignore the error variances; *c* represents the constant):

(1) $Y = c$

(2) $Y = c + b_1X$

(3) $Y = c + b_1Z$

(4) $Y = c + b_1X + b_2Z$

(5) $Y = c + b_1X + b_2Z + b_3XZ$

Model (1) is referred to as the null model. In the null model, for a continuous outcome, the predicted value (*c*) is the mean whereas it is the proportion of those coded as 1 for a categorical outcome. To test the effect of X on Y, model (2) is compared with model (1). To test the effect of Z on Y, model (3) is compared with model (1). Comparing model (4) with either model (2) or model (3) tests the additive effect of Z or X on Y after controlling for X or Z, respectively. To test the interaction between X and Z, model (5) is compared with model (4). If a significant chi-square result occurs, this provides evidence that the two models are not equivalent and the added variable significantly improves prediction of the outcome. The model is then examined to test the individual effects of each variable after controlling for any other variables in the model.

Two simple examples using just one predictor are shown below to demonstrate the general analytical strategy. Figure 1 uses confidence as the outcome variable with accuracy as the categorical predictor. Figure 2 uses accuracy as the outcome with the film item as the predictor. These analyses are both taken from Study 1, and the lines of code are shown in italics.

Furthermore, when both the predictor and outcome variables are measured on a continuous scale, the analyses are carried out using standard (Z) scores for both the predictor and outcome. This facilitates the interpretation since the regression coefficient is equivalent to a correlation coefficient, albeit accounting for the nesting of items within individuals.

```
m1<-lmer(InitialConf~(1|IDcode))
m1
Linear mixed model fit by REML
Formula: InitialConf ~ (1 | IDcode)
  AIC  BIC logLik deviance REMLdev
 3300 3312  -1647     3297    3294
Random effects:
 Groups   Name        Variance Std.Dev.
 IDcode   (Intercept)  56.246   7.4997
 Residual             938.325  30.6321
Number of obs: 339, groups: IDcode, 38
Fixed effects:
            Estimate Std. Error t value
(Intercept)   77.116      2.061   37.41
m2<-lmer(InitialConf~InitialCorrect+(1|IDcode))
anova(m1,m2)
Data:
Models:
m1: InitialConf ~ (1 | IDcode)
m2: InitialConf ~ InitialCorrect + (1 | IDcode)
   Df    AIC    BIC  logLik  Chisq Chi Df Pr(>Chisq)
m1  3 3303.5 3314.9 -1648.7
m2  4 3219.8 3235.1 -1605.9 85.638      1  < 2.2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
m2
Linear mixed model fit by REML
Formula: InitialConf ~ InitialCorrect + (1 | IDcode)
  AIC  BIC logLik deviance REMLdev
 3212 3227  -1602     3212    3204
Random effects:
 Groups   Name        Variance Std.Dev.
 IDcode   (Intercept)  62.336   7.8953
 Residual             719.289  26.8196
Number of obs: 339, groups: IDcode, 38
Fixed effects:
                 Estimate Std. Error t value
(Intercept)        42.589      4.000  10.648
InitialCorrectYes  40.782      4.131   9.871
Correlation of Fixed Effects:
            (Intr)
IntlCrrctYs -0.875
```

Figure 1. Example R output for the effect of initial accuracy on initial confidence.

The items *m1* and *m2* show the models, where *m1* is the null model and *m2* is testing the effect of initial accuracy (*InitialCorrect*) on initial confidence (*InitialConf*). The participant (*IDcode*) is used as a random effect. Model 1 shows that the grand mean for initial confidence is 77.12. The comparison between the models shows that the inclusion of initial accuracy improves the model fit in explaining initial confidence ($\chi^2(1) = 85.64$, $p < .001$). The fixed effects provide the regression model. For the null model, *m1*, the regression equation is simply $Y_{pred} = 77.12$. This shows that the mean confidence in the whole sample is 77.12%. The significant fixed effect of accuracy for *m2* shows that confidence varies across the levels of accuracy. For *m2*, the regression equation is $Y_{pred} = 42.59 + (40.78*\text{InitialCorrect})$. Given accurate answers are codes as 1 and inaccurate answers are codes as 0, the estimated means, taking nesting into account, are as follows: inaccurate items ($M = 42.59$), accurate items ($M = 83.37$). The regression coefficient for the accuracy slope ($b = 40.78$, $SE_b = 4.13$, $p < .001$) reflects the difference between the means for. To facilitate interpretation, the standard deviations calculated at the individual level will also be reported to provide information about the variability in estimated means.

Furthermore, when both the predictor and outcome variables are measured on a continuous scale, the analyses are carried out using standard (Z) scores for both the predictor and outcome. This facilitates the interpretation since the regression coefficient is equivalent to a correlation coefficient, albeit accounting for the nesting of items within individuals.

Figure 2 shows an example for a dichotomous outcome variable of initial accuracy with a categorical predictor variable of the film schema which has more than two levels. The category that is coded with the lowest value is used as the reference category and each other level is compared with this. This is similar to standard approaches in multiple regression using dummy variables. To compare each level with the other levels the

predictor variable needs to be recoded so that the new reference group is coded with the lowest value. Because these analyses, like standard logistic regression, use a logit link function, the estimates of the proportion of accurate answers need to be calculated from the logit estimates reported using the inverse formula of the logistic transformation; specifically proportion = 1/(1+EXP(item estimate*(-1))) where the item estimate is the estimate for the intercept plus the estimate for the item level, and EXP is the exponential function. For example, to calculate the proportion of accurate answers for atypical items the formula would be: (1/(1+EXP((3.1918-1.8056)*(-1)) = .80).

From Figure 2, we can see that there is a significant effect of the film item on initial accuracy ($\chi^2(1) = 20.21$, $p < .001$). In comparison to typical items (.96; the reference group), atypical items (.80); $b = -1.81$, $SE_b = 0.66$, $p = .006$ and irrelevant items (.72); $b = -2.23$, $SE_b = 0.64$, $p < .001$ were reported with a lower proportion of accurate answers, however there was no significant difference with nothing items (.88; $b = -1.16$, $SE_b = 0.66$, $p = .08$). Nothing items occur when the item was not present in the film, therefore the correct response is "nothing".

```
m1<-lmer(InitialCorrect~(1|IDcode), family=binomial)
m2<-lmer(InitialCorrect~FilmItem+(1|IDcode), family=binomial)
anova(m1,m2)
Data:
Models:
m1: InitialCorrect ~ (1 | IDcode)
m2: InitialCorrect ~ FilmItem + (1 | IDcode)
   Df    AIC    BIC  logLik  Chisq Chi Df Pr(>Chisq)
m1  2 294.56 302.21 -145.28
m2  5 280.35 299.48 -135.18 20.207      3  0.0001538 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
m2
Generalized linear mixed model fit by the Laplace approximation
Formula: InitialCorrect ~ FilmItem + (1 | IDcode)
   AIC   BIC logLik deviance
 280.3 299.5 -135.2    270.3
Random effects:
 Groups Name        Variance   Std.Dev.
 IDcode (Intercept) 1.1089e-11 3.33e-06
Number of obs: 339, groups: IDcode, 38

Fixed effects:
                 Estimate Std. Error z value Pr(>|z|)
(Intercept)         3.1918     0.5891   5.418 6.02e-08 ***
FilmItemAtypical    -1.8056     0.6560  -2.752 0.005918 **
FilmItemIrrelevant  -2.2290     0.6425  -3.469 0.000522 ***
FilmItemNothing     -1.1617     0.6588  -1.763 0.077843 .
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Correlation of Fixed Effects:
            (Intr) FlmItA FlmItI
FlmItmAtypc -0.898
FlmItmIrrlv -0.917  0.823
FlmItmNthng -0.894  0.803  0.820
```

Figure 2. Example R output for the effect of the film schema on initial accuracy.

Establishing sample sizes

Due to the multilevel modeling used for data analysis in this thesis, we are not able to calculate the required sample sizes for each study as the formulas used to calculate sample size do not translate for these types of analyses. This is due to the different sample sizes used in each level of each model, rendering an overall sample size ineffectual (Snijders, 2005). Instead, the sample for each study will be determined by practicality; dependant on the number of conditions in the study, and the level of complexity of the study. Confidence intervals (95% CIs) will be presented for each analysis to indicate the population parameters for the statistic.

Chapter 2

Study 1: The Effect Of Schematic Items Within The Misinformation Effect

The first study aimed to explore the effect of misinformation on the memory of a schematic event using two memory tests (before and after the post-event information) to track changes in memory due to post-event information. Memory characteristics have also been measured to gain insight into the experience of recalling the memory items.

Introduction To The Method And Focus Of The Current Study

Schematic event used in this study. To examine the effects of post-event information on the memory of a schematic event it was important to use a film that included both schema-relevant and irrelevant items. As discussed in Chapter 1, several schematic misinformation studies have used events that include only typical and irrelevant items. There are several problems associated with this including introducing atypical misinformation when the film did not have any atypical items, and the inability to use contradictory misinformation for atypical items if they do not occur in the film. The current study will use the film created by Tuckey and Brewer (2003) depicting a bank robbery, which included typical, atypical, and irrelevant items. Slides from this film were used by Maras and Bowler (2011) in a misinformation study, however they used solely added misinformation whereas, in this study, both added and contradictory misinformation were included.

Choice of items. In addition to the added and contradictory misinformation, correct post-event information (items reported correctly in the post-event narrative) was also used. Furthermore, schema typical, atypical, and irrelevant items from the film were used as initial items to which contradictory misinformation or correct post-event information was presented. For added misinformation, nothing had occurred in the film

and, therefore, there was no film schema attached to these items. The film schema therefore referred to the schema of the item in the film, which affects the memory prior to the presentation of the post-event information.

The schema of the post-event information was separate from the film schema. Irrelevant contradictory misinformation and correct post-event information was only presented to irrelevant film items. Typical and atypical contradictory misinformation was presented to a film item of the same schema or the other schema. The same schema occurs for example when a typical misinformation item is presented to a typical film item, whilst an example of the "other schema" is a typical misinformation item presented to an atypical film item. The same schema is always a combination of misinformation and a film item where the schemas are the same, whereas misinformation presented to the other schema is always a combination of misinformation and a film item of two different schemas. By definition, correct post-event information is presented to an item of the same schema because they are the same.

Memory tests in the current study. Typically, the standard misinformation paradigm uses only one memory test. However, because one aim of the current study was to determine how memory changed due to post-event information, an initial memory test (i.e., taken prior to the post-event information) was also used. Using an initial memory test permitted the determination of the effect of the film on the initial memory, how the initial memory changed to result in the final memory, as well as how the post-event information affected the memory. To clearly understand the misinformation effect it is important to understand how the post-event information interacted with the initial memory, and gives context to the final memory report.

The term *misinformation effect* refers to the effect of misinformation on memory, however, in the current study we also used correct post-event information. As a

consequence, the term *conforming answers* will be used to encompass answers that align with both misinformation and correct post-event information. Without using an initial memory test there would be no way of determining a conforming answer to correct post-event information, as we would most likely assume that the participant had an accurate initial memory from the film. Therefore, an additional benefit of using an initial memory test was a greater ability to determine the effect of correct post-event information on the person's initial film memory.

Memory Characteristics Measures

Both questionnaires in the current study used cued-recall questions that were scored for accuracy, confidence, and remember, know, and guess judgments. The confidence measure was a simple 0-100% measure of memory strength that participants should have found easy to use. Higher confidence ratings should be given when the memory was vivid and easy to recall, whilst low confidence should be reported when the memory was difficult to recall or the participant was guessing an answer. The remember, know, and guess response similarly measured memory strength but by differentiating between the episodic and semantic memory processes, as discussed in Chapter 1. Remember judgments reflected items recalled with vivid episodic detail, know judgments reflected semantic memory, and guess judgments were made for items where the participant did not know the answer.

The remember, know, and guess judgment with which an answer was reported should be related to the accuracy of the answer. When the participant retrieved an answer with episodic detail and gave a remember judgment, the answer was likely to be accurate as the participant would have attended to this item during the film in order to encode this detail. The accuracy of items reported with know judgments were lower than for remember judgments as the participant was retrieving the item from semantic memory.

These items were more likely to be inaccurate as the item did not contain details from the film. Guess judgments would be given with the lowest accuracy as the participant could not retrieve a memory for that item and was simply guessing an answer.

Confidence judgments would similarly be related to the accuracy of an item. Items that were reported with high confidence would be done so as they were easy to retrieve from the memory, and because the retrieval was accompanied by of detail about the item. When an item was retrieved easily and with lots of detail it was also likely to be accurate. In contrast inaccurate items would be difficult or unable to retrieve from the memory, and would not be accompanied with episodic details. These would then be reported with lower confidence.

The initial memory characteristics measures were used for two main reasons: to determine how the film items are recalled by participants, and to examine what types of initial memories are more susceptible to the affects of post-event information. The memory characteristics will be further discussed in terms of these two factors below.

The hypothesis regarding the relationship between the initial memory measures is:

1. There will be a significant relationship between remember, know, guess judgments and accuracy, such that remember judgments will have the highest proportion of accurate answers, followed by know judgments, with guess judgments resulting in the lowest proportion of accurate answers, for both the initial and final measures.

Film Schema On The Initial Memory

The schema of the film items affected the initial memory for that item, and may interact with the post-event information to create the final memory including conforming answers. The schema directs attention whilst viewing the film, and plays a role in memory

retrieval. As discussed in Chapter 1, schema relevant items will have greater attention directed to them during the film compared with irrelevant items, which would result in higher accuracy for typical and atypical items. This would occur as attention during the film was necessary for the item to be encoded into the memory and then later retrieved. If the item was highly attended to, it is likely to be strongly encoded and easily recalled from episodic memory.

If schema relevant items (i.e. typical and atypical items) are encoded more strongly into the memory, or are easier to retrieve from the memory, they would be recalled with higher proportions of accurate items compared with irrelevant items. This would be due to the relevant items being retrieved from the memory quickly and easily, with little effort, and accurately. In contrast the irrelevant items would not be retrieved as easily, and may not be encoded into the memory at all. The items are therefore less likely to be reported accurately.

Differences in retrieval between schematic film items may be reflected in the remember, know, and guess measures. Typical items could be retrieved from either the episodic or semantic memory systems and should therefore be given with either remember or know judgments. Even when the film item was not encoded into the memory a typical item may be retrieved from the semantic memory system, even when inaccurate. In contrast, atypical items were unlikely to be retrieved from semantic memory without episodic detail as they contradicted the schema, although the episodic detail could be triggered through semantic memory. Irrelevant items were not part of the schema and therefore could not be retrieved or triggered through semantic memory and should therefore also be given with remember judgments when the item was recalled or guess judgments if it was not. To summarize, typical items can be reported with remember, know, and guess judgments, whereas atypical and irrelevant items should be reported

with remember or guess judgments only.

As discussed previously, “nothing” film items occur when no item was present in the film but post-event information was later presented. The correct answer to questions about these items was that nothing happened or existed, which was outlined in the instructions as an answer to some of the questions. Retrieving a memory of nothing would be a different experience to retrieving something that occurred. Participants may be less confident that they were correct, as not remembering an item was likely to occur when they had missed something in the film as well as when nothing occurred. They were also more likely to report know judgments because they may not be able to recall episodic details of nothing.

The hypotheses regarding the effect of the film schema on initial accuracy are:

2. The schema of the film item will affect initial accuracy, such that there will be a lower proportion of accurate answers for irrelevant items compared with both typical and atypical items.
3. The schema of the film item will also affect remember, know, guess judgments with typical items reported with a higher proportion of know judgments and therefore lower proportions of remember and guess judgments compared with atypical and irrelevant items.
4. Nothing items will be reported with lower confidence and a lower proportion of remember judgments compared with the other film schema items.

Film And Post-Event Information Schema's On Conforming Answers

Typical, atypical, and irrelevant schematic post-event information were used in the current study, in contrast to the majority of schematic misinformation studies that did not include irrelevant items, as discussed in Chapter 1. The schema of the post-event information was expected to affect conforming answers, with irrelevant items resulting

in more conforming answers compared with typical and atypical items. Irrelevant items were less likely to have a strong initial memory to compare the post-event information to, and the participants may have been more likely to accept them as correct as they were not part of the schema. This would then lead to a higher proportion of conforming answers.

The type of post-event information may also affect how the film and post-event information schemas relate to each other. Added misinformation of all three schemas were used for the nothing film items, therefore the misinformation has a schema for added items but the film item does not. In contrast, contradictory misinformation for relevant items could be either the same (matched) or the other (mismatched) schema as the film item. That is, typical contradictory misinformation could be presented to either a typical or atypical film item, and atypical contradictory misinformation could be presented to either an atypical or typical film item. Contradictory irrelevant items could only be presented to other irrelevant items due to the nature of the schema, with the item being irrelevant throughout the whole event.

The interaction between the film and post-event information schemas were examined without irrelevant items to which the schema of both items must be the same. This leaves typical, atypical, and nothing film items, and typical and atypical post-event information. The film and post-event information items of the *matched* schema would result in a higher proportion of conforming answers because the items were less discrepant and more likely to be accepted by the participants. The effect of the nothing film items is exploratory as these did not fall into the matched or mismatched schema categories, therefore they could have worked in a different manner.

The effect of the post-event information schema on conforming answers was examined in isolation and also in conjunction with both the post-event information type and the film schema. This allowed for comparisons with the literature in regards to the

effect of the post-event information schema, in addition to understanding the more complex effects that occurred.

The hypothesis regarding the effect of schemas on conforming answers is:

5. The highest proportion of conforming answers will occur when the film and post-event information schemas are matched (i.e. a typical film item and typical post-event information, or atypical film item and atypical post-event information) compared with a mismatched schema (i.e. a typical film item and atypical post-event information, or an atypical film item and typical post-event information). The effect of the nothing film items is exploratory.

Initial Memory On Conforming Answers

Using an initial memory test in the current study allowed us to determine the effect of the initial memory on the final memory report, specifically on conforming answers. As discussed in Chapter 1, few misinformation studies examined the effect of initial accuracy and confidence on conforming answers, and none have done so using a schematic event. Three initial memory measures were used in the current study: accuracy, confidence, and remember, know, and guess judgments. The accuracy of an initial item was expected to affect whether a conforming answer was reported for the item, as accurate answers would be more likely to be maintained throughout the study. Participants would be less likely to consider the post-event information as plausible if they had an accurate memory of the occurrence, and may not attend to the post-event information for the item if they were sure of their answer. In contrast, if they did not remember the film, they would most likely report an inaccurate initial answer and may have sought additional information about this item in the post-event information, or accepted the post-event information as accurate if they do not know what the correct item was.

The confidence and remember, know, and guess judgments would be strongly

related to each other as well as to the accuracy of an item, as discussed previously. It was therefore important to take into account the effect of initial accuracy on conforming answers when examining the effects of the other measures. These exploratory analyses determined if the experience of recalling the item affected conforming answers additionally to accuracy. Given that people were more likely to provide conforming answers to the post-event information when they had fewer memorial clues to what they saw originally, it was expected that fewer conforming answers would occur for items judged as remembered, with a greater proportion of conforming answers occurring for items judged as guesses. Likewise, higher initial confidence would result in fewer conforming answers.

The hypothesis regarding the effect of the initial memory on conforming answers is:

6. Initial accuracy of an item will affect the proportion of conforming answers, with accurate initial answers resulting in a lower proportion of conforming answers compared with inaccurate initial answers.

The Use Of Post-Event Information Types In The Misinformation Effect

The usual focus of misinformation studies is misinformation, without much consideration for the effects of correct post-event information on the memory. As discussed in Chapter 1, conforming answers could not occur for correct post-event information to an accurate initial memory as the participant was maintaining their initial answer, not changing it to reflect the post-event information. Rush and Clark (2014) found a greater effect of correct post-event information compared with added misinformation on conforming answers. As discussed in Chapter 1, they used a free-recall test initially, therefore, we do not know if the participant remembered the item accurately or if they withheld it. The initial memory may have been accurate but not reported, therefore correct

post-event information that contradicted an inaccurately reported answer may act in a different manner. Furthermore, in the current study we also examined confidence and remember, know, and guess judgments so we were able to examine how this correct information impacted upon memory reports even when the participant did not report a conforming answer.

As discussed previously, the misinformation type may have affected the way in which the film and post-event information schemas interact, due to added misinformation only being presented to nothing film items but contradictory misinformation being either matched or mismatched to the film schema. When correct post-event information was presented for an item the schema was necessarily the same for the film item and post-event information, as they are the same thing. These items may therefore have worked in the same way as the matched schema contradictory misinformation.

The examination of correct post-event information was somewhat exploratory, as correct post-event information may have acted in a similar or different way to misinformation. If the participant had an inaccurate or no memory for the initial item, both the misinformation and correct post-event information items would be new to the participant and should therefore work in the same way. When an inaccurate initial answer was reported the participant may have made a reporting or retrieval error, but the accurate answer may have a memory trace. In this case the misinformation and correct post-event information would work in different ways.

No differences have been reported in the literature between added and contradictory misinformation for schema-relevant items (see Chapter 1). However, when using irrelevant items, added misinformation had been shown to result in a higher proportion of conforming answers compared with contradictory misinformation (Gabbert et al., 2006). Contradictory and correct post-event information items could be compared

to an initial memory of an item whilst added items were compared to a memory of nothing. Differences in conforming answers between the two misinformation types and correct post-event information would therefore be predicted for irrelevant items with more conforming answers for irrelevant items, but not for schema-relevant items.

The post-event information type would affect the final confidence with which the item was reported. When the post-event information was the same as the initial memory, as is the case for correct post-event information presented to an accurate initial memory, participants increased their confidence and reported high final confidence. In contrast a new piece of information such as misinformation may have decreased confidence resulting in lower final confidence.

The hypotheses regarding the effect of the post-event information type on conforming answers, and the effect of conforming answers on the final memory characteristics, are:

7. The proportion of conforming answers will vary by the post-event information type presented to participants, such that added misinformation will result in a greater proportion of conforming answers compared with contradictory misinformation and correct post-event information for irrelevant items, but not typical and atypical items.
8. The post-event information type will affect final confidence, with added and contradictory misinformation resulting in lower final confidence compared with correct post-event information.

Final Remember, Know, And Guess Judgments, And Change In Confidence

The change in confidence from the initial to the final memory tests was be calculated by taking the difference between these, and gave us an understanding of how participants changed their answers across the study. Remember, know, and guess

judgments and the change in confidence were useful in understanding the experience of recalling conforming or non-conforming answers, and answers of different schemas. Exploratory analyses were conducted to determine if there were differences between participants who maintained an inaccurate answer, an accurate answer, or who reported a conforming answer on the memory system they reported retrieving the item from (through the remember, know, and guess judgments) and the change in confidence that they had in their answer.

Study Samples

As part of this study two separate samples were examined. The first and larger sample completed the study in a single session, whilst the second and smaller sample completed the study in two sessions spanning a week. The variation between the two samples are due to several reasons, with the researcher attempting to rectify some problems with the first sample through the use of the second sample. However, due to further difficulties with this sample the study was completed without the variation. The problems with the first sample included: flaws in the materials (films) for the purpose of the current research; participant's answers' showing a lack of understanding of the task; an overall lack of misinformation reported using an initial coding scheme (this changed when the final coding scheme was introduced); and for the second sample participants only completing a single session. Resourcing for this study was limited and the researcher needed to make a decision regarding the viability of continuing. It was therefore decided to complete the study as a preliminary task and use the learning of the experience to better serve in further research.

Method

Participants

In total 44 participants (28 Female, 16 Male) were recruited from Flinders University, South Australia and were paid an honorarium for their time. These participants were run as two separate samples, 35 who completed the whole study in one session, and 9 who completed the study with a week's delay between sessions.

Design

The experiment used a 3x3 within-subjects design. The independent variables were the misinformation type and misinformation schema, and the main dependant variable was conformity status.

Materials

Film. The film developed by Tuckey and Brewer (2003) was used as the crime event in the current study. The film shows two people entering a bank, taking money from a teller, then fleeing on foot and by bus. Several schema typical, atypical, and irrelevant items are included in the film, which runs for approximately 59 seconds. A list of validated items can be found in Tuckey and Brewer (2003), which is the source of the critical items used in the current study.

Cued-recall questionnaires. Participants were asked 36 questions in total, 9 critical items and 27 filler items. The final memory test specified that participants should answer from their *memory of the film*, but this instruction was not included in the initial memory test. The questions in the initial and final memory tests were the same, therefore the participants answered the same questions in the same order, twice.

Participants were required to give a short answer to each question, even if they had to guess the answer. They also gave a confidence judgment on a scale of 0 to 100%,

and a remember, know, or guess judgment. In addition, each participant were asked to justify his or her remember, know, or guess response. An example of a question is given below:

What type of bank was robbed?

_____

How sure are you that your response is correct? (Please circle)

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Extremely Unsure — Extremely Sure

Please circle your memory judgement.

Remember Know Guess

Please explain this answer:_____

_____

Instruction booklet. A separate instruction booklet was used to train participants to use the remember, know, guess responses, which is given in Appendix 2. The instruction booklet gave descriptions of when to use each judgment and why, with several examples. Participants were asked to give a remember judgment when they could recollect vivid detail of the item, a know judgment if the item felt familiar but they could not recollect vivid detail, and a guess judgment if they didn't have a memory of the item. At the end of the booklet a short test was given; participants had to choose the most relevant remember, know, or guess judgment for the situation. The researcher went over the answers with participants to ensure they understood the judgments.

Post-event narrative. A written narrative was used to present the post-event information. The post-event information comprised three correct items and six misinformation items. The misinformation items either contradicted (3 items) a detail from the film or added (3 items) a detail that hadn't existed in the film. The correct post-

event information items reported the item as it was seen in the film. Several questions were given at the end of the narrative, for example "How confident do you think the person that wrote this was in his or her own memory?" with five options ranging from "Very Confident" to "Very Unconfident". These were included so that the participants read the narrative with enough attention to be able to respond to these questions, ensuring they were exposed to the post-event information.

Procedure

Each session was run with one to six participants who were told to work independently and not talk during the session. Participants initially watched the film of the bank robbery on a large screen in a tutorial room. Immediately after the film, participants were asked to read the remember, know, guess instruction booklet and complete the sample test. For the duration of the study they kept the remember, know, guess instruction book to refer to if they needed. The researcher checked the sample test and went through the answers with the participant if necessary.

Then the participant completed the initial cued-recall test. Once the initial cued-recall test had been handed to the researcher the written narrative was given to participants. Next the final cued-recall test was completed. Finally, participants were debriefed and reimbursed $15 for their time.

Scoring

Accuracy. Initial and final items were scored as accurate or inaccurate. If the item was too vague to score it was treated as missing in the data set.

Conforming answers. Conforming answers were scored by the researcher by comparing the initial and final cued-recall tests with each other and the post-event information. A conforming answer substantially reflects the post-event information and has been changed from the initial to the final memory report. An example of a conforming

item would be where the initial memory report was of a yellow jumper, the misinformation item was of a black jumper, and the final memory report was: a black jumper, a "dark jumper", or something similar to black but un-similar to yellow (e.g. a "navy blue jumper").

If the post-event information was different to the initial answer, a conforming answer could be reported. That is, conforming answers could occur for inaccurate initial answers to which either correct post-event information or misinformation was presented, or for an accurate initial answer to which misinformation was presented.

Remember, know, or guess judgments. The participants explanation of their remember, know, or guess judgment was used to score this item. Two researchers scored the explanations and discussed any discrepancies to determine a score. The guidelines given to participants were used as the basis for scoring. After a discussion of their reasoning, the two researchers did not disagree on any coding decision for the remember, know, or guess judgments.

Where the participants circled judgment varied from the researcher's decision, the researcher's decision was used, unless there was not enough information given for this to occur even when it was indicated that the participant had circled the incorrect judgments. For example, the participant might have circled "know" but reported that they "just remembered it clearly" which would indicate a remember judgment should have been given. However in this example not enough information is given by the participant to clearly determine a correct judgments.

The most common changes of remember, know, and guess judgments was when the participant had reported for example a blue jumper (it was yellow), circled "remember", but then reported that the remember that they didn't see that part and were guessing. These types of responses were then changed to "guess".

Non-Inclusion Of Data. Several items were treated as missing in the data set for the following reasons: (a) The participant changed their answer, but this didn't reflect the post-event information; (b) The final question was knowingly answered about the post-event information (determined from the remember, know, or guess explanation); (c) The answer was too vague to score; (d) The answer did not relate to the question asked.

Results

The following results section is split into three sections: Memory report prior to the presentation of post-event information; the misinformation effect; and the memory report after the presentation of post-event information. Film schema items can be schematic or nothing (i.e. an item that does not exist in the film); the nothing items then become added misinformation. That is, any nothing film items correspond directly to added misinformation.

The subscript "adj" is reported wherever the statistic is adjusted by accuracy. This occurs when accuracy is used in a prior step of the model, thereby showing the effect of the variable when accuracy is statistically controlled for.

Additional analyses for each of the studies presented in this thesis are reported in Appendix 3. These analyses do not relate to hypotheses and are presented for the interest of the reader only. Due to the limited samples presented in each study it is important that the reader interprets these results as an indication of possible effects, for further research.

The following results include two samples, those who completed the study in one session and those who received a week's delay between the initial session (film and initial questionnaire) and the second section (post-event information and final questionnaire). All analyses were run including the delay (none versus one week) as an interaction term; for all analyses, the interaction was not significant with $p > .08$ unless otherwise reported.

As discussed in the Introduction to Multilevel Modeling in Chapter 1, categorical variables with three or more levels are dummy coded into binomial variables for the purposes of the analyses used.

Memory Report Prior To The Presentation Of Post-Event Information

Film schema on initial accuracy. The effect of the film schema on the accuracy of participant's initial answers was significant ($\chi^2(3) = 20.21$, $p < .001$). The proportion of

accurate answers given by participants was higher when they were presented with typical film items (.96, 95% CI = .88, .99), compared with atypical items (.80, 95% CI = .62, .92); b = -1.81, SE_b = 0.66, p = .006, and irrelevant items (.72, 95% CI = .40, .86); b = -2.23, SE_b = 0.64, p < .001. There was no significant difference in the proportion of accurate answers given for atypical and irrelevant items (b = -0.44, SE_b = 0.39, p = .25).

When an item did not exist in the film, a *nothing* item, the proportion of accurate answers given by participants (.76, 95% CI = .42, .93) was higher compared with irrelevant items (b = 0.10, SE_b = 0.39, p = .008), but not significantly different than both typical (b = -1.16, SE_b = 0.66, p = .08) and atypical items (b = 0.62, SE_b = 0.41, p = .13).

Table 2

Initial Accuracy and Film Schema on Mean (SD; 95% CI) Initial Confidence

	Initial Accuracy		
Film Schema	**Inaccurate**	**Accurate**	**Total**
Typical	62.25 (15.28; 31.19, 93.31)	90.46 (19.61; 58.91, 122.01)	89.34 [50.30_{adj}] (20.09; 72.18, 106.50)
Atypical	28.86 (34.06; 12.04, 45.68)	93.15 (14.81; 79.22, 107.08)	80.27 [47.75_{adj}] (32.96; 65.57, 94.87)
Irrelevant	45.03 (32.03; 20.02, 70.04)	83.17 (25.52; 64.16, 102.18)	72.63 [43.22_{adj}] (32.14; 51.97, 93.29)
Nothing	50.54 (50.77; 29.23, 71.85)	72.27 (33.61; 52.49, 92.05)	64.75 [33.81_{adj}] (33.94; 40.36, 89.14)
Total	42.59 (32.73; 32.37, 52.91)	83.37 (26.99; 75.12, 91.62)	

Initial accuracy and confidence. The initial accuracy of a participant's answer significantly affected the confidence with which the answer was reported ($\chi^2(1) = 85.64$, p < .001). Shown in Table 2, inaccurate answers were given with lower mean confidence compared with accurate answers (b = 40.78, SE_b = 4.13, p < .001), as expected.

Initial accuracy and initial remember, know, guess. The relationship between initial remember, know, guess and initial accuracy was significant ($\chi^2(2) = 88.73$, $p < .001$). Shown in Table 3, remember judgments were reported with a higher proportion of accurate initial answers compared with know judgments ($b = -1.87$, $SE_b = 0.48$, $p < .001$) and guess judgments ($b = -3.22$, $SE_b = 0.43$, $p < .001$). Guess judgments were also reported with a lower proportion of accurate answers than know judgments ($b = -1.35$, $SE_b = 0.48$, $p = .005$).

Table 3

Proportion of Accurate Answers (95% CI), and Mean (SD; 95% CI) Initial Confidence by Initial RKG

Initial RKG	Initial Accuracy	Initial Confidence
Remember	.95 (.91, .98)	91.64 [85.95_{adj}] (15.53; 86.81, 96.47)
Know	.75 (.69, .82)	51.16 [51.75_{adj}] (28.10; 44.61, 57.71)
Guess	.44 (.34, .64)	23.39 [20.78_{adj}] (23.11; 17.26, 29.52)

The Misinformation Effect

The following analyses are reported both with and without controlling initial accuracy and confidence where appropriate, and are shown in Table 4. The subscript "adj" is reported wherever the statistic is adjusted by accuracy. The dependent variable in all analyses is conformity status.

Initial accuracy. Initial accuracy significantly affected the proportion of conforming answers reported by participants. As predicted, a greater proportion of inaccurate initial answers (.20, 95% CI = .09, .38) went on to become conforming answers compared to accurate initial answers (.03, 95% CI = .01, .06).

Initial confidence. The confidence with which the participant reported their initial answer significantly affected the proportion of conforming answers when statistically controlling for initial accuracy or not controlling accuracy. Items that became non-conforming answers (M = 80.39, M_{adj} = 47.87, SD = 28.99, 95% CI = 70.24, 90.54) were reported with higher initial mean confidence compared with items that became conforming answers (M = 44.67, M_{adj} = 25.63, SD = 38.21, 95% CI = 31.02, 58.32). There was no significant interaction between initial accuracy and confidence on the proportion of conforming answers.

Table 4

Initial Accuracy and Confidence, and Film and Post-Event Information Schemas on Conforming Answers, With and Without Controlling Initial Accuracy and/or Confidence

Predictor	**Variables Controlled**	**$\chi^2(1)$**	***b (SE)***
Initial Remember, Know, and Guess (df = 2) (R = Remember, K = Know, G = Guess)	None	23.77, $p < .001$	R-K: 0.88 (0.71), $p = .22$; G-R: -2.10 (0.54), $p < .001$; G-K: -1.22 (0.73), $p = .09$
	Initial Accuracy	38.89, $p < .001$	0.59 (0.75), $p = .43$; -1.51 (0.64), $p = .02$; -0.91 (0.76), $p = .23$
	Initial Confidence	16.68, $p < .001$	0.20 (0.80), $p = .80$; -0.52 (0.90), $p = .56$; -0.32 (0.84), $p = .71$
	Both	15.37, $p < .001$	-0.04 (0.82), $p = .96$; -0.06 (0.93), $p = .95$; 0.10 (0.86), $p = .91$
Initial Accuracy	None	18.52, $p < .001$	-2.04 (0.47), $p < .001$
Initial Confidence	None	12.64, $p < .001$	-35.72 (5.72), $p < .001$
	Initial Accuracy	26.87, $p < .001$	-22.24 (5.44), $p < .001$

Initial Accuracy * Confidence	None	0.01, *p* = .92	A[1]: -24.58 (6.85), *p* < .001; I: -19.14 (9.74), *p* = .03

Table 4 Continued

Predictor	**Variables Controlled**	**$\chi^2(1)$**	***b (SE)***
Film Schema **(df = 3)** (T = Typical film item, A = Atypical, I = Irrelevant, N = Nothing item)	None	1.31, *p* = .73	T-A: 0.17 (0.69), *p* = .81; T-I: 0.65 (0.64), *p* = .31; T-N: 0.29 (.62), *p* = .64
	Initial Accuracy	0.67, *p* = .88	-0.48 (0.75), *p* = .52; -0.13 (0.72), *p* = .86; -0.03 (0.66), *p* = .96
	Initial Confidence	1.01, *p* = .80	-0.45 (0.77), *p* = .56; -0.07 (0.71), *p* = .92; -0.52 (0.71), *p* = .46
	Both	1.15, *p* = .77	-0.82 (0.82), *p* = .32; -0.39 (0.74), *p* = .60; -0.50 (0.70), *p* = .48
Post-Event Information Schema **(df = 2)** (T = Typical post-event information, A = Atypical, I = Irrelevant)	None	0.26, *p* = .88	T-A: 0.19 (0.53), *p* = .72; T-I: 0.25 (0.52), *p* = .63
	Initial Accuracy	0.32, *p* = .85	-0.18 (0.57), *p* = .75; -0.31 (0.57), *p* = .59
	Initial Confidence	2.50, *p* = .29	-0.87 (0.66), *p* = .19; -0.88 (0.63), *p* = .17
	Both	2.61, *p* = .27	-0.87 (0.66), *p* = .19; -0.93 (0.64), *p* = .15
Misinformation Type **Note: Correct post-event information not included**	None	1.33, *p* = .25	0.52 (0.47), *p* = .27
	Initial Accuracy	1.22, *p* = .27	0.53 (0.49), *p* = .28
	Initial Confidence	3.23, *p* = .07	0.91 (0.53), *p* = .09
	Both	2.52, *p* = .11	0.82 (0.53), *p* = .13

Film and post-event information schemas. The effect of the film schema on conforming answers was non-significant. The effect of the post-event information schema

[1] A = Accurate, I = Inaccurate

on conforming answers was also non-significant.

The interaction between the film schema and post-event information schema on conforming answers was run after removing the irrelevant items as these items could only be presented to other irrelevant items, therefore could not be part of the interaction. In contrast to our predictions there was no significant interaction between the film and post-event information schema's on conforming answers ($\chi^2(2) = 1.71$, $p = .43$).

Post-event information type. The effect of post-event information type on conforming answers was significant ($\chi^2(2) = 23.77$, $p < .001$). Correct post-event information was separated from the data set and the analyses were re-run, as there were only three conforming answers (.03 proportion of conforming answers) to correct post-event information. With correct post-event information removed, there was no significant effect of post-event information type on conforming answers.

Table 5

Conforming Answers by Post-Event Information Type and Post-Event Information Schema (95% CI)

Post-Event Information Schema	Post-Event Information Type		
	Added	Contradictory	Total
Typical	.09 (.02, .15)	.04 (.01, .09)	.06 (.02, .15)
Atypical	.01 (.00, .08)	.06 (.01, .11)	.05 (.02, .11)
Irrelevant	.00 (.00, .06)	.15 (.09, .21)	.08 (.02, .18)
Total	.05 (.01, .18)	.08 (.02, .29)	

The interaction between the post-event information type and schema on conforming answers was significant ($\chi^2(4) = 14.91$, $p = .005$). The analysis was re-run without correct post-event information, again due to the low proportion of conforming answers. There was a significant interaction between the post-event information type and

schema on conforming answers when correct post-event information was removed ($\chi^2(2) = 7.14$, $p = .03$).

Simple effects analyses were conducted by comparing the post-event information schemas across added and contradictory misinformation separately, and also comparing the post-event information types for each schema separately. Shown in Table 5, for added misinformation, there was no significant difference in the proportion of conforming answers between typical and atypical post-event information items ($b = -2.41$, $SE_b = 1.54$, $p = .12$). When presented with irrelevant post-event information, a lower proportion of conforming answers resulted compared with typical items ($b = -3.69$, $SE_b = 1.84$, $p = .04$), but there was no significant difference compared with atypical items ($b = -1.28$, $SE_b = 1.63$, $p = .43$).

For contradictory misinformation there were no significant differences in the proportion of conforming answers between typical and atypical items ($b = 0.29$, $SE_b = 0.80$, $p = .72$), typical and irrelevant items ($b = 1.25$, $SE_b = 0.71$, $p = .08$), or atypical and irrelevant items ($b = 0.96$, $SE_b = 0.65$, $p = .14$).

When correct post-event information was presented to participants only three conforming answers resulted. All three were for atypical post-event information (.09 proportion of conforming answers), with zero to both typical and irrelevant information.

There was no significant difference between added and contradictory misinformation for both typical ($b = -0.89$, $SE_b = 0.88$, $p = .31$) and atypical ($b = 1.21$, $SE_b = 1.43$, $p = .40$) schematic post-event information. In contrast to our prediction, for irrelevant post-event information items added misinformation resulted in a lower proportion of conforming answers compared with contradictory misinformation ($b = 1.70$, $SE_b = 0.84$, $p = .04$).

Memory Report After The Presentation Of The Post-Event Information

Final confidence. The relationship between final accuracy and confidence was significant ($\chi^2(1) = 59.66$, $p < .001$). As expected, inaccurate answers were reported with lower mean final confidence compared with accurate answers ($b = 26.67$, $SE_b = 3.30$, $p < .001$), shown in Table 6.

Conformity status. There was a significant relationship between conformity status and final confidence ($\chi^2(1) = 23.97$, $p < .001$), showing that non-conforming answers resulted in higher mean final confidence compared with conforming answers ($b = -19.16$, $SE_b = 4.91$, $p < .001$), also shown in Table 6.

Table 6

Mean (SD; 95% CI) Final Confidence by Conformity Status and Final Accuracy

	Conformity Status		
Final Accuracy	**Non-Conform**	**Conform**	**Total**
Accurate	87.22 (20.90; 80.12, 94.32)	33.01 (28.11; 14.99, 51.03)	86.26 (21.65; 79.38, 93.14)
Inaccurate	58.04 (33.36; 49.07, 67.01)	61.50 (25.62; 49.17, 73.83)	59.59 (31.27; 51.23, 67.95)
Total	82.69 (25.37; 75.00, 90.38)	63.53[2] (26.21; 52.39, 74.67)	

This was qualified by a significant interaction between conformity status and final accuracy on mean final confidence ($\chi^2(1) = 6.99$, $p = .008$). Simple effects analyses were conducted by examining the effect of conformity status on final mean confidence for accurate and inaccurate answers separately, and also examining the effect of final accuracy for conforming and non-conforming answers separately. Shown in Table 6,

[2] Due to the nature of the statistical analyses used, the mean total can be either higher or lower than the reported sub-group means.

conforming answers were reported with no significant difference between inaccurate and accurate answers (b = 3.07, SE_b = 10.98, p = .39) on mean final confidence. Non-conforming inaccurate answers were reported with a lower mean final confidence compared with accurate answers (b = 28.83, SE_b = 3.68, p < .001).

Final accurate non-conforming answers were reported with higher mean final confidence compared with conforming answers (b = -21.18, SE_b = 6.27, p < .001). Inaccurate answers were reported with no significant difference between non-conforming and conforming answers (b = -0.37, SE_b = 8.35, p = .48) on mean final confidence.

Post-event information type. There was a significant effect of post-event information type on final confidence ($\chi^2(2)$ = 37.55, p < .001). Correct post-event information (M = 93.00, SD = 16.03, *95% CI* = 83.54, 102.46) resulted in higher final confidence compared with added misinformation (M = 72.96, SD = 29.10, *95% CI* = 61.46, 84.46); b = -20.04, SE_b = 3.25, p < .001 and contradictory misinformation (M = 78.72, SD = 25.98, *95% CI* = 69.28, 88.16); b = -14.28, SE_b = 3.24, p < .001. Contradictory misinformation was given with higher mean final confidence compared with added misinformation (b = -5.76, SE_b = 3.10, p = .03).

Final remember, know, guess. The relationship between final accuracy and final remember, know, guess was significant ($\chi^2(1)$ = 23.46, p < .001). Comparisons between accurate and inaccurate answers were made for each of the remember, know, and guess judgments separately, and are shown in Table 7. Specifically, remember judgments were compared with combined know and guess judgments; know judgments with remember and guess combined; and guess with remember and know combined. Inaccurate answers were reported with a significantly lower proportion of remember judgments (b = 2.38, SE_b = 0.32, p < .001), higher proportion of know judgments (b = -0.99, SE_b = 0.36, p = .006), and higher proportion of guess judgments (b = -2.82, SE_b = 0.39, p < .001)

compared with accurate answers.

Table 7

Proportion of Final Remember, Know, and Guess Judgments by Final Accuracy (95% CI)

	Final Remember, Know, Guess		
Final Accuracy	**Remember**	**Know**	**Guess**
Accurate	.83 (.73, .93)	.11 (.05, .17)	.05 (.02, .08)
Inaccurate	.31 (.18, .57)	.25 (.09, .33)	.45 (.25, .59)

Final confidence and remember, know, guess. The final confidence of the reported answers was also significantly related to the final remember, know, guess judgments given by participants ($\chi^2(2) = 353.87$, $p < .001$). Remember judgments ($M = 92.30$, $SD = 13.04$) were given with higher mean confidence compared with know judgments ($M = 67.46$, $SD = 17.97$); $b = -24.83$, $SE_b = 2.53$, $p < .001$, and guess judgments ($M = 32.84$, $SD = 25.86$); $b = -54.45$, $SE_b = 2.67$, $p < .001$. Know judgments were given with greater mean final confidence compared with guess judgments ($b = -34.62$, $SE_b = 3.47$, $p < .001$).

Conformity status. The relationship between conformity status and final remember, know, and guess judgments was significant ($\chi^2(1) = 23.46$, $p < .001$). Shown in Table 8, non-conforming answers were reported with a greater proportion of remember judgments ($b = -2.07$, $SE_b = 0.44$, $p < .001$), and lower proportions of know ($b = 1.63$, $SE_b = 0.45$, $p < .001$), and guess judgments ($b = 1.14$, $SE_b = 0.46$, $p = .01$) compared with

conforming answers.

Table 8

Proportions of Final Remember, Know, and Guess Judgments by Conformity Status

	Final Remember, Know, Guess		
Conformity Status	**Remember**	**Know**	**Guess**
Non-Conform	.77 (.65, .91)	.11 (.05, .16)	.11 (.05, .17)
Conform	.30 (.10, .58)	.39 (.16, .58)	.29 (.10, .48)

The interaction between the final accuracy and the conformity status of an item significantly affected final remember, know, and guess judgments ($\chi^2(1) = 3.80$, $p = .05$). Simple effects analyses were conducted by examining the effect of conformity status on each of the remember, know, and guess judgments separately for accurate and inaccurate final answers and are shown in Table 9. Remember judgments were compared with the combined know and guess judgments, know with the combined remember and guess judgments, and guess with the combined remember and know judgments. Accurate non-conforming answers were reported with higher remember ($b = -1.89$, $SE_b = 0.63$, $p = .003$), lower know ($b = 1.44$, $SE_b = 0.65$, $p = .03$), and no significant difference in guess judgments ($b = 1.39$, $SE_b = 0.83$, $p = .09$) compared with accurate conforming answers. Inaccurate non-conforming answers were given with no significant difference in remember judgments ($b = -0.90$, $SE_b = 0.81$, $p = .27$), know judgments ($b = 1.19$, $SE_b = 0.73$, $p = .10$), or guess judgments ($b = -0.36$, $SE_b = 0.67$, $p = .59$) compared with inaccurate conforming answers.

Table 9

Proportion of Final Remember, Know, and Guess Judgments by Final Accuracy and Conformity Status (95% CI)

		Final Remember, Know, Guess		
Final Accuracy	**Conformity Status**	**Remember**	**Know**	**Guess**
Accurate	**Non-Conform**	.85 (.40, .99)	.10 (.04, .20)	.04 (.01, .09)
	Conform	.45 (.20, .66)	.26 (.02, .58)	.16 (.02, .62)
Inaccurate	**Non-Conform**	.34 (.16, .50)	.19 (.06, .28)	.48 (.26, .64)
	Conform	.18 (.03, .46)	.43 (.13, .71)	.39 (.13, .69)

Discussion

In the current study two samples of participants were used, as discussed in the introduction. The first sample of 35 participants completed the study in one session, and the second sample of 9 participants completed the study in two sessions. The two sessions were organized so that during the first participants would view the film and complete the initial questionnaire, and after a week's delay, during the second session, they would be presented with the narrative containing the misinformation and then complete the final questionnaire. Despite this change, data collection on these 9 participants showed no difference in results. The implications of this will be discussed in regards to the materials used and plans for future research throughout the following sections.

The two samples were used in an attempt to fix some problems that were found after the majority of participants had completed the study, but were unexpected considering the use of the materials in other studies (e.g. Tuckey & Brewer, 2003). The delay for the second sample was introduced to counter the problems of high accuracy and confidence and low conforming answers, but had its own issues in the lack of participant completion of the study. The two samples have been included in the current chapter as a basis of discussion for future studies as there was very limited difference between the samples. The second sample was included in addition to the first (instead of removing the second sample entirely) to give additional power to the analyses, to avoid collecting further data and using up resources, and to demonstrate the learnings[3] that came from implementing an unsuccessful modification to the study.

The focus of the discussion will be on the effect of the items on both the initial and misinformed memories. In the first section, the effect of the film schema on the initial

[3] The researcher developed a better understanding of participant behaviour (in regards to arriving for sessions), of resourcing research and ensuring resources are prioritised to ensure the best outcomes, and to implementing modifications to a study without fully piloting the procedure.

memory will be discussed. Next, the effects of the film and post-event information schemas on conforming answers will be considered. Then discussion will focus on the type of post-event information presented in the context of its effects on final memory; followed by a discussion of the relationship between the initial and final memories. This will be followed by a discussion of the memory characteristics measures, specifically in terms of what they can tell us about the experience of recalling the memory items. Lastly, limitations of the current study will be addressed with an emphasis on how these will be overcome in future work.

Schema Effect On The Initial Memory Report

The schema of the film item significantly affected the initial accuracy of the item, and interacted with initial accuracy on initial confidence. In contrast to our predictions there was a difference in accuracy between typical and atypical film items, with typical items reported more accurately. Irrelevant items, as predicted, were reported with lower accuracy compared with typical items, however the irrelevant and atypical items did not significantly differ. There were no differences between typical and atypical film items on remember, know, or guess judgments, showing that despite recalling atypical items with lower confidence participants were experiencing the recall of both typical and atypical items in a similar manner.

The difference in accuracy between typical items and both atypical and irrelevant items could theoretically be attributed to either the attention given to the items during the film, or the retrieval of the items from memory. Typical items may have been attended to more highly during the film, thereby creating a stronger memory of the item which is then more likely to be reported accurately. These items may also have been easier to recall due to their ability to be retrieved from either episodic or semantic memory, however the lack of difference in know judgments does not indicate this.

Strong memories may be recalled from the episodic memory without using the semantic memory. From the confidence ratings we could see that remember judgments were given for highly confident, accurate memories. The interaction between accuracy and schema on initial confidence showed that accurate items were given with higher confidence for all schemas. This indicated that accurate items were recalled easily and strongly for all schemas. The largest difference between accurate and inaccurate answers was for atypical film items. This may indicate that atypical items were easily retrieved from the memory with accompanying detail when they were attended to during the film and therefore encoded into the memory. In contrast, when the item was not attended to the participant may be able to recall that something atypical occurred but not what it was, and would feel that this unusual occurrence is likely to be incorrect. It must be noted that inaccurate items may not have the same schema as the accurate film item, therefore participants may have reported a typical answer for atypical film items.

There were several issues with the item choice that may have influenced the results of the schema on accuracy and remember, know, and guess judgments. Typical items in the current study were chosen from the list of items given in Tuckey and Brewer (2003), while atypical items were those that contradicted one of the typical items. Additionally, the predominantly typical film may work to draw attention to the typical items to the detriment of the atypical and irrelevant items. For example, the only speaking in the film was an atypical item. This may have been missed by participants as they were not expecting sound and when it did occur the item was not something expected. This is a problem with using stimuli where the items cannot be counterbalanced. If both typical and atypical versions of the spoken item had been used in different versions of the film we would be able to determine if this was an effect of simply using a spoken item or if it was due to the schema of the item.

The lack of differences between remember, know and guess judgments between typical and atypical items may have occurred due to the instructions given for the judgments. Participants gave only one judgment per item and were instructed to respond with a remember judgment if they recalled any episodic detail. If an item was retrieved with both episodic and semantic detail, or only episodic detail, the judgments would be the same. If the lack of difference between typical and atypical film items is due to the nature of the remember, know, and guess judgments, this could be corrected in future studies by using separate measures of episodic and semantic memory. In the current study, participants were asked to report only one judgment, however semantic details can accompany episodic details, especially for typical items. If this was the reason for the lack of difference between typical and atypical items the use of independent scales in future studies could determine this.

Nothing film items. In addition to the effect of schematic items on the initial memory, nothing items were examined. These were items to which added post-event information was presented, where no item occurred in the film but an item was reported in the narrative. The post-event information had a schema, but the film item did not. For this reason, nothing items are similar to film items in terms of having an initial memory report, but differ in that they do not exist.

Nothing items were reported with accuracy rates between that of typical and atypical items, but not significantly different to either. The confidence with which nothing items were reported was lower than both typical and atypical items. Although nothing items were reported with high accuracy, participants were not confident in their answer. Participants were able to recall that nothing occurred during the event, but they were unsure whether this was correct.

The remember, know, and guess judgments for nothing items showed that they

were reported with a similar pattern compared with irrelevant items. Participants were able to retrieve a memory of nothing occurring with episodic detail, however they often knew or guessed the answer. When retrieving an inaccurate item when the accurate answer was nothing, the answer would be that something occurred. This means that the post-event information to this item was no longer added, as added misinformation means that the participant would not have a memory or had a memory of nothing for that item. When an inaccurate initial answer was given for a nothing item the misinformation became contradictory. This was a problem when using an initial memory test. Even when reporting that nothing occurred it was possible that the misinformation acted in a different manner compared with a situation where participants were not asked to report their initial memory. This will need to be considered in future studies if added misinformation continues to be used.

Film And Post-Event Information Schemas, And Post-Event Information Type On Conforming Answers

When misinformation was presented to the witness neither the schema of the film or the post-event information significantly affected conforming answers. The post-event information type similarly did not affect the pattern of results for typical or atypical post-event information on conforming answers, although contradictory misinformation resulted in a higher proportion of conforming answers for irrelevant items compared with added misinformation. Previous work in this area has shown conflicting results when comparing typical and atypical misinformation. This study supports the findings of Hekkanen and McEvoy (2005) and Huff et al. (2013) which showed no difference between typical and atypical misinformation on conforming answers.

The initial memory of participants gave us an indication as to why there was no effect of schema on conforming answers. Although the film schema did affect initial

accuracy, overall accuracy was very high. Irrelevant items were reported with the lowest initial accuracy, however over three quarters of answers were accurate. It could be that the high initial accuracy and confidence of the initial items precluded any differences in conforming answers.

Participants who were accurate and confident in their initial answer were less likely to report a conforming answer than those who reported inaccurate or low confident answers. That is, when the participant initially reported an inaccurate answer they were more likely to change their memory report, and this also occurred for low confident initial answers. This would occur as participants seek additional information to supplement an incomplete or weak memory, and disregard misinformation when they are able to compare their memory to this. Wright and Villalba (2012) showed a similar pattern of findings to the current study, despite using a methodology that presented misinformation to participants on an item-by-item basis immediately after their initial report, and allowed them to change their subsequent memory report.

Remember, know, and guess judgments are related to conforming answers, showing that memory characteristics play a role in whether the participant reported a conforming answer. Initial remember judgments were least likely to become conforming answers, although this was not significantly different to know judgments. Guess judgments were the most likely to become conforming answers.

When able to recall episodic detail for the initial memory, participants were able to compare a misinformation item with their memory and reject the item. When the initial memory did not have these details there was little to compare the new information to, which may then result in the participant believing that the new item was true, not noticing that there was a difference between items, or being able to recall the new item with more detail than the old item. A know judgment (a familiar initial memory) would also contrast

with any misinformation, with the new item being less familiar than the initial memory item.

When participants had an initial accurate or confident memory, or remembered the item with episodic details or as familiar, they may either not attend to misinformation for those items or they may reject the misinformation as inaccurate. In contrast, participants who were inaccurate, had low confidence and had guessed the detail may attend to post-event information items to supplement their memories. If they were unaware that the information provided may be inaccurate they may assume that the new information was more likely to be accurate for details they were uncertain about.

Misinformation is the usual focus of misinformation effect studies, however of additional interest was the effect of correct post-event information on memory. Conforming answers could only be reported to correct post-event information when the initial answer was inaccurate, as the participant was unable to change their answer to a conforming one when the information was the same as their memory reported. As initial accuracy in the current study was very high, this reduced the number of cases where correct post-event information was able to cause a conforming answer, thereby limiting the effect of correct post-event information. Despite this, it is interesting that participants changed their answer to one that was correct.

Although using a different methodology, Rush and Clark (2014) highlight the importance of using correct post-event information in a misinformation paradigm. Their findings showed that correct post-event information had a larger effect on memory compared with misinformation. Although not supported by the current results, it is probable that the effect of correct post-event information in the current study was limited by the lack of inaccurate initial answers. These were the only items to which conforming answers could occur for correct information, therefore increasing the initially inaccurate

answers would allow the full effect of correct post-event information to be shown. Further research needs to be conducted to examine the effects of correct post-event information when the initial memory is known, and initial accuracy is low, so that conforming answers can occur for these items.

The results of the current study may be due to floor effects and not a true indication of the direction of results. Overall conforming answers were below ten percent, and for some items did not occur at all. It is important in future studies that this overall percentage of conforming answers is increased so that the trends within the data can be clearly defined.

Memory Characteristics Measures

The final confidence of a participants answer was affected by the conformity status and accuracy of that answer. Accurate non-conforming items were reported with the highest confidence, however non-conforming answers resulted in a smaller increase in confidence compared with conforming answers. Although conforming answers resulted in a greater increase in confidence, participants were still less confident that these items were accurate than for non-conforming answers. All inaccurate and conforming answers resulted in similar final confidence, showing no discrimination in confidence between the sources of the inaccuracy (an initial inaccuracy vs. a conforming answer).

The conformity status and accuracy of the final items also affected the remember, know, and guess judgments. Accurate non-conforming answers were given with more remember, fewer know, and no difference in guess judgments compared with accurate conforming answers. There were no significant differences in the judgments between inaccurate conforming and non-conforming answers. When reporting an accurate non-conforming answer the participant retrieved the item episodic detail more often than for an accurate conforming answer, however the conforming answer was not guessed, instead

the participant felt that it was familiar. This could indicate that the participant has a memory trace of the item, which caused the item to be familiar to them. This was supported by the lack of difference between inaccurate conforming and non-conforming answers, where participants did not find the misinformation more familiar than an inaccurate answer.

The final remember, know, and guess judgments demonstrated that these are useful in understanding the experience of retrieving accurate and inaccurate, conforming and non-conforming answers. Despite the problems with these measures, as discussed previously, there is an indication that these could help with understanding the final memory report. Using separate measures of both recollection and familiarity (the remember and know judgments, respectively), differences in the retrieval experiences of conforming and non-conforming answers may become clearer. This is an area that needs to be researched further.

Next Study

The findings of the current study showed that participants were highly accurate and confident, and reported few conforming answers. The film used in the current study was short and uncomplicated, with each item clearly focused on, allowing for high levels of attention to most items. This did not allow for natural variations in attention during a complex occurrence. Future research should be conducted using longer, more complex films, to allow for increased variation between different items.

A problem with using a film such as the Tuckey and Brewer (2003) film used in the current study was the choice and lack of counterbalancing of the items. Specific atypical items were included in the films, meaning that correct post-event information and contradictory misinformation alternates could be used. Added items were used for items that were not included in the film. However, because only one version of these

items exist there is no way to counterbalance items across either schema or post-event information type. As we were unable to control for the nine different items, some of the reported effects may be caused or enhanced by imbalances in those items, rather than the actual variables we were aiming to test.

Future studies will need to be conducted using specifically made films for a schematic misinformation study. This will allow for counterbalancing of items, as versions can be created with typical and atypical options of a single item. These items can then also be used as the post-event information to allow for counterbalancing of the items as post-event information and in the film. A more complex event would reduce accuracy and confidence, and increase conforming answers. This will then allow for a greater investigation into the effect of schemas, whilst reducing some issues associated with the current study and the literature.

Chapter 3

Development Of A Film For Use In Misinformation Studies With Schema Relevant Items

The current pilot tests will be used in the formation of a stimuli set specifically created for the purposes of a schematic misinformation study. The films that were created show a schematic event that includes typical and atypical items. Several versions of the films have been made so that each item can be counterbalanced across both schema and post-event information.

Stimuli Used In The Current Study

To some extent, the use of schematic information within the misinformation paradigm has been limited by the stimulus events used. The study conducted by Maras and Bowler (2011) used slides taken from the film created by Tuckey and Brewer (2003). The film was not created for the purpose of a misinformation study, and using schematic misinformation items from the film resulted in few conforming answers in Study 1. It is likely that Maras and Bowler's (2011) strategy of using slides may have resulted in a greater frequency of conforming answers compared to that found in Study 1 because actions are not as evident and attention may not be drawn to these items as readily as during a film. Nevertheless, using a film is desirable as it provides a more naturalistic way in which an event is usually encountered.

Using films created for non-schematic misinformation studies or studies into the influence of schemas without misinformation creates the further problem of selecting items to vary for the misinformation. It is likely that a film created for the purposes of a misinformation study will not have systematically varied schema-typical and atypical items. Choosing atypical items from the environment may be possible but it is unlikely

that schema-atypical action items will have been included in the original film. Using a film with schematic items created for purposes other than a misinformation study leaves us with the problem of selecting critical items and misinformation. The schema of the post-event information is just as critical as the schema of the film item and when the items are not counterbalanced it is difficult to determine whether it is the specific item rather than the schema that is affecting the memory report.

Roediger et al. (2001) used slides of common household scenes which were then also used by Huff et al. (2013), both utilized for the purpose of social contagion studies. Common household scenes do not include atypical items therefore the misinformation items used were all added (i.e., were not present in the scene). Although this is one way of using pre-made films or slides in a misinformation study it does not give us an understanding of how contradictory misinformation or correct post-event information affect the memory for schema-atypical items. Furthermore, when using atypical misinformation items for an event that did not include any atypical items or actions, these atypical items may be more noticeable and less believable, which could alter the effects of the misinformation.

Due to the problems outlined above, a new stimulus set was created specifically for the current study. Several versions of the same film were created with typical and atypical variations on the same items. That is, for each critical item both typical and atypical versions of the scene were created where the critical item is the only variation. Each scene was filmed with two typical and two atypical versions, and these items were also used as post-event information. This ensures that, for all of the critical items, each variation is used as both a film item (and correct post-event information) and as contradictory misinformation.

The aim of the first pilot test was to select several critical scenes where an action

or item can be systematically varied across several versions of the scene. The second pilot test was used to check that the items were viewed with the same schema as intended, and to determine that the accuracy rates and confidence levels of each item within the critical scenes were not subject to ceiling or floor effects.

Pilot 1

The current pilot study was conducted to assess scene and item typicality, for items that could be used in creating a film of a house break-in. The aim was to choose several critical scenes where one item or action would be systematically varied between different versions of that scene. The questionnaire included open ended scenarios with a list of possible item alternates below. Items were ranked as expected or unexpected on a Likert scale. Expectant items are typical, whilst unexpected items are atypical (Stangor & McMillan, 1992).

Method

Participants. Eighteen participants from the community completed the pilot test questionnaire.

Materials. The pilot test was split into two sections; one asking about the appearance and actions of the robbers and the other about the environment of the elderly lady's house (see Appendix 4). Each section started with a short (34 or 47) word statement about the event and instructions on how to complete each question. Each section consisted of 7 questions which started with a statement of the action, appearance, or environment, and was left open ended with a list of possible occurrences. For example, "The getaway driver calls the robbers to tell them that someone is watching. The robber replies with…" which was followed with a list of 9 possible replies that the robber could give the driver. Participants were asked to rate each question on a 5-point Likert scale, with "Very Expected" as one, "Very Unexpected" as five, and "Neither Expected or Unexpected" as three. The questionnaire is given in Appendix 4.

Procedure. Participants were told that their answers would be analyzed to decide which questions and which items from those questions would be made into a short film. They were also told that it was important to give the best answer they could to each

question as the film would be used for research and it was essential to have a range of different expectancy items in the films. Participants were then given the questionnaire to complete.

Results And Discussion

Descriptive statistics are reported in Appendix 5 for the six chosen items to the 12 chosen questions. Schema-typical items were considered those with a mean of above 3, and schema-atypical items those with a mean below 3. For each question four items with the two highest and two lowest means were taken, which gave us schema-typical items with means between 1.00 and 2.22, and schema-atypical items with means between 3.83 and 5.00. As a rating of 3 was neither expected or unexpected, a third category of schema-neutral items was created. These items had means close to 3, which fell between 2.23 and 3.82; the outside values for typical and atypical items. These items were not used in the subsequent studies.

From the questions, five robbery and five house scenes were selected for the film as they had the best fit of schematic items. In addition, two house scenes were chosen as schema-irrelevant items. Irrelevant items are those that are neither atypical or typical; they are those items which are related to the schema but are not a part of the schema. They are therefore the items in a schematic environment that are neither expected or unexpected. Therefore, the two scenes that had all options rated as neutral were classified as schema irrelevant scenes and items. Four items from each of the schema-irrelevant questions were chosen.

One question (color of the getaway driver's jacket) did not yield enough items in the typical and atypical categories as, unfortunately, there were not enough options in the questionnaire. Extra options were chosen by the researcher, which were similar to the items given. These two extra options are given in Appendix 5 and are shown without

means and standard deviations from this pilot test. A third option was included during filming but had to be removed after no discernible difference was found between it and another option (the new option was grey but it looked the same as the black).

Description of the Film

The film opened with a blue car driving up to a suburban house, and stopping out the front. Three men get out of the car and move to the front of the car, where one sits down on the bonnet. They are discussing what they are about to do, with the obvious intention of breaking into the house. This is one of the varied scenes, where the driver of the car is wearing a jacket, which varies color depending on which version the participants view.

Two of the men walk to the front of the house, and you see a wide view of the garden and façade. There is a neat lawn, some shrubs, a letterbox, and an item sitting near the letterbox which varies between scenes. After ringing the bell and trying to door handle, the men walk around the side of the house trying the windows as they go. When they get to the back door they have a discussion about how they are going to get it open. Behind them is a clothesline, on which is hanging one garment only which varies between scenes.

The two men move back to an open toolbox they had passed that was sitting on a table. They go through the toolbox and choose an item, whilst discussing what would be useful in getting the door open. You do not see what the man selects. They then move back to the door and try to force it open with the tool, with the tool varying between scenes. This is a close-up of the tool and the robber.

The robber then breaks through the door and the two walk into the house. They separate with each of the men walking down a corridor in opposite directions. One robber is then shown in a bedroom looking around through a wardrobe and drawers. He picks up

a bag and starts putting things in it. He spends some time going through other items, and then rummages through some draws. One of these he takes out of the cabinet and tips on the bed. The items in the draw vary between scenes.

Once he has gone through the wardrobe and drawers near the bed, he moves to the dressing table. He opens some drawers here and takes a wallet, which he puts in the bag. He then picks up a box of tissues, next to which is an item which varies between scenes.

The other robber is shown going through the lounge. He goes to a cabinet and starts looking inside it. He then starts moving around the room, stopping to pick up a laptop that is sitting on a coffee table. Next to the laptop is an item that varies between scenes.

The first robber goes into a bathroom. Next to the basin is an item that varies between scenes. He looks through the cupboards but doesn't take anything.

The second robber is shown in a living room. He shouts to the other man to come here. He takes the DVD player from the TV cabinet and puts it in a bag. There is a close up of a clock that is hanging on the wall.

The first robber is in the kitchen, going through the cupboards haphazardly. On the kitchen bench is a bowl with several items in it. The robber takes one of these items, which varies between scenes.

Both men then walk into a storage room. They start going through cupboards and other items which are stacked around the room. They start chatting about what they should take, and one grabs some bottles from a wine rack.

They both go into a second bedroom, which has a chair in the corner with an item on it that varies between scenes. One robber takes a bottle of perfume from a table and smells it. The other robber picks up a crystal bottle and puts it in his bag.

As both robbers move to go into another room, one of their phone rings. It cuts to the driver who is sitting in his car, who tells them they need to leave. The robber on the phone answers, with the answer varying between scenes.

Both robbers walk out of the front door, next to which is an item that varies between scenes. They walk to the car, get in, and drive away.

The written narrative is a more detailed reflection of the film, as given in Appendix 6 with each of the items that vary between scenes.

Pilot 2

From the items in pilot test one, six versions of each scene were created and were strung together with several non-varied scenes into six versions of the films. Each film consisted of 12 varied scenes: Two schema-irrelevant scenes, five schema-typical, and five schema-atypical scenes. Each version of the film showed each scene once only, with each film shown in the same order. The difference between the films was which version of the scene was shown (e.g. schema-typical, atypical, nothing, or neutral).

The second pilot study was run to determine what schema the items were rated after being shown in the film, as the first pilot only tested participant's opinions on their own imagined scenes. A further aim of the study was to examine accuracy rates and confidence levels associated with each of the items, as exploratory analyses before using each item for a main study.

The attention paid to specific items is related not only to the schema of the item, but whether the item is central or peripheral to the event taking place. In the current study centrality will be defined by the Loftus (1979) definition regarding actions and appearance versus background details. Once the categorization of central and peripheral items has taken place, accuracy and confidence will be assessed as central items should be reported more accurately and with higher confidence than peripheral items (Loftus, 1979).

Another aim of the current pilot test was to categorize the items for each question as high or low schematic. High schematic items are those that are rated as extremely typical or atypical, and low schematic items are those that are closer to neutral. This categorization more closely aligns with studies where high and low expectancy items are used, with high typical items being similar to high expectancy, and low typical being similar to low expectancy.

This categorization allows a comparison of typical versus atypical items and high versus low items for each schema typicality. The categorization was based on a comparison of the expectancy means for each item within a question, with items that have the highest and lowest means being categorized as highly schematic. The item with the lowest mean was categorized as highly typical and the item with the highest mean was categorized as highly atypical. Neutral and "nothing" versions were not included in this categorization.

Due to the aim of categorizing items as high or low schematic, it was decided to use a 7-point Likert scale in the second pilot study, compared with the 5-point scale used in the first. The 7-point scale is more sensitive to variation, which was considered important for this categorization. An additional benefit of using this scale is to more accurately determine if an item is neutral, as the typical and atypical items should be pushed further to the ends of the scale leaving room for good categorization of these neutral items.

Method

Participants. Participants were 49 first-year university students (34 Female, 11 Male, 4 not reported) from Flinders University in Adelaide, Australia. The mean age was 20.07 years (*SD* = 3.71). Participants were given course credit for their time.

Materials. Six versions of the film were created, each with 12 varied scenes. The scenes were those chosen from pilot test one. Ten of the scenes had two schema-typical, two schema-atypical, one schema-neutral, and one nothing scene, with each film showing only one of these scenes. The nothing scene occurred in the same way as the other scenes, but the critical item was left out. For example, when the getaway driver calls the robber, the robber does not say anything. The remaining two scenes had four versions which were all schema-irrelevant or "nothing" scenes.

A cued-recall questionnaire was used which consisted of 13 questions: one for each varied scene and one for a schema check. The schema check question asked about the owner of the house to ensure that participants had realized that it was an elderly lady's house, which was central to the environment schema. For each question participants were asked to give an answer, a confidence rating from 0 to 100%, and an expectancy rating. The expectancy rating was on a 7-point Likert scale, with "Extremely Expected" as one end point, "Extremely Unexpected" as the other end point, and "Neither Expected or Unexpected" as the central point.

Procedure. Participants took part in this pilot test as the second study in an hour long session. Participants were told at the start of the session and between studies that the studies were separate and in no way related to each other. Participants watched the researcher open one of the six film versions on a large TV screen. They were asked to attend to the film as their memory would be tested once it had finished. At the end of the film the screen was turned off and participants were given a questionnaire that was marked in the footer with the film version they had viewed. Participants were instructed to complete the questionnaire as accurately as possible, with no time limit.

Results

Means and standard deviations were calculated for accurate answers only. These are the items that we can be sure have the correct schema and expectancy, as inaccurate answer are not measureable in this way. Appendix 5 gives the descriptive statistics for the accurate answers with the means and standard deviations from Pilot 1. It must be noted that some differences in expectancy means between pilots 1 and 2 were attributed to the different scales used in each study. the first pilot study used a 5-point scale, whereas 7-point scales were used in the second pilot study.

The typicality of each item is given in Appendix 5, with items categorized as

highly or moderately typical and atypical within each question. For questions where the expectancy ratings were the same for multiple items or no accurate answers were given, the rank was assigned by ranking the expectancy means from the first pilot study.

Table 10

Proportion of Accurate Answers and Centrality by Question (95% CI)

Question Number	Question	Accuracy	Centrality
1	**Item Sitting Next to the Letterbox**	.25 (.14, .34)	Peripheral
2	**Color of the Driver's Jacket**	.69 (.60, .78)	Central
3	**Item Hanging on Clothesline**	.45 (.38, .52)	Peripheral
4	**Tool Used to Break In**	.87 (.80, .93)	Central
5	**Tip Out of Drawer**	.92 (.87, .99)	Central
6	**Steal From Dressing Table**	.27 (.19, .35)	Peripheral
7	**Lace Mat on Coffee Table**	.34 (.28, .40)	Peripheral
8	**Sitting Next to Basin**	.17 (.09, .25)	Peripheral
9	**Stolen from Bowl**	.79 (.70, .89)	Central
10	**Chair in Corner**	.24 (.15, .32)	Peripheral
11	**Robber's Reply to Phone Call**	.69 (.59, .78)	Central
12	**Propped in Corner**	.15 (.06, .24)	Peripheral

There was a significant effect of accuracy on expectancy ratings ($\chi^2(1) = 39.83$, $p < .001$), with accurate answers ($M = 4.68$, $SD = 1.83$, *95% CI* = 4.43, 4.93) having higher expectancy ratings compared with inaccurate answers ($M = 3.75$, $SD = 1.47$, *95% CI* = 3.59, 4.00; $b = 0.96$, $SE_b = 0.15$, $p < .001$). There was also a significant effect of accuracy on confidence ($\chi^2(1) = 219.62$, $p < .001$), with accurate answers ($M = 81.25$, $SD = 27.15$, *95% CI* = 76.55, 85.95) having higher confidence ratings compared with inaccurate

answers (M = 32.16, SD = 32.40, *95% CI* = 27.40, 36.92; b = 41.12, SE_b = 2.61, $p < .001$).

The proportion of accurate answers for each question are given in Table 10 with their centrality. We can see that there is a distinctive split in accuracy rates with questions 2, 4, 5, 9, and 11 having higher accuracy compared with the other questions. These items are those classified as central (rather than peripheral), also shown in Table 10. The effect of centrality on accuracy was significant ($\chi^2(1) = 11.96$, $p < .001$), with central items (.70, *95% CI* = .65, .76) being reported with a higher proportion of accurate answers compared with peripheral items (.27, *95% CI* = .20, .34; b = -0.44, SE_b = 0.10, $p < .001$).

Discussion

Accuracy and confidence were shown to be strongly related, with participants reporting accurate items more confidently than inaccurate items. When their memory is tested immediately after viewing the event, such as in the current study, confidence measures may be one means of measuring memory strength.

The centrality of items was determined by a theoretical definition that differentiated between the actions and appearance of the robbers (central items) and other environmental items (peripheral). Once these items had been categorized, accuracy and confidence for central versus peripheral items were assessed. Central items were given with greater accuracy and higher confidence compared with peripheral items, as expected.

A comparison of results from pilots 1 and 2 show that the majority of items were rated with the same schema from both tests, with variation in scores due to the different scales used.

The item *"tipped out of drawer"* was removed as a critical scene from the films due to the high means for all items. The action of the robber tipping out a drawer onto the bed may be schema-atypical therefore all of the items being tipped out of the drawer are tainted with the unexpected nature of this item.

Chapter 4

Study 2: The Use Of Schematic Items In The Misinformation Paradigm Using Specially Created Stimuli

Schema typical and atypical items were used in the current study, however unlike in Study 1, irrelevant items were not. This decision was adopted for methodological reasons so that the content of the item could be separated from the schema type. That is, typical and atypical items can occur for the same critical items and can therefore be counterbalanced as the event item and misinformation. Irrelevant items cannot occur for the same critical items and for irrelevant film items the post-event information must also be irrelevant. Schema typical and atypical items were the main focus of this thesis and due to this issue, irrelevant items were no longer used.

Centrality refers to whether the item is central or peripheral to the actions and items within an event. Central items are those that pertain to the actions and appearance of key characters such as the robbers in the robbery film used in the current study, whilst peripheral items are background and environmental items. For example, the tool used to break in through a door by the robber is a central item, whilst an item sitting on the basin in the bathroom is a peripheral item. Central items are attended to more highly than peripheral items, as central items are important to the event. Central and peripheral items can be schema-relevant or irrelevant. The centrality of schematic items has not been considered in a misinformation study, although centrality (e.g. Luna & Migueles, 2009) and schema have been examined separately.

The effect of centrality on initial accuracy is tested to confirm the results of Pilot 2, where centrality was defined based on theory but confirmed by accuracy measures. Hypothesis 1 is therefore testing the previous results rather than the theory that centrality affects accuracy. The relationship with schematic items is, however, of interest in this

current work.

The centrality and schema of the item both affect attention during the film, and may therefore interact in their effects on the initial memory measures. Atypical items may be attended to more than typical items during the film as these are surprising and contradict the schematic expectation. Central items are also highly attended to as they are important to the event, whilst peripheral items are less attended to. The centrality may affect the attention given to the schematic items, with the schema affecting initial accuracy differently for central or peripheral items. Therefore, the effects of both schema and centrality on the initial memory measures were explored.

The hypotheses about the effects of the film schema and centrality on the initial memory are:

1. The centrality of the film item will affect initial accuracy, such that central items will be reported with a higher proportion of accurate answers compared with peripheral items.
2. The schema of the film item will affect initial accuracy with typical items reported with a lower proportion of accurate answers compared with atypical items.

Schemas On Conforming Answers

In Study 1 there was no significant effect of either the film or post-event information schemas on conforming answers, and they also did not significantly interact. Due to possible problems with the stimuli, those results may not have been a true indication of the effects of schemas on conforming answers. Using stimuli created for the specific purpose of a schematic misinformation study where we can counterbalance items as both the film and post-event information should give us a greater understanding of how schematic items work in a misinformation context.

The film and post-event information schemas were expected to interact in their

effects on conforming answers, as post-event information presented to a film item of the same schema will be more believable and less likely to be rejected. Typical post-event information presented to a typical film item, and atypical post-event information presented to an atypical film item, would result in a higher proportion of conforming answers compared with typical post-event information presented to an atypical film item and atypical post-event information presented to a typical film item.

The expectancy level of schematic post-event information was also examined in the current study. As described in Chapter 1 the definitions of schematic items have varied across the schema misinformation literature. The stimuli used in the current study had four schematic items for each critical item, two typical and two atypical. Each of these items has also been rated as high schematic or low schematic, and this interacts with the post-event information schema to produce high and low typical and atypical items. This will be referred to as the schema "height". Using both definitions of the schema allowed us to compare results with more of the literature, and aided in determining if this was a factor affecting the differing findings reported in the literature.

The hypotheses regarding the effects of the schematic misinformation and the film schema on conforming answers are:

3. The film and post-event information schemas will interact in their effect on conforming answers. Typical post-event information presented to a typical film item, and atypical post-event information presented to an atypical film item will result in higher proportions of conforming answers compared with typical post-event information presented to an atypical film item, and atypical post-event information to a typical film item.
4. The height of the post-event information schema will affect conforming answers, with low typical items resulting in the largest proportion of conforming answers,

compared with high typical and atypical items, and low atypical items.

Centrality On Conforming Answers

The centrality of an item was the same throughout the whole study, and was expected to affect conforming answers as well as the initial memory. The centrality was tied to the question rather than the level of the item, unlike the schema. Therefore central film items are also central post-event information items. As discussed previously, central items were expected to be highly attended during the film but this would also occur during the narrative, whilst peripheral items would be less attended during both phases. Fewer conforming answers were expected for central items, as participants would have a stronger initial memory of these items and therefore be more likely to reject the post-event information for these items. Peripheral items would have weaker initial memories and would therefore be more susceptible to the effects of the post-event information. This prediction is in line with previous research examining centrality in the misinformation effect, where peripheral items have been found to result in a greater misinformation effect than central items (e.g. Luna & Migueles, 2009).

The hypothesis of the effect of centrality on conforming answers is:

5. Conforming answers will be affected by the centrality of the item, with central items resulting in a lower proportion of conforming answers compared with peripheral items.

Initial Memory

Accurate and highly confident initial items were expected to be reported with fewer conforming answers than inaccurate and low confidence initial items. This is because the post-event information would more strongly contradict the initial memory if it is accurate and strong which would lead to the item being more likely to be rejected and not reported on the final memory test. For items that the participant had a weak and

inaccurate memory, the post-event information may be accepted as correct and therefore be reported. Differences between post-event information type, specifically between misinformation and correct post-event information is discussed in terms of initial accuracy below.

The hypotheses regarding the effects of initial accuracy and confidence on conforming answers are:

6. Initial accuracy will affect conforming answers with accurate initial items resulting in a lower proportion of conforming answers compared with inaccurate initial items.
7. Initial confidence will be related to conforming answers, with items that go on to become conforming answers reported with lower mean initial confidence compared with items that do not become conforming answers.

Post-Event Information Types

The current study examined the effects of contradictory misinformation and correct post-event information on participants memory. Study 1 showed that conforming answers did occur for correct post-event information, however the initial memory had to be inaccurate for this to occur. By reducing the overall initial accuracy in the current study this was likely to increase the number of items to which conforming answers occurred to correct post-event information.

Added misinformation was not be used in the current study, with the focus instead on the comparison between the contradictory misinformation and correct post-event information. There were two reasons for the omission of added misinformation. First, added misinformation occurs when the item did not exist in the film but misinformation is presented for this item, which contrasts with both contradictory misinformation and correct post-event information, where a schematic item was shown in the film and post-

event information is given. Given this thesis was trying to determine how both the film and post-event information schemas worked in a misinformation paradigm, this was difficult to address with added misinformation. Second, when using an initial memory test, participants were reporting an answer about the missing film items to which added misinformation will be presented, therefore the information either contradicted an inaccurate answer (i.e. a report that something occurred), but also technically contradicted an accurate answer that nothing occurred. In this sense, added misinformation represented contradictory misinformation but of differing types depending on the initial report.

Conforming answers could occur to misinformation when the initial memory is accurate or inaccurate. For correct post-event information the initial memory must have been inaccurate. In the current study a new variable was created to take the initial accuracy of an item into account when examining the effect of the post-event information type on conforming answers. The variable of post-event information type and initial accuracy had three levels: an initially inaccurate item to which correct post-event information is presented, an initially inaccurate item to which misinformation was presented, and an initially accurate item to which misinformation was presented. As conforming answers cannot occur for initially accurate items to which correct post-event information was presented, these items were excluded from analyses on conforming answers.

When the initial memory is inaccurate, both correct post-event information and misinformation led to conforming answers. Only one known study has examined the effect of correct information on conforming answers (Rush & Clark, 2014). They found that correct post-event information resulted in more conforming answers than misinformation. In their study, however, the initial memory of the participants was tested using free-recall. Therefore, for items not recalled, there is no way of knowing if the

participant could report the item if asked. Due to this methodological difference with the current study where we will know the initial memory report for all items examined, a direct comparison cannot be made. The analyses examining this effect are therefore exploratory, since the initial accuracy may reduce this effect or may not play a role.

The hypothesis about the effect of the post-event information type and initial accuracy on conforming answers is:

8. The post-event information type and initial accuracy are predicted to affect conforming answers. Accurate initial items to which misinformation is presented will result in the lowest proportion of conforming answers, however the comparison between correct post-event information and misinformation presented to an inaccurate initial item is exploratory.

Confidence

Confidence ratings were used in both the initial and final memory tests. This provided three measures of confidence: initial confidence, final confidence, and change in confidence. Participants were asked to give a confidence rating for each question: reflecting how confident they were that the given answer was accurate. In contrast to Study 1, where participants were asked to circle an answer on a scale of 0 to 100% in 10% increments, participants in the current study were asked to write a number between 0 and 100% for each item. This change occurred for two reasons. Firstly, in the current study recollection and familiarity judgments which were also given on a scale, the purpose being to dissuade participants from simply circling three answers in line with each other, or to base their confidence or recollection and familiarity ratings off each other without considering these properly. Secondly, by writing out their confidence rating rather than circling a specific value, participants may have been more likely to be less reliant on the end points which are obvious and easy to report, and may give a wider range

of answers.

Furthermore, it was predicted that the confidence with which a participant reported each item would be related to whether that item was accurate. Accurate items would be easier to recall and may be more vivid than inaccurate items, which would then be translated into a high confidence rating for that item. This relationship should occur for both the initial and final measures, however final confidence would also be affected by whether the item is a conforming answer or not. The final accuracy of an item and the conformity status of that item would interact in their effect on final confidence. Items that were accurate and non-conforming should be given with higher mean confidence compared with conforming and inaccurate items, as these are items that the participants had maintained accurately from the initial to the final memory test.

The change in confidence gave a more in-depth understanding of how items had changed from the initial to final memory tests, and which factors influenced this. Conformity status should affect the change in confidence, as conforming answers would be reported with lower mean initial confidence compared with non-conforming items but reporting an item from a specific source in the study (the narrative) would result in higher final confidence. It was likely that the type of post-event information presented to participants would also affect the change in confidence, with misinformation resulting in a decrease in confidence for the items it is presented to and correct post-event information resulting in an increase.

The schema and centrality of items would affect the initial confidence of those items due to differences in attention and memory retrieval, and whether the participant thought the answers are likely to be correct. Atypical film items are highly attended to and are easily retrieved from the memory, therefore would result in higher initial confidence compared with typical items. Similarly, central film items would result in

higher initial confidence than peripheral items. These effects may be due primarily to the accuracy of the item, therefore analyses needed to be conducted both with and without controlling for initial accuracy, to determine whether there was an effect independent of accuracy.

The post-event information schema would affect final confidence in a similar way to the effect of the film schema on initial confidence, with atypical items resulting in higher confidence than typical items. This may be qualified by an interaction with the film schema, as post-event information items presented to a similar film schema may result in higher final confidence due to no difference between the schemas of the items.

The hypotheses regarding confidence (initial, final, and change in) are:

9. There will be a relationship between accuracy and confidence for both the initial and final measures, with accurate answers being reported with higher mean confidence compared with inaccurate answers.
10. Final accuracy and conformity status are predicted to interact in their effects on final confidence. Accurate non-conforming answers are expected to be reported with high mean final confidence, with accurate conforming, inaccurate conforming, and inaccurate non-conforming answers all reported with similar low mean final confidence.
11. It is predicted that the type of post-event information presented to the participant will affect the final confidence of that answer, with correct post-event information resulting in higher mean final confidence compared with misinformation.

Recollection And Familiarity

Separate scales for recollection and familiarity were used in the current study to replace the remember, know, and guess judgments from Study 1. Remember, know, and guess judgments cannot take into account occasions where the item was both recollected

and familiar. Participants could only report one judgment, therefore if they believed that an item met the requirements for multiple options they could not select this. Changing to two scales, one for recollection and one for familiarity means that participants have more variation in possible reported answers. The two scales used in the current study take guess judgments into account through the use of the two middle options on each scale "guess yes" and "guess no". Although participants are forced to report a recollection and familiarity judgment for each item, if they have guessed this item they are therefore able to use the guess options on each scale.

A high recollection judgment was given when the participants were able to recall distinct episodic details of the item, whilst a high familiarity judgment was given when the semantic memory system is used. Items can be retrieved from either the semantic or episodic memory systems, or through both. Due to this, there would be a relationship between the two judgments, but some differences would occur. Furthermore, different types of items would result in similar scores on both scales if they are both recollected and familiar, but will result in different scores if one system is predominantly used.

The schema forms part of the semantic memory system and when schema typical items are retrieved from the memory they would be retrieved wholly or partially from this system. In contrast atypical items may be encoded as a special case in the semantic memory system but would be more likely to be recalled from episodic memory. The film schema would therefore affect initial recollection with atypical items being reported with higher judgments than typical items reflecting this episodic detail, and with typical items reported with higher familiarity judgments than atypical items reflecting the semantic memory retrieval. The post-event information schema would affect the recollection and familiarity judgments, however this may be qualified by an interaction with the film schema. This was an exploratory analysis, as a matched schema (e.g. typical film and

post-event information) may affect the memory differently to a mismatched schema (e.g. typical film and atypical post-event information).

The centrality of items may affect the initial recollection and familiarity judgments, however this is also an exploratory analysis. Central items would be attended to more highly during the film and may be retrieved from the memory more easily than peripheral items, which would lead to higher recollection and familiarity judgments respectively. This however may only occur due to the relationship with accuracy, which was predicted to have its own effect on these measures. The effect of centrality on initial recollection and familiarity was examined with and without controlling for initial accuracy to determine what effect this plays.

The final recollection and familiarity measures gave information about the memory characteristics of accurately versus inaccurately recalled final answers, and conforming versus non-conforming answers. Similarly to the initial measures, there should be an effect of final accuracy on both recollection and familiarity as accurate items would be retrieved with episodic details from the episode and with familiarity as an item that was present in the stimuli. This may be qualified by an interaction with conformity status if conforming answers are different depending on whether they are accurate or not. For example, correct post-event information may be more familiar than misinformation resulting in differences in familiarity judgments for accurate (correct post-event information) to inaccurate (misinformation) conforming answers.

The accuracy of an item and the memory characteristics measures for the item should be related, as these all relate to the memory retrieval of the same item. That is, each of the accuracy, confidence, and recollection and familiarity measures should be intercorrelated. When examining the effects of the schemas, centrality, post-event information, and conforming answers on accuracy and the memory characteristics, this

intercorrelation was taken into account. Specifically, the accuracy of an item was controlled for when looking at the effects of confidence, and recollection and familiarity. Additionally, when considering the interpretation of the results the intercorrelation was taken into account.

The hypotheses regarding the recollection and familiarity ratings are:

12. The schema of the film item is predicted to affect the reported initial recollection and initial familiarity scores. For recollection, atypical items will be reported with a higher mean recollection score compared with typical items. Initial familiarity scores will, in contrast, be higher for typical compared with atypical film items.
13. The centrality of the item is predicted to affect both initial recollection and initial familiarity, with central items being reported with higher mean recollection and higher mean familiarity scores compared with peripheral items.
14. It is predicted that the conformity status of an item will affect the final recollection and final familiarity scores with which the item is reported. Final mean recollection scores will be higher for non-conforming compared with conforming answers. Final mean familiarity scores will be higher for conforming compared with non-conforming answers.

Stimuli used in the Current Study

The current study used stimuli created for the specific purpose of a schematic misinformation paradigm, as was discussed in Chapter 3. The films showed a house break-in that included typical and atypical items. Several versions of the films were made, with each item counterbalanced across both schema and post-event information types. Participants saw one version of the item and received either this item as correct post-event information, or an item from one of the other films as misinformation.

Initial and final cued-recall tests were used in the current study so that changes in

memory could be determined, and conforming answers could be accurately scored. Furthermore, it was possible to determine how the film items affected the initial memory, and how post-event information interacted with this to influence the final memory report.

Method

Participants

Students from Flinders University, South Australia were recruited for the study. The study included 53 participants (40 Female, 13 Male), with a mean age of 23.57 years (*SD* = 6.81). Participants were reimbursed $25 for their time.

Design

Participants were run either individually or in small groups. A partial random allocation procedure was used with sessions, rather than individuals, randomly allocated to one of four films, each depicting a house break-in. Within each film there were nine critical items that were either schema-typical or schema-atypical, with four or five of each per film. Of these items, four were central to the actions and appearance of the robbers, and five were peripheral including details in the background of the scenes. Table 11 details the centrality and schema of each item for each of the film versions.

Within each session, participants were randomly allocated to one of six narratives, so that, in total, there were 24 film and narrative combinations. The narratives contained correct post-event information and misinformation that was either schema-typical or atypical.

The independent variables were the centrality of the item (central vs. peripheral), the schema consistency of the film item (typical vs. atypical), the schema consistency of the post-event information (typical vs. atypical), and the post-event information type (correct vs. misinformation). The dependent variables were conforming answers, accuracy, confidence, and the recollection and familiarity judgments. The dependent variables (except conforming answers) were measured twice: in an initial (before post-event information) and a final memory test (after post-event information). Conforming answers were coded based on comparisons between initial and final answers.

Materials

Films. There were four versions of the film, each with variations on several items within the film. The film depicted a house break-in by two men and a getaway driver, with the two men forcing a door open, going through the house, and finally running out to the car and driving away. Each version of the film runs for approximately 5 minutes and 50 seconds. The critical schema items are shown in Table 11.

Table 11

Critical Item, Centrality, and Film Schema, by Film Version

Critical Item	Centrality	Film A	Film B	Film C	Film D
Getaway drivers jacket	Central	Dark Grey *Typical*	Yellow *Atypical*	Brown Striped *Typical*	Red *Atypical*
Item hanging on the clothesline	Peripheral	Red Jeans *Atypical*	Towels *Typical*	Mini-Skirt *Atypical*	Long Skirt *Typical*
Tool used to break the door lock	Central	Paintbrush *Atypical*	Screwdriver *Typical*	Tape Measure *Atypical*	Crowbar *Typical*
Item stolen from the dressing table	Central	Jewelry Box *Typical*	Tissue Box *Atypical*	Gold Clock *Typical*	Religious Picture *Atypical*
Item sitting next on the lace mat	Peripheral	Vase of Flowers *Typical*	Gnome *Atypical*	Pot Plant *Typical*	Blender *Atypical*
Item sitting next to the bathroom basin	Peripheral	Jar of Coffee *Atypical*	Bar of Soap *Typical*	Pens in Holder *Atypical*	Face Cream *Typical*
Item stolen from the bowl in the kitchen	Central	Apple *Atypical*	Watch *Typical*	Nail Polish *Atypical*	iPod *Typical*
Robber's reply to the getaway driver's phone call	Central	Come on, let's go *Typical*	It's a nice day *Atypical*	Yep, got it *Typical*	Don't worry, who cares *Atypical*
Item propped up in the corner by the front door	Peripheral	PVC Pipe *Atypical*	Walking Stick *Typical*	Cricket Bat *Atypical*	Umbrella *Typical*

Cued-recall memory tests. The initial and final memory tests included 26 questions presented in the same order in both tests, shown in Appendix 7. From the 26 questions, nine asked about the critical items, one was a check of the elderly lady's house schema, and the remaining were filler questions about the robbers and items within the house. The check of the elderly lady's house schema was introduced to ensure that participants were aware of the setting for the film, and therefore that their schema was activated. This was simply a question asking about the setting for the film, and was answered correctly by all participants.

The instructions for the memory tests differed slightly such that the instructions on the final test emphasized the requirement to answer about the film (and not the narrative). The instructions for the final questionnaire are given in Appendix 8.

The initial questionnaire included questions about the age and gender of the participant. Additionally, participants were asked to give a confidence rating of between 0% and 100% for each answer (excluding demographics), by reporting their confidence under the question.

Recollection and Familiarity Ratings. Modified 6 point scales, similar to those used by Higham and Vokey (2004), were used to measure recollection and familiarity separately. An example of the recollection scale is given below. The familiarity scale differed in the title and the description "you know the item was in the FILM because it feels familiar". Participants were given an instruction booklet that described the recollection and familiarity scales and how to use them. The instruction booklet also contained a self-test and answers, to check if the participant was able to accurately apply the instructions.

Recollection					
(You recollect some specific details of this item from the FILM)					
1––––––––	**2**––––––––	**3**––––––––	**4**––––––––	**5**––––––––	**6**
Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

Narratives. Post-event information was presented through written narratives with 24 narratives in total, six for each version of the film. An example of the narrative is given in Appendix 6. In each narrative there were three or four correct post-event information items, and six or seven contradictory misinformation items. The contradictory items were a mix of the same or different schema from the original film item. The items could therefore be: typical or atypical correct post-event information with the same schema; or misinformation typical-typical, typical-atypical, atypical-typical, atypical-atypical. Each participant received a combination of all possible post-event information types and schemas.

The narratives were separated into 14 paragraphs, with each paragraph having no more than one critical item. The paragraphs were between 65 and 126 words each. Within the narrative were several questions about each paragraph to ensure that participants thoroughly read each section. These questions asked about the amount of detail and portrayed confidence in each paragraph, they did not ask for any content.

Maze task. A 5 minute timed maze task was used as a filler between the narrative and the final questionnaire. Participants were told that this was a logic task and to complete as many of the mazes as possible within the time limit. Five mazes of varying difficulties were used so that it would be difficult for the participants to complete the task within the time limit.

Procedure

Participants were run in groups of up to six members. They were seated together

in a room facing a large TV screen which displayed the words “House Robbery Film”. Participants were instructed to pay attention to the film as they would be tested on their memory for it, but to not take notes or make any noise including comments to other participants. After the film participants were given the questionnaire instructions and the recollection and familiarity instructions, and asked to go through these carefully at their own pace. Next participants completed the initial questionnaire and handed it back to the researcher, before reading through the narrative. Participants then undertook the 5 minute maze task, before completing the final questionnaire. They were then given a debriefing sheet and thanked for their time.

Scoring

Answer accuracy. The initial and final answers were coded as either accurate or inaccurate by comparing the answer with the film item. If the answer was substantially the same as the film item this was scored as accurate.

Conforming answers. The final answer was compared with the initial answer and the post-event information to determine if the answer was conforming. If the final answer was the same as the initial answer this was scored as a non-conforming answer. If the final answer substantially reflected the post-event information and was different to the initial answer the item was scored as a conforming answer. An example of a substantial reflection but not exact replication of the post-event information would be a participant changing their answer from “a yellow jacket” to “a dark jacket” when the post-event information was “a navy blue jacket”.

Modified type of post-event information measure. To explore the interaction between post-event information type and initial answer accuracy on conforming answers, a new variable was created. A summary of conforming and non-conforming items by post-event information type and initial accuracy is given in Table 12.

Although it seems obvious to just look at the 2 (post-event information type: correct information, contradictory misinformation) × 2 (initial answer accuracy: accurate, inaccurate) matrix, this is not sensible since it is difficult to interpret a correct final answer to correct post-event information after being initially accurate. This could be interpreted as either a conforming answer as the participant has reported the post-event information, or as a non-conforming answer as the individual has not changed their memory report. This new variable therefore had three levels: correct post-event information presented to an inaccurate initial answer; misinformation presented to an inaccurate initial answer; misinformation presented to an accurate initial answer. Correct post-event information presented to an initially accurate answer were treated as missing for analyses on conforming answers.

Table 12

Definitions of Conforming and Non-Conforming Answers by Post-Event Information Type and Initial Accuracy

Post-event information type	**Initial Accuracy**	
	Accurate	**Inaccurate**
Correct post-event information	Conform = NA Non-Conform = NA	Conform = report correct post-event information Non-Conform = same as initial answer (or not post-event information)
Misinformation	Conform = report misinformation Non-Conform = same as initial answer (or not misinformation)	Conform = report misinformation Non-Conform = same as initial answer (or not misinformation)

Results

The following results are separated into several sections. First we will look at the differences between items. Next the memory report prior to the presentation of the misinformation is examined; that is, the initial memory report. The misinformation effect is then investigated, including the effect of the initial memory on conforming answers. Next, initial, final, and change in confidence are considered. Lastly, the initial and final recollection and familiarity judgments will be examined.

Excluded Items

Nine critical questions were used across the four films and corresponding narratives. Questions were excluded on the basis of very high proportions of accurate answers and very high mean confidence across all versions of the item, as these items cannot be used to explain variance within other variables. Appendix 9 shows the proportion of accurate initial answers and mean initial confidence for all four versions of each question. The item of the tool used to break in was excluded from analyses due to the high proportions of accurate answers (100% for two schema conditions, and over 90% for the remaining two conditions) and high mean confidence (over 97% for three conditions and over 90% for the other condition). Overall accuracy was around 50% and mean confidence ranged from 60-70% for each film, once the above item was excluded.

Of the remaining eight questions, one condition of a question was reported with 100% accuracy and one condition within a question with 0% accuracy. One additional condition of a question was reported with estimated 100% confidence. For each of these conditions there was variance within the question across the other conditions, and therefore the items and questions were not removed.

Memory Report Prior To The Presentation Of The Post-Event Information

Film schema. The accuracy of initially reported items was affected by the schema

of the film item ($\chi^2(1) = 4.00$, $p = .05$). Shown in Table 13, typical items resulted in a lower proportion of accurate answers compared with atypical items ($b = 0.40$, $SE_b = 0.20$, $p = .04$), as expected.

Table 13

Proportion of Accurate Initial Items by Centrality and Film Schema (95% CI)

	Film Schema		
Centrality	**Typical**	**Atypical**	**Total**
Central	.61 (.39, .79)	.89 (.75, .92)	.75 (.58, .87)
Peripheral	.32 (.18, .46)	.20 (.06, .44)	.30 (.01, .20)
Total	.42 (.23, .63)	.52 (.37, .82)	

Centrality. The effect of centrality on initial accuracy was significant ($\chi^2(1) = 9.17$, $p = .002$). As seen in Table 13, central items resulted in a higher proportion of accurate answers compared with peripheral items ($b = -1.95$, $SE_b = 0.48$, $p < .001$), as predicted.

An exploratory analysis was conducted to determine if the centrality of the item interacted with the film schema in their effect on initial accuracy. The interaction was significant in the effect on initial accuracy ($\chi^2(1) = 16.57$, $p < .001$). Simple effects analyses were undertaken to compare the effect of the film schema on initial accuracy across central items and peripheral items separately. For peripheral items there was no significant difference between atypical and typical film items ($b = -0.21$, $SEb = 0.24$, $p = .39$). For central items, typical items resulted in lower initial accuracy compared with atypical items ($b = 1.60$, $SE_b = 0.39$, $p < .001$).

Initial accuracy and confidence. The relationship between initial accuracy and initial confidence was significant ($\chi^2(1) = 210.31$, $p < .001$). As expected, inaccurate answers ($M = 41.11$, $SD = 30.42$, 95% CI = 31.55, 58.37) were reported with lower mean

initial confidence levels than with accurate answers (M = 81.05, SD = 23.14, 95% CI = 72.16, 89.94); b = 39.94, SE_b = 2.47, p < .001.

The Misinformation Effect

The following analyses are reported both with and without controlling initial accuracy and confidence where appropriate, and are shown in Table 14. The subscript "adj" is reported wherever the statistic is adjusted by accuracy.

Initial accuracy and confidence. Initial accuracy significantly affected conforming answers. As predicted, inaccurate initial items resulted in a higher proportion of conforming answers (.28, 95% CI = .18, .41) compared with accurate initial items (.06, 95% CI = .03, .11).

Table 14

Initial Accuracy and Confidence, Film and Post-Event Information Schemas, Post-Event Information Type, and Centrality on Conforming Answers, With and Without Controlling Initial Accuracy and/or Confidence in the Model

Predictor	Variables Controlled	$\chi^2(1)$	*b (SE)*
Initial Accuracy	None	32.67, p < .001	-1.85 (0.35), p < .001
Initial Confidence	None	38.02, p < .001	-20.75 (3.46), p < .001
	Initial Accuracy	13.23, p < .001	-0.02 (0.01), p < .001
Initial Accuracy * Confidence	None	4.36, p = .04	A[4]: -18.43 (5.44), p < .001; I: -8.03 (3.78), p = .02

[4] A = Accurate and I = Inaccurate

Table 14 Continued

Predictor	Variables Controlled	$\chi^2(1)$	*b (SE)*
Initial Recollection	None	72.59, $p < .001$	-1.14 (0.18), $p < .001$
	Initial Accuracy	42.11, $p < .001$	-0.69 (0.16), $p < .001$
	Initial Confidence	34.88, $p < .001$	-0.23 (0.10), $p = .01$
	Both	28.99, $p < .001$	-0.19 (0.10), $p = .03$
Initial Familiarity	None	53.18, $p < .001$	-0.66 (0.20), $p < .001$
	Initial Accuracy	33.53, $p < .001$	-0.20 (0.18), $p = .14$
	Initial Confidence	35.19, $p < .001$	0.20 (0.13), $p = .06$
	Both	33.06, $p < .001$	0.22 (0.13), $p = .04$
Film Schema	None	2.61, $p = .11$	-0.41 (0.24), $p = .10$
	Initial Accuracy	1.40, $p = .24$	-0.32 (0.26), $p = .22$
	Initial Confidence	1.31, $p = .25$	-0.31 (0.26), $p = .24$
	Both	1.13, $p = .29$	-0.29 (0.27), $p = .27$
Post-Event Information Schema	None	5.56, $p = .02$	-0.63 (0.26), $p = .02$
	Initial Accuracy	5.00, $p = .03$	-0.64 (0.28), $p = .02$
	Initial Confidence	5.62, $p = .02$	-0.68 (0.28), $p = .02$
	Both	5.17, $p = .02$	-0.67 (0.29), $p = .02$
Film * Post-Event Information Schemas	None	3.19, $p = .07$	T[5]: -1.03 (0.39), $p = .008$; A: -0.20 (0.38), $p = .59$
	Initial Accuracy	0.62, $p = .43$	-0.92 (0.40), $p = .02$; -0.53 (0.42), $p = .20$
	Initial Confidence	1.45, $p = .23$	-1.02 (0.39), $p = .009$; -0.51 (0.44), $p = .25$
	Both	0.66, $p = .42$	-0.95 (0.40), $p = .02$; -0.58 (0.45), $p = .20$

[5] T = Typical film schema, A = Atypical film schema

Table 14 Continued

Predictor	Variables Controlled	$\chi^2(1)$	*b (SE)*
Centrality * Film Schema	None	3.79, $p = .05$	C[6]: -0.99 (0.45), $p = .03$; P: -0.07 (0.30), $p = .81$
	Initial Accuracy	0.52, $p = .47$	-0.29 (0.57), $p = .62$; -0.07 (0.70), $p = .91$
	Initial Confidence	1.92, $p = .17$	-0.35 (0.55), $p = .53$; -0.03 (0.77), $p = .97$
	Both	0.70, $p = .40$	-0.47 (0.53), $p = .37$; -0.32 (0.81), $p = .70$
Expectancy	None	0.95, $p = .33$	0.25 (0.25), $p = .31$
	Initial Accuracy	1.35, $p = .25$	0.32 (0.27), $p = .23$
	Initial Confidence	1.48, $p = .22$	0.34 (0.27), $p = .21$
	Both	1.57, $p = .21$	0.36 (0.28), $p = .19$
Post-Event Information Type	None	13.27, $p < .001$	-1.05 (0.27), $p < .001$
	Initial Accuracy	2.31, $p = .13$	-0.48 (0.30), $p = .11$
	Initial Confidence	5.62, $p = .02$	-0.73 (0.29), $p = .01$
	Both	2.33, $p = .13$	-0.49 (0.31), $p = .11$
Centrality	None	1.02, $p = .31$	0.47 (0.45), $p = .30$
	Initial Accuracy	0.23, $p = .63$	-0.25 (0.51), $p = .63$
	Initial Confidence	0.33, $p = .57$	-0.28 (0.48), $p = .56$
	Both	0.95, $p = .33$	-0.52 (0.52), $p = .31$

The confidence with which the participant reported their initial answer significantly affected conforming answers with and without statistically controlling for initial accuracy. Items that became non-conforming answers ($M = 61.75$, $M_{adj} = 44.39$, $SD = 35.84$, 95% CI = 47.61, 75.89) were reported by participants with a higher mean

[6] C = Central items, P = Peripheral items

initial confidence compared with items that did go on to become conforming answers (*M* = 41.00, M_{adj} = 33.30, *SD* = 30.16, 95% CI = 25.97, 56.03).

The interaction between initial accuracy and confidence on conforming answers was significant. Simple effects analyses were conducted by examining the relationship between conforming answers and initial confidence, for initially accurate and inaccurate answers separately. Initially accurate answers that became non-conforming (*M* = 81.16, *SD* = 22.24, 95% CI = 75.20, 91.12) were reported with higher initial confidence compared with answers that became conforming (*M* = 45.00, *SD* = 26.36, 95% CI = 30.42, 59.59). Initially inaccurate items that went on to become non-conforming (*M* = 43.11, *SD* = 30.90, 95% CI = 28.46, 57.76) were also reported with higher mean initial confidence than answers that became conforming (*M* = 35.08, *SD* = 27.89, 95% CI = 21.61, 48.55).

Film and post-event information schemas. There was no significant effect of film schema on conforming answers both controlling initial accuracy and not controlling accuracy. Shown in Table 15, there was no significant difference in conforming answers between typical and atypical film items.

Table 15

Proportion of Conforming Answers by Post-Event Information Schema and Film Schema (95% CI)

	Post-Event Information Schema		
Film Schema	**Typical**	**Atypical**	**Total**
Typical	.28 [$.37_{adj}$] (.18, .41)	.12 [$.20_{adj}$] (.05, .23)	.21 [$.31_{adj}$] (.13, .32)
Atypical	.16 [$.29_{adj}$] (.08, .28)	.15 [$.22_{adj}$] (.09, .25)	.15 [$.24_{adj}$] (.09, .24)
Total	.23 [$.34_{adj}$] (.15, .35)	.14 [$.22_{adj}$] (.08, .22)	

The effect of post-event information schema on the proportion of conforming answers reported by participants was significant without controlling initial accuracy and

was also significant when controlling accuracy. Typical post-event information resulted in a higher proportion of conforming answers compared with atypical post-event information, as shown in Table 15.

Post-event information type. An exploratory analysis was conducted to test the effect of post-event information type on conforming answers, which was significant without controlling initial accuracy. Shown in Table 16, participants reporting conforming answers to correct post-event information more often than to misinformation. When controlling initial accuracy this was non-significant.

A new variable of post-event information type and initial accuracy was created which had three levels: an inaccurate initial answer to which correct post-event information was presented, an inaccurate initial answer to which misinformation was presented, or an accurate initial answer to which misinformation was presented. An initially accurate answer to which correct post-event information was presented could not result in a conforming answer.

The effect of the combined post-event information type and accuracy variable on the proportion of conforming answers reported by participants was significant ($\chi^2(2) = 34.98$, $p < .001$). Shown in Table 16, there was no significant difference in the proportion of conforming answers for items that were initially inaccurate and to which either correct post-event information or misinformation were presented ($b = -0.48$, $SE_b = 0.30$, $p = .11$). However, those who were initially accurate and then received post-event misinformation reported a lower proportion of conforming answers compared with those who were initially inaccurate and encountered correct post-event information ($b = -2.13$, $SE_b = 0.39$, $p < .001$) and those who were initially inaccurate and encountered post-event misinformation ($b = -1.66$, $SE_b = 0.38$, $p < .001$).

Table 16

Proportion of Conforming Answers by Initial Accuracy and Post-Event Information Type (95% CI)

Initial Accuracy	Post-Event Information Type		
	Correct Post-Event Information	Misinformation	Total
Accurate	N/A[a]	.06 (.03, .11)	.06 (.03, .11)
Inaccurate	.34 (.21, .50)	.23 (.15, .37)	.28 (.18, .41)
Total	.33[7] (.21, .48)	.15 (.09, .23)	

Note: (a) A conforming answer cannot occur for correct post-event information to an accurate initial answer.

The interaction between the post-event information type and schema on conforming answers was non-significant ($\chi^2(1) = 0.70$, $p = .40$), as was the interaction between the post-event information type and film schema ($\chi^2(1) = 0.08$, $p = .77$).

Final Confidence

Final accuracy and conforming answers. The effect of final accuracy on final confidence was significant ($\chi^2(1) = 150.73$, $p < .001$). As expected, inaccurate final answers were given with a lower mean confidence compared with accurate answers ($b = 32.66$, $SE_b = 2.46$, $p < .001$), as seen in Table 17.

The relationship between conformity status and final confidence was non-significant ($\chi^2(1) = 0.30$, $p = .58$), in contrast to our predictions. The interaction between the final accuracy and conformity status of an answers on final confidence was significant ($\chi^2(1) = 32.21$, $p < .001$). Simple effects analyses were run by examining the effect of final accuracy on final confidence for conforming and non-conforming answers separately. When the final answer was non-conforming, inaccurate items were reported

[7] Due to the nature of the statistical analyses used, the mean total can be either higher or lower than the reported sub-group means.

with lower mean final confidence compared with accurate items (b = 40.46, SE_b = 2.81, p < .001). There was no significant difference between conforming inaccurate and accurate answers (b = 5.38, SE_b = 4.52, p = .12) on final confidence.

Table 17

Mean (SD; 95% CI) Final Confidence by Final Accuracy and Conformity Status

	Conformity Status		
Final Accuracy	**Non-Conform**	**Conform**	**Total**
Accurate	87.09 (20.43; 81.60, 92.58)	69.02 (29.56; 57.47, 80.57)	83.67 (22.24; 75.78, 91.56)
Inaccurate	46.46 (32.56; 39.09, 53.83)	61.58 (23.00; 54.08, 69.08)	51.02 (32.72; 43.13, 58.91)
Total	67.78 (35.42; 55.79, 79.77)	65.93 (27.33; 52.78, 79.08)	

Table 18

Mean (SD; 95% CI) Final Confidence by the Film and Post-Event Information Schemas

	Post-Event Information Schema		
Film Schema	**Typical**	**Atypical**	**Total**
Typical	67.60 (31.34; 55.07, 80.13)	57.15 (37.88; 49.36, 64.94)	64.12 (34.16; 51.83, 76.41)
Atypical	67.58 (32.21; 60.02, 75.14)	72.18 (34.26; 61.63, 82.73)	70.71 (33.57; 56.56, 84.86)
Total	67.35 (31.57; 57.07, 77.63)	67.50 (36.20; 53.06, 81.94)	

Post-event information schema. There was no significant effect of the post-event information schema on final confidence ($\chi^2(1) = 0.30$, p = .58), however the interaction with the film schema was significant ($\chi^2(1) = 8.11$, p = .004). Simple effects analyses were conducted by examining the effect of the post-event information schema on mean

final confidence for typical and atypical film items separately. Shown in Table 18, when a typical film item was presented to participants, typical post-event information resulted in significantly higher mean final confidence compared with atypical post-event information (b = -10.90, SE_b = 3.88, p = .003). When an atypical film item was presented there was no significant difference in final mean confidence between typical and atypical post-event information (b = 3.86, SE_b = 3.93, p = .16).

Final Recollection And Familiarity

Similarly to the initial measures, standardized scores were used for all measures of final recollection, familiarity, and confidence. As shown in Table 19, we can see that recollection and familiarity are strongly positively correlated, as are both recollection and familiarity with confidence.

Table 19

Correlations Between Final Recollection and Familiarity Judgments and Confidence Ratings[1]

	Dependent variable		
	Recollection	Familiarity	Confidence
Recollection	-	.69	.83
Familiarity	.64	-	.75
Confidence	.83	.75	-

Note 1: all figures significant at $p < .001$

Final accuracy. The relationships between final accuracy and both final recollection ($\chi^2(1) = 95.90$, $p < .001$) and final familiarity ($\chi^2(1) = 109.16$, $p < .001$) were significant, with descriptive statistics shown in Table 20. As predicted, inaccurate final answers were reported with lower scores compared with accurate answers for both final recollection (b = 1.42, SE_b = 0.14, $p < .001$) and final familiarity (b = 1.38, SE_b = 0.12, $p < .001$).

Table 20

Final Mean (SD; 95% CI) Recollection and Familiarity Responses by Final Accuracy and Conformity Status

		Conformity Status		
	Final Accuracy	**Non-Conform**	**Conform**	**Total**
Recollection	**Accurate**	5.39 (1.04; 5.09, 5.69)	3.73 (1.51; 3.32, 4.14)	5.11 (1.29; 4.68, 5.54)
	Inaccurate	3.59 (1.75; 3.20, 3.98)	3.67 (1.78; 3.03, 4.31)	3.69 (1.76; 3.26, 4.12)
	Total	4.53 (1.75; 3.94, 5.12)	3.86 (1.67; 3.20, 4.52)	
Familiarity	**Accurate**	5.20 (1.21; 4.79, 5.61)	4.33 (1.27; 3.95, 4.71)	5.04 (1.27; 4.63, 5.45)
	Inaccurate	3.47 (1.69; 3.08, 3.86)	4.09 (1.50; 3.81, 4.37)	3.67 (1.68; 3.26, 4.08)
	Total	4.38 (1.77; 3.82, 3.94)	4.24 (1.42; 3.62, 4.86)	

Conforming answers. The relationship between conformity status and final recollection was significant ($\chi^2(1) = 13.54$, $p < .001$). As shown in Table 20, non-conforming answers were reported by participants with a higher mean recollection score compared with conforming answers ($b = -0.66$, $SE_b = 0.18$, $p < .001$) as predicted. There was no significant relationship between conformity status and final familiarity ($\chi^2(1) = 0.64$, $p = .42$), in contrast to our prediction, with no significant difference between non-conforming and conforming answers ($b = -0.13$, $SE_b = 0.17$, $p = .21$).

There was a significant interaction between final accuracy and conformity status on final recollection ($\chi^2(1) = 28.65$, $p < .001$), and also final familiarity ($\chi^2(1) = 25.31$, $p < .001$). Simple effects analyses were undertaken to examine the relationship between

conformity status and mean final recollection and familiarity for final accurate and inaccurate answers separately. For final accurate answers, non-conforming answers resulted in higher mean judgments than conforming answers for both recollection (b = -1.54, SE_b = 0.19, p < .001) and familiarity (b = -0.94, SE_b = 0.19, p < .001). For inaccurate final answers, there was no significant difference in mean final recollection between non-conforming and conforming answers (b = 0.16, SE_b = 0.25, p = .27), however non-conforming answers were reported with lower mean final familiarity than conforming answers (b = 0.61, SE_b = 0.23, p = .004).

Discussion

The following discussion is separated into several main sections for clarity. Firstly the use of the new stimuli in the current study is discussed, including the items used and excluded. Next the memory characteristics measures and the relationship between them are discussed, followed by the memory report prior to the presentation of misinformation, with focus on the effects of the item schema and centrality. The effects of the schema in the misinformation effect, including both the film and post-event information schemas are next discussed. Following this the effect of the post-event information types, and then the effect of the initial memory in the misinformation effect are examined. Lastly, the final memory characteristics measures are discussed.

Stimuli And Critical Items

The stimuli used in the current study were created for the specific purpose of a misinformation paradigm using schematic critical items. There were two main aims in creating the new films; to decrease the initial accuracy rate, and to counterbalance typical and atypical items within the film and narratives. The films were successful in both of these aims.

Accuracy rates were just over 50% for the critical items in the initial questionnaire, which in turn lead to higher rates of conforming answers. This allowed for a more comprehensive investigation of the trends within the misinformation effect, which will be discussed subsequently. In addition, confidence rates in the current study were around 65%, which is again lower than the previous study.

Using four versions of the film, which included variations on the critical items so that film included either a typical or atypical version of the item, allowed for counterbalancing of the items. This reduced the chance of the critical items changing the effect of the schema on memory, as can occur when using different items that are directly

linked to only one schema. It also allowed to control for the question as a random effect in the statistical analysis.

One item from the films, that of the tool the robber used to break in with, was removed from the data set. The item was reported with high initial accuracy and confidence in the current study and in the pilot studies, and was reported with very few conforming answers. The intense focus on this item during the film may have caused this, and as it was our intent to decrease accuracy and confidence it was decided to remove the item.

Relationship Between The Memory Measures

Several memory characteristics measures were used in the current study to assist us understand the ways in which participants experience their memory retrieval. Confidence ratings and recollection and familiarity judgments were used in both questionnaires. The memory characteristics measures were all significantly related to the accuracy of the item, with higher confidence ratings, and higher recollection and familiarity judgments for accurate compared with inaccurate items. This occurred for both the initial and final memory measures. When recalling an accurate answer the participant often experienced the memory retrieval differently to recalling an inaccurate answer however this is not always the case.

There was overlap in all memory characteristics measures for accurate and inaccurate items, therefore these measures cannot be used to identify accurate answers. We can, however, use these measures to understand how the participant experienced retrieving the memory. Participants were more confident that accurate answers were correct than inaccurate answers, and these items were more familiar and were retrieved with episodic detail. There were also significant relationships between the memory characteristics measures, showing that highly confident items were highly familiar and

highly recollected, whilst higher recollection was also related to higher familiarity.

Memory Report Prior To The Presentation Of The Post-Event Information

The schema of the film items varied between the four versions of each critical item, with two being typical and two atypical. As well as the schema, the centrality of the film item was manipulated. Centrality did not vary within the critical items; each critical item was either central or peripheral as defined from the pilot studies. Within the misinformation literature the schema (see Charter 1) and centrality (e.g. Dalton & Daneman, 2006) of items have been considered, but not in conjunction. Peripheral items can be schema typical or atypical, as well as irrelevant. In the current study the majority of background or environment items were peripheral.

Atypical film items were reported with higher initial accuracy compared with typical items, as predicted, however this effect only occurred for central and not peripheral items. There was no effect of schema for peripheral film items, showing that although these items can be considered schematic they affect the memory differently compared with central items. Both the film schema and centrality of the items significantly affected initial confidence and recollection and familiarity judgments without controlling accuracy, but there were no significant effects when controlling accuracy. The accuracy of the initial items and not the schema or centrality affects the memory retrieval experience of the item. As discussed in Study 1, there are two main reasons for differences in accuracy rates: ease of retrieval of the item, and differences in attention during the films.

Items that are easier to retrieve from the memory were likely to be reported with higher accuracy than items that are difficult to retrieve. Participants in the current study may not have been highly motivated to continue retrieval attempts if the item was not immediately retrieved, as there was no benefit to them of being accurate. The items they

report are likely those that were easily retrieved, which was supported by the memory characteristics measures, showing that accurate items were retrieved with both recollected detail and familiarity, and were highly confident.

Typical items may have been easier to retrieve from the memory than atypical items, due to typical items being easily retrieved from the semantic memory as consistent with the schema, and also from the episodic memory as an item from the event witnessed. In contrast atypical items may be retrieved from the episodic memory also as a part of the witnessed event, but only from the semantic memory as a contradictory item or special case. There were no differences between these items on either familiarity or recollection judgments, indicating that the items were active within these memory systems equally. The interaction between centrality and schema on initial accuracy showed that atypical central items are reported more accurately than typical items, which may therefore be due to the higher attention paid to these items whilst viewing the film.

The lack of difference between typical and atypical peripheral items on initial accuracy may have been due to similar retrieval strategies for both item types. The peripheral schema may be a lesser focus of the semantic memory, so this system may not have been activated for the schematic peripheral items. This would have required the participants to use their episodic memory only for retrieval of these items. The same argument can also apply to the attention given to these items during the film. If the schema for peripheral items is less active than for central items, the atypical film items may not appear as surprising during the film and would therefore not be given any greater attention compared with typical items. Peripheral items in general, being of a less active schema, would be given less attention than central items.

Attention differences between typical and atypical versions of the central items would lead to differences in accuracy, as found in the current study. As opposed to Study

1 where each question was of a different schema, in the current study each question had both typical and atypical versions. The differences in accuracy can therefore be attributed to the schema and not the question. Atypical items were reported more accurately for central items, but may also have been attended to more during the film. Theoretically, typical items may have been moderately attended to as they were expected (Tuckey & Brewer, 2003) whereas atypical items may be unexpected and therefore surprising, gaining heightened attention.

Attention to items during the film needed to occur for retrieval to play a part in memory reporting. If an item was not attended to during the film it could not be encoded into memory and later retrieved. It was therefore only items that were attended to that can cause differences in retrieval. The schema plays a role in both attention and retrieval, and these themes will both be investigated further, examining memory processed through confidence, and recollection and familiarity measures.

The difference in accuracy patterns for central and peripheral items may have been one explanation for the contradictory results of schematic misinformation studies in the literature. The initial accuracy for film items varied due to centrality affecting the schema, however without measuring this it is unknown. As shown in Study 1 and in the current study, the initial accuracy of an item affects conforming answers, therefore differences may be seen due to this. The stimuli used by Nemeth and Belli (2006) are an example where the items used may be peripheral. The critical items used by Nemeth and Belli (2006) examined items in the environment, similar to the peripheral items in the current study. Luna and Migueles (2008) used a combination of environmental items and robber items. Studies that use only added misinformation (e.g. Roediger et al., 2001; Maras & Bowler, 2011) start with a different type of initial memory compared with studies for which the original event have schematic items.

Schema's Within The Misinformation Effect

The predicted interaction between the film and post-event information schemas on conforming answers was borderline significant, and partially supported our prediction. As expected, typical post-event information presented to a typical film item resulted in high proportions of conforming answers, however in contrast to our prediction atypical post-event information presented to an atypical film item were reported with fewer, not similar, conforming answers. Predictions were based on the idea that post-event information of the same schema as the film item would be less discrepant and blatantly contradictory, and would therefore be accepted more often than post-event information of the opposite schema. The results show, however, that atypical post-event information is reported with conforming answers less frequently than typical information. When the typical post-event information is similar to the original film item this effect is enhanced.

Typical items, in terms of both film items and post-event information, are consistent with the schema, whilst atypical items clash with this. The combination of typical film and post-event information schemas is the only combination where one of the items does not contradict the schema. The post-event information is a newer piece of information compared with the film item, and may be retrieved from semantic memory easily for typical items. As the typical film item is similar to the original item the participant may not realize there was a discrepancy between the items. Due to the similarity of the items and the ease of retrieval for typical items through the semantic and episodic memory systems, typical post-event information to a typical film item is likely to be accepted as the accurate answer.

Atypical post-event information to an atypical film memory was predicted to have similar rates of conforming answers compared with the typical to typical combination, however this was not the case. Atypical items are remembered though the episodic

memory, and as a contradiction to the schema. Atypical items are not reported from the semantic memory, lending support to this being the process involved in the heightened rate of conforming answers for typical post-event information to a typical film item. For an atypical to atypical combination both items contradict the schema and are therefore likely to be noticed as discrepant from each other. Participants may then proceed with additional processing to determine the correct item from the film. This would also occur when one of the items is atypical but the other typical.

Discrepancy detection occurs when the participant notices that there is a difference between the post-event information and the original event. Misinformation that is blatantly inaccurate was often detected and rejected at the time of presentation (Loftus, 1979). Atypical items are likely blatant misinformation as they contradict what the participant expected from the event, but post-event information of a different schema to the original event may have also been blatantly inaccurate. When a discrepancy is detected the participant will often reject the item, but may also accept it as correct. This is likely not to occur for atypical items. It is probable that discrepancy detection plays a role in the misinformation effect for schematic items, and was proposed as a mechanism for the effect by Hekkanen and McEvoy (2005) but was not directly tested. Blank (1998) described the misinformation effect as occurring due to participants assuming no difference between the sources, which was destroyed when discrepancies were detected. This detection therefore reduces the effect. Discrepancy detection has not specifically been tested in a schematic misinformation effect, and may have produced findings that help our understanding of the mechanisms behind the effect.

The level of expectancy of schematic post-event information was also tested in the current study. Highly versus less expectant items did not significantly affect conforming answers, and did not interact with the post-event information schema. There

was no difference between high and less typical items, similarly to the findings of Huff et al. (2013) but in contrast to Roediger et al. (2001). This indicated that it is the schema-relevance, and not the level of expectancy, that is driving schematic misinformation effects.

Post-Event Information Type In The Misinformation Effect

The post-event information in the current study was either correct or misinformation. Although both types of post-event information were presented to both accurate and inaccurate initial memories, conforming answers could not occur if the memory report and the post-event information were the same. This occurred when the initial answer was accurate and correct post-event information was presented. When the accuracy of the initial item was taken into account misinformation presented to an accurate initial memory resulted in the fewest conforming answers. This is unsurprising as initial accuracy plays a large role in conforming answers, as discussed in fuller detail later in this discussion.

There was no significant difference between correct post-event information and misinformation on conforming answers when the initial memory was inaccurate, however there was a trend towards more conforming answers for correct post-event information. Only a quarter of post-event information items were correct therefore there were fewer cases where conforming answers could occur for correct information. Due to this, future studies will continue to examine this effect with more balanced proportions of correct post-event information to misinformation.

The lack of difference between correct post-event information and misinformation for inaccurate items on conforming answers contradicted the findings of Rush and Clark (2014). As discussed above, one explanation for the lack of effect in the current study is the fewer possibilities for conforming answers to correct post-event information than

misinformation, which will be rectified in future studies. Until further research is conducted, however, potential explanations for either an effect or lack of need to be examined. There was no indication in the current study that an item was incorrect, and items in the narrative were counterbalanced with the film items, which reduced differences due to the specific question. To the participant there was no difference between the correct post-event information and the misinformation, except that one was correct. If the participant was unable to recall the accurate item, however, there was no way for them to know which items were correct or misinformation. This meant that there should be no difference in conforming answers between these two types of post-event information.

The trend shows that a small difference may occur between post-event information types on conforming answers for inaccurate initial items. If there is a difference, it must be driven by the correct post-event information being accurate. This was the only difference between this information and the misinformation. But if the participant was unable to retrieve the original memory, how would they be able to determine this? It is possible that these items had memory traces that were too weak to be recalled, but that may be recognized when presented (Sauer, Brewer, & Weber, 2008). That is, the participant may be able to correctly recognize the item when it is presented in the narrative even when they couldn't initially recall it, and due to this second presentation are able to report it in the final questionnaire. This will be examined further in Study 3.

Initial Memory On The Misinformation Effect

The initial memory of the event played a large role in the subsequent reported memory. Although the focus of much misinformation research has been on the misinformation itself, this information must interact with the initial memory to create a

conforming answer. The results of the current study showed that accurate memories were less likely to become conforming answers than inaccurate answers, and that confident memories are also protected against misinformation. As discussed earlier, accurate memories are only affected by misinformation, as the participant has already answered with the same answer as the correct post-event information and therefore cannot report a conforming answer. Inaccurate memories are affected by both correct post-event information and misinformation.

There are several possible reasons for the reduced rate of conforming answers for accurate and strong memories. Firstly, participants who had a strong memory may not have attend to the misinformation as they did not need this to supplement their memory for the item. Secondly, participants may have noticed the discrepancy and may have rejected this at the time of detection. Thirdly, the initial memory may have been stronger than the new misinformed memory, thereby resulting in the continued retrieval of this item. It is likely that these processes all play a role, and may also work in conjunction with each other.

Attending to the post-event information is vital if it is to be recalled as a conforming answer, as if the participant does not attend to it they will not encode it into memory and therefore cannot retrieve the item. The retrieval enhanced suggestibility (RES) effect (e.g. Chan et al., 2012) may occur due to increases in attention for items that the participant would not naturally attend to, but did due to its presence in the initial questionnaire. This effect has been shown not to occur with schematic misinformation (Huff et al., 2013), however it highlights the importance of attention to the post-event information for the misinformation effect to occur. The RES findings imply that when participants either didn't do an initial test or were accurate, they did not attend to the post-event information resulting in reduced rates of conforming answers.

Discrepancy detection, as described earlier, occurs when the participant notices the difference between the post-event information and the film. If the participant has a strong memory it is more likely that the participant will notice a difference between this and the post-event information. If the participant has a weak memory they may not notice that the post-event information is different to their initial memory, or they may not have an initial memory to compare the information with. Strong accurate memories are therefore more likely to result in detected discrepancies than weak inaccurate memories. It is assumed that when a discrepancy is noticed the participant will reject this an incorrect, however if the participant has a weak memory they may decide to report the post-event information. It would therefore be important in a discrepancy detection study to determine when discrepancies are being detected, and how participants decide which item to report.

If the post-event information is attended to and encoded into the memory, regardless of whether it was rejected at the time of attention, it may be retrieved from the memory. Whichever item is retrieved more easily is likely to be reported, and if both items are retrieved the participant will make a judgment between them. If the initial memory is strong and accurate it is likely to be retrieved easily and therefore reported. In contrast if the original memory is weak and the post-event information is stronger, this participant will report the new item. Memory characteristics measures can be used to determine the ease of retrieval of items, and are discussed in the next section.

Memory Characteristics Of Conforming Answers

Final confidence gave an understanding of the participants memory retrieval experience and also whether they believed the answer is likely to be accurate or not. There was no significant effect of conforming answers on final confidence, however this did interact with the final accuracy of an answer. Non-conforming accurate items resulted in

higher final confidence than non-conforming inaccurate items, but there was no difference between conforming accurate and inaccurate items. This shows good memory monitoring by participants when they are reporting a non-conforming answer, and that when reporting a conforming answer the accuracy of the post-event information did not make a difference to final confidence. When looking at inaccurate answers only however we find that conforming items result in higher confidence than non-conforming items. This may indicate that conforming answers are easier to recall than non-conforming answers as they were encoded more recently, or that participants believe that the post-event information is more likely to be accurate than their own memory.

Conforming answers resulted in a larger increase in confidence from the initial to the final memory tests compared with non-conforming answers. There was no effect of conformity status on final confidence, but the initial confidence showed highly accurate items were less likely to become conforming answers that less confident items. This increase in confidence suggests that participants believed that the post-event information was more likely to be accurate than their initial memory. Alternately, this item may have been easier to retrieve from the memory compared with the initial answer.

The post-event information type also affected the change in confidence, but there was no interaction with conformity status. Correct post-event information resulted in a greater increase in confidence compared with misinformation. The correct information would confirm an accurate initial answer which would increase the participants confidence that this was accurate, but may also have resulted in a conforming answer for initially inaccurate items. This would then have resulted in an increase in confidence. In contrast, when participants didn't conform to misinformation this contradicted their memory, but even when conforming a contradiction with the memory occurred. This would cause the participant to doubt their memory during the final memory test.

For both final recollection and familiarity there was an interaction between conformity status and final accuracy. Accurate non-conforming answers were given with higher recollection and familiarity judgments compared with accurate conforming answers. Accurate non-conforming answers were retrieved from the memory with more episodic detail and with greater familiarity compared with conforming answers, as expected when participants are answering about the film. Inaccurate non-conforming answers were reported with lower familiarity compared with conforming answers, and there was no difference on recollection. When an inaccurate answer was reported, both conforming and non-conforming answers are retrieved with similar episodic details, but conforming answers are more familiar compared with non-conforming answers. This may have been due the post-event information item having been presented to the participants compared with non-conforming inaccurate items which were not presented at all during the study. The higher familiarity of conforming inaccurate compared with non-conforming inaccurate items may be an indication of why participants report conforming items instead of maintaining their initial answers, especially when the initial answer is inaccurate.

There were similar patterns of results between the judgments from Study 1 and the scales from Study 2. There were significant interactions between final accuracy and conformity status on both sets of answers, with the highest proportion of remember judgments and the highest mean recollection for accurate non-conforming answers. A higher mean familiarity score was also reported for accurate non-conforming answers (in Study 1) compared fewer know judgments for accurate non-conforming answers (in Study 2). This difference, however, can be attributed to the fact that participants who reported a remember judgment could not give a know judgment, whilst participants who gave a high recollection rating could also give a high familiarity rating.

The final confidence for each item was affected by an interaction between the film and post-event information schemas. When typical post-event information was presented to a typical film item the final confidence was higher compared with atypical post-event information. In contrast, there was no significant difference between typical and atypical post-event information presented to an atypical film item. Atypical post-event information to a typical film item contrasted with both the film and schema which made it less believable, whereas typical post-event information to a typical film item was similar across the study and the participant's schema. When the film item was atypical, the schema is contradicted and the post-event information would either be in line with the initial item or the schema (for atypical and typical post-event information respectively), thereby resulting in similar confidence for both post-event information schemas for atypical film items.

There were significant interactions between the film and post-event information schemas on final recollection and familiarity. Similarly to the effect on confidence, for a typical film item, typical post-event information resulted in higher recollection and familiarity scores compared with atypical post-event information. For atypical film items there was no significant difference between typical and atypical post-event information on final familiarity, but atypical post-event information resulted in higher recollection scores compared with typical post-event information. When the schema of the post-event information was the same as the schema for the film item the final recollection scores were higher than for a mismatched schema combination. The matched schemas were retrieved from the memory with episodic detail more than the mismatched schemas. Typical information to a typical film item was more familiar than atypical post-event information, but both post-event information schemas to an atypical film item were similarly familiar.

The post-event information type did not affect final recollection judgments, but there was a significant effect on final familiarity, and neither of the interactions with conformity status were significant. Correct post-event information was more familiar compared with misinformation, but was retrieved with similar episodic detail. Correct post-event information was presented to participants twice, once during the film and a second time during the narrative, whereas misinformation was presented only during the narrative. The extra presentation of the correct post-event information may increase the familiarity of this item due to the increase in sources it can be retrieved from, and the reinforcement of this item in the memory.

Future Research

Two main avenues for future research have been discussed in the current study, relating directly to specific results found here. Firstly, discrepancy detection has been used in misinformation studies, but not looking specifically at schema or initial memory. Asking participants to identify discrepancies after they have completed the method as used here would allow for determination of differences in discrepancies detected for different schemas. In addition, it could be observed if discrepancy detection is a driving factor of accurate initial items, resulting in fewer conforming answers. Secondly, recognition tests could be used to determine if correct post-event information is occasionally stored in the memory below the recall but above the recognition level. If the participant is recognizing the correct post-event information as accurate when presented in the narrative, any difference in conforming answers will be reduced. To clearly examine this process it will be important to present the participant with similar proportions of correct post-event information and misinformation for the critical items, unlike the current study where the majority where misinformation.

Chapter 5

Study 3: The Use Of Initial Cued-Recall And Recognition Tests In A Schematic Misinformation Paradigm

In the previous studies, conforming answers were shown to occur to correct post-event information as well as misinformation, and a trend towards higher proportions of conforming answers for correct post-event information compared with misinformation was found in Study 2. The aim in the current study was to further investigate the difference between post-event information types, specifically contradictory misinformation and correct post-event information. Two initial test types were used to determine if participants can recognize (compared with recall) the correct item during the tests, therefore reducing the likelihood of report a conforming answer for these items.

A Comparison Of Correct Post-Event Information And Misinformation

In Study 2, a difference was found between correct post-event information and misinformation in their effect on conforming answers, however this was non-significant when examining only inaccurate initial items. Rush and Clark (2014) found that correct post-event information was more likely than misinformation to be reported on a subsequent memory test similarly to the main effect of post-event information type found in the previous study. The use of a free-recall test by Rush and Clark (2014) makes it impossible to determine if the initial memory of the participants was accurate or inaccurate when the item was withheld, therefore we cannot conclude that this same pattern would occur for only inaccurate items.

For participants in Study 2, the amount of presented correct-post event information to misinformation was a ratio of 1:3, which limited the number of items participants could potentially report conforming answers to. There should be little or no

difference in accuracy for items to which either post-event information type is given, therefore a closer investigation of this trend will be possible.

If a difference between post-event information types on conforming answers is found, similarly to that by Rush and Clark (2014), it may be due to the correct post-event information having been presented to the participants in the film. Items in Study 2 were counterbalanced, with each of the four variations of each question being presented as the correct item and as misinformation to the other three items. Any difference in conforming answers between the post-event information types is therefore not due to a specific item. During the study there was no indication that misinformation was being presented, or which items we were specifically interested in. The only differences between the correct post-event information and misinformation was that the correct item had been presented during the film. When the participant was initially inaccurate, however, they were not able to recall this item.

Cued-recall tests were used in Study 2 with participants reporting an answer to every question even if they had to guess. Participants were prompted for the specific item and were forced to report an answer, therefore items were not withheld as they may have been in Rush and Clark's (2014) free-recall tests. Where recognition tests are used instead of recall, participants are able to recognize items that are below the recall threshold in the memory. Recall, whether free or cued, is more difficult than recognition as the item needs to be actively retrieved rather than recognized (Sauer et al., 2008). That is, recall only taps in to the part of the memory that can actively retrieve items, whereas recognition allows for items to be identified as correct that are below this threshold. Participants may therefore be able to recognize items that they are unable to recall, however in Study 2 were not given this opportunity.

Participants may be able to recognize the correct item and reject the

misinformation when presented a choice of items. Correct post-event information may be recognized as accurate from the narrative, and is then later recalled and scored as a conforming answer. The use of an initial recognition test allows the participant to recognize the accurate item prior to the narrative, removing the chance to report a conforming answer for that item.

Answers to which the participant is unable to recognize but subsequently report a conforming answer for would be working in the same way for both correct post-event information and misinformation. The participant has no memory for the item, and any post-event information is new regardless of whether this is correct information or misinformation.

Test Types In The Current Study

Recognition tests have been widely used in memory research including misinformation studies (e.g., Luna & Migueles, 2008). There are several potential problems with using recognition tests prior to the presentation of the post-event information. Old/new judgments, especially with force-report, allow for a high chance to guess the answer correctly. Multiple-choice recognition reduces but does not eliminate this problem. Furthermore, if an item is presented in the initial test and again as post-event information it may imply that the item is accurate. This would occur for both correct items and misinformation. In addition, measures of memory characteristics mean different things for recall and recognition memories and are therefore not directly comparable.

The current study will use initial cued-recall and recognition tests, but only final cued-recall tests. This allows for more direct comparison with Study 2, but importantly only allows the participants one chance to view the item (during the narrative) if they are given an initial cued-recall test, but two chances if they are given an initial recognition

test. If participants are able to recognize the item from either the initial test or the narrative we will see different patterns in conforming answers between the test types. Recognizing the item during the initial test should increase accuracy levels and reduce conforming answers for correct post-event information because accurate initial items cannot be conformed on. If participants are only able to recognize the accurate item from the narrative there will be no difference in conforming answers between the test types, as participants will be similarly accurate and have similar conforming answers regardless of the test. No difference between correct post-event information and misinformation, coupled with an effect of initial accuracy, would show that it is accuracy and not the post-event information type that is driving the trend of more conforming answers for correct post-event information to misinformation in Study 2, and the findings of Rush and Clark (2014).

In the cued-recall condition the participant is only presented with the post-event information item once, during the narrative. In the multiple-choice recognition test condition, however, the correct item will be presented twice; once as post-event information but also during the initial (recognition) test. As mentioned above, this presents the problem of the participant being exposed to this item more than once. When given as post-event information the participant may believe that the item has to be accurate as it was included in the test as well as the narrative. The extra presentation may increase the effect of the item has on conforming answers. This has been shown with schematic presentations when multiple presentations of the post-event information are used (Huff et al., 2013).

To examine the effect that the extra presentation of the post-event information item two recognition tests will be used. One will present the participant with every possible variation from the films and misinformation. That is, the correct item and all

possible misinformation items will be used for each question regardless of which variation is given in the film. The second test will use the correct item, the items that are not used as misinformation, and a schema-similar replacement for the misinformation. This allows for balancing of the schema options in the initial test without presenting the actual item. We can then compare the effects of the misinformation when presented twice compared with presented once.

The hypotheses regarding the effects of the initial questionnaire type are:

1. The initial questionnaire type will affect the initial accuracy. The two multiple-choice recognition tests will result in a greater proportion of accurate answers compared with the cued-recall test.
2. The initial questionnaire type is predicted to interact with the post-event information type and accuracy measure on conforming answers. Participant who completed the initial cued-recall test and the recognition test without misinformation will have the highest proportion of conforming answers to correct post-event information, followed by misinformation to an inaccurate initial answer, and finally misinformation to an accurate initial answer. Participants who completed with recognition test with misinformation will have no difference in the proportions of conforming answers between correct post-event information and misinformation when the initial memory was inaccurate, but misinformation to an accurate memory will have lower proportions of conforming answers.

Recognition Memory And Schemas

Differences in accuracy rates for schematic items have been found due to the type of tests administered to participants. Rojahn and Pettigrew (1992) in their meta-analysis on social schemas described an advantage of atypical items during recall tests, but for typical items in recognition tests where guessing was controlled. This is a potential

explanation for the differences in finding in the schema misinformation literature, where free-recall, cued-recall, and recognition tests have all been used. The current study will be using only cued-recall final memory tests, however the results may give an indication of whether the test type could be a factor in the differing findings.

The hypothesis regarding the interaction between the film schema and initial questionnaire type on initial accuracy is:

3. The test type will also interact with the film schema to affect initial accuracy, with the recognition tests having higher accuracy for typical items and the cued-recall test having higher accuracy for atypical items.

Stimuli And Measures In The Current Study

Two of the films used in Study 2 will be used again in the current study. There was little difference between the four films on the initial memory, therefore using two films with one item for each schema and all four items as post-event information will be used. Reducing the number of films also reduces the number of narratives needed. Confidence measures will be taken but recollection and familiarity scales will not be used in the current study. These measures were difficult to use with participants, and were strongly related with confidence.

Method

Participants

First year psychology students from Flinders University, Australia, participated in exchange for course credit. The 75 participants (50 female, 22 male, no identifying information was provided by 3 participants) had a mean age of 23.47 years (*SD* = 6.65).

Design

Each session was randomly allocated to one of two film conditions. Within each session participants were randomly allocated to one of four narratives per film (eight in total), which included both correct post-event information or misinformation. Participants were also randomly allocated to complete either the initial cued-recall or one of the two multiple-choice recognition tests.

This contrasts with Study 2, with a reduced number of films used here to simplify the process and reduce the number of variables used in the study. Additionally new conditions for recognition questionnaires were added, specifically to test the difference between recall and recognition questionnaires on participant's reported memory.

Materials

Films. Two of the films from Study 2 were used so that only one typical and one atypical critical version of each item was used.

Narratives. The same basic narrative from Study 2 was used, however the specific combination of post-event information items is different. This is a reflection of using two videos, therefore changing the post-event information items in the narratives to ensure the correct presentation of items for each condition. Each version of the film had four associated narratives which provided either correct post-event information or contradictory misinformation for the nine critical items. At the end of every paragraph

participants were asked to rate the confidence with which the information was presented on a scale from "Very Confident" to "Very Unconfident". This was to ensure participants attended to the information enough to answer these questions, and to attend to the post-event information items.

Initial questionnaire. Participants were given either a cued-recall or one of two multiple-choice recognition test to complete. The instructions for both tests were the same, with the exception of a line requesting participant circle the correct answer for the recognition tests or write the answer for the cued-recall test. The questionnaires contained 18 questions which asked about the nine critical items with nine filler questions also used. The critical questions were never presented consecutively. Both the critical and the filler questions asked about the environment and the robbers.

The two multiple-choice recognition tests differed in the options given for the critical items. The questionnaire that included misinformation gave the accurate item, plus the three possible misinformation options (only one was given as misinformation), and a "none of the above" option. The questionnaire without misinformation had the same options except that the item actually given as misinformation during the subsequent narrative was replaced with a schema-similar option. The recognition test that did not include misinformation is given in Appendix 10.

Final questionnaire. The final questionnaire from Study 2 was again used. This had identical questions to the initial cued-recall questionnaire, with some slight changes to the instructions as given in Appendix 8. These changes emphasized that participants needed to respond with their memory of the film.

Maze task. The same 5-minute timed maze task was used as a filler from Study 2. This consisted of five mazes of varying difficulty.

Procedure. Sessions were run with one to five participants. Firstly participants

watched the film. Next participants completed the initial questionnaire and then handed this back to the researcher. Participants then read through the narrative and completed the embedded questions, which was followed by the 5 minute timed maze task. Finally participants completed the final questionnaire, were debriefed, and thanked for their time.

Scoring

Accuracy. The memory report was compared with the film item to determine accuracy. When the report was similar to the film, the item was scored as accurate. For example, if the participant reported "a dark blue jumper" but it was actually dark grey, this was scored as accurate.

Conforming answers. An answer was scored as conforming when it was changed from the initial memory test to the final memory test, and this change reflected the post-event information. A conforming answer could only be accurate if the initial memory was inaccurate and the participant changed their answer to reflect correct post-event information. Conforming answers could not occur to correct post-event information when the initial answer was accurate.

Post-event information type. Correct post-event information and contradictory misinformation were given to participants. To account for misinformation being possible for both initially accurate and inaccurate items, the post-event information type was made into a new variable to take this into account. The new variable had three levels: correct post-event information to an inaccurate initial memory; misinformation to an inaccurate initial memory; and misinformation to an accurate initial memory.

Results

As in previous studies, the memory prior to the presentation of post-event information was considered initially, before examining the misinformation effect. Lastly, final confidence was addressed. The subscript "adj" is reported wherever the statistic is adjusted by accuracy.

Memory Report Prior To The Presentation Of The Post-Event Information

Initial questionnaire type on initial accuracy. There was a significant effect of initial questionnaire type on the accuracy of participants answers ($\chi^2(2) = 10.72$, $p = .005$). Estimated proportions of accuracy are shown in Table 21. As predicted, participants who completed the cued-recall test reported a lower proportion of accurate initial answers, compared with those who completed the recognition test that included the misinformation ($b = 0.82$, $SE_b = 0.30$, $p = .006$), or the recognition test that didn't include the misinformation ($b = 0.92$, $SE_b = 0.31$, $p = .003$). There was no significant difference between those who completed either of the two recognition tests ($b = 0.10$, $SE_b = 0.31$, $p = .74$).

Table 21

Proportion of Accurate Initial Answers by Initial Questionnaire Type and Film Schema (95% CI)

	Film Schema		
Initial Questionnaire Type	**Typical**	**Atypical**	**Total**
Cued-Recall	.53 (.24, .81)	.72 (.54, .84)	.63 (.34, .84)
Recognition Including Misinformation	.89 (.77, .95)	.69 (.48, .85)	.79 (.54, .92)
Recognition Without Misinformation	.85 (.70, .93)	.78 (.50, .91)	.81 (.69, .89)
Total	.77 (.52, .91)	.72 (.41, .90)	

Film schema on initial accuracy. In contrast to our predictions there was no significant effect of film schema on initial accuracy ($\chi^2(1) = 1.55$, $p = .21$).

However, the interaction between the film schema and initial questionnaire on initial accuracy was significant ($\chi^2(2) = 12.43$, $p = .002$). Simple effects analyses were conducted by examining the effect of film schema on initial accuracy for each of the initial questionnaire types separately, and also examining the effect of the initial questionnaire type on typical and atypical film items separately. Table 21.10, *SEb* = 0.31, $p = .74$).

shows the proportion of accurate answers by questionnaire type and schema. For the initial cued-recall test, typical film items resulted in a lower proportion of initially accurate answers compared with atypical items ($b = 0.92$, $SE_b = 0.41$, $p = .02$). For the recognition test including misinformation, typical items resulted in a higher proportion of accurate answers than atypical items ($b = -1.24$, $SE_b = 0.41$, $p = .002$). There was no significant difference on initial accuracy between typical and atypical items for the recognition test without misinformation ($b = -0.53$, $SE_b = 0.44$, $p = .23$).

For typical film items, the initial cued-recall test resulted in lower initial accuracy compared with both the recognition test including misinformation ($b = 1.88$, $SE_b = 0.45$, $p < .001$), and the recognition test without misinformation ($b = 1.54$, $SE_b = 0.44$, $p < .001$). There was no significant difference in initial accuracy for typical film items between the recognition test including misinformation, and the recognition test without misinformation ($b = -0.34$, $SE_b = 0.47$, $p = .47$). For atypical film items, there were no significant differences in initial accuracy between the initial cued-recall and recognition including misinformation ($b = -0.14$, $SE_b = 0.40$, $p = .72$), or recognition without misinformation ($b = 0.31$, $SE_b = 0.42$, $p = .47$). There was also no significant difference between the recognition test without, or with misinformation ($b = 0.45$, $SE_b = 0.42$, $p =$

.28).

Initial accuracy and confidence. The initial accuracy of a participants answer significantly affected the mean initial confidence of the answer ($\chi^2(1) = 138.74$, $p < .001$). As can be seen in Table 22, inaccurate items were reported with lower mean confidence than accurate items ($b = 36.88$, $SE_b = 2.88$, $p < .001$), as expected.

Table 22

Mean [Mean adjusted] (SD; 95% CI) Initial Confidence by Initial Accuracy and Film Schema

	Initial Accuracy		
Film Schema	**Accurate**	**Inaccurate**	**Total**
Typical	73.38 (30.40; 63.52, 83.24)	46.93 (31.29; 36.13, 57.73)	65.65 [38.93adj] (34.58; 49.56, 81.74)
Atypical	91.44 (11.14; 83.89, 98.99)	43.72 (30.76; 36.61, 51.83)	75.30 [50.39adj] (33.30; 57.55, 93.05)
Total	82.06 (24.91; 72.70, 91.42)	45.18 (30.92; 35.18, 55.18)	

The Misinformation Effect

For the effect of the predictor variables on conforming answers, analyses were run with and without controlling for the effects of initial accuracy and/or confidence, and are shown in Table 23.

Initial questionnaire type. The effect of initial questionnaire type on conforming answer was non-significant when controlling for initial accuracy and without controlling initial accuracy.

Table 23

Conforming Answers by Questionnaire Type, Confidence, Post-Event Information Type, Film and Post-Event Information Schemas, and Centrality, With and Without Initial Accuracy Controlled in the Model

Predictor	**Variables Controlled**	**$\chi^2(1)$**	***b (SE)***
Initial Accuracy	None	47.74, $p < .001$	-2.42 (0.40), $p < .001$
Initial Confidence	None	38.13, $p < .001$	-24.12 (4.27), $p < .001$
	Initial Accuracy	10.26, $p = .001$	-10.27 (4.08), $p = .001$
Initial Questionnaire Type (df = 2)	None	3.44, $p = .18$	Recall vs. Inc: -0.27 (0.35), $p = .43$; Recall vs. W/out: -0.70 (0.37), $p = .06$
	Initial Accuracy	1.47, $p = .48$	-0.05 (0.38), $p = .90$; -0.48 (0.41), $p = .25$
	Initial Confidence	1.23, $p = .54$	-0.-7 (0.37), $p = .86$; -0.43 (0.41), $p = .29$
	Both	1.41, $p = .57$	0.03 (0.40), $p = .94$; -0.41 (0.43), $p = .35$
Initial Accuracy * Confidence (df = 2)	None	0.87, $p = .65$	Accurate: -22.84 (6.94), $p < .001$; Inaccurate: -6.08 (5.32), $p = .13$
Post-Event Information Type	None	38.36, $p < .001$	-1.96 (0.32), $p < .001$
	Initial Accuracy	7.09, $p = .008$	-1.01 (0.38), $p = .007$
	Initial Confidence	20.91, $p < .001$	-1.56 (0.34), $p < .001$
	Both	7.07, $p = .008$	-1.04 (0.39), $p = .007$
Film Schema	None	9.34, $p = .002$	-0.91 (0.30), $p = .002$
	Initial Accuracy	14.92, $p < .001$	-1.29 (0.34), $p < .001$
	Initial Confidence	8.30, $p = .004$	-0.93 (0.32), $p = .004$

	Both	14.53, p <.001	-1.33 (0.35), p < .001

Table 23 Continued

Predictor	**Variables Controlled**	**$\chi^2(1)$**	***b (SE)***
Post-Event Information Schema	None	3.89, p = .05	-0.59 (0.30), p = .04
	Initial Accuracy	5.20, p = .02	-0.74 (0.35), p = .02
	Initial Confidence	2.72, p = .10	-0.52 (0.32), p = .10
	Both	3.87, p = .05	-0.67 (0.33), p = .04
Film * Post-Event Information Schemas (T = Typical film item, A = Atypical)	None	10.09, p = .001	T: 1.33 (0.48), p = .006; A: 0.85 (0.55), p = .12
	Initial Accuracy	1.66, p = .20	-0.80 (0.54), p = .14; 0.13 (0.61), p = .83
	Initial Confidence	6.61, p = .01	-1.09 (0.50), p = .03; 0.92 (0.64), p = .15
	Both	2.41, p = .12	-0.74 (0.54), p = .17; 0.65 (0.66), p = .33
Centrality	None	2.42, p = .12	0.87 (0.53), p = .10
	Initial Accuracy	0.02, p = .88	0.09 (0.61), p = .88
	Initial Confidence	0.09, p = .76	0.15 (0.49), p = .76
	Both	0.05, p = .83	-0.14 (.63), p = .82

Initial accuracy. The initial accuracy of a participants answer significantly affected the proportion of conforming answers given for that answer. Shown in Table 24, inaccurate initial answers were reported with a greater proportion of conforming answers compared with accurate initial answers as predicted. There was no significant interaction between initial accuracy and the initial questionnaire type on conforming answers.

Post-event information type. The effect of post-event information type on conforming answers was significant with and without controlling accuracy. When the

participant was presented with correct post-event information a higher proportion of conforming answers were given compared with misinformation, shown in Table 24. There was no significant interaction between the post-event information type and initial questionnaire type on conforming answers ($\chi^2(2) = 2.20$, $p = .33$).

Table 24

Proportion of Conforming Answers by Initial Accuracy and Post-Event Information Type (95% CI)

	Post-Event Information Type		
Initial Accuracy	**Correct PEI**	**Misinformation**	**Total**
Accurate	N/A[(a)]	.06 (.03, .12)	.06 (.03, .12)
Inaccurate	.51 (.34, .68)	.28 (.14, .48)	.40 (.26, .56)
Total	.49 [$.51_{adj}$] (.33, .65)	.12 [$.28_{adj}$] (.05, .28)	

Note: (a) A conforming answer cannot occur for correct post-event information to an accurate initial answer.

Conforming answers cannot occur for correct post-event information presented to an accurate initial memory. The post-event information type and initial accuracy were therefore combined into a new variable with three levels in the same way as for Study 2. These levels were: correct post-event information presented to an inaccurate answer; misinformation presented to an inaccurate answer; and misinformation presented to an accurate answer. There was a significant effect of this new variable on conforming answers ($\chi^2(2) = 55.72$, $p < .001$). Also shown in Table 24, correct post-event information to an inaccurate item was given with a higher proportion of conforming answers compared with both misinformation to an inaccurate item ($b = -0.98$, $SE_b = 0.38$, $p = .01$) and misinformation to an accurate item ($b = -2.83$, $SE_b = 0.42$, $p < .001$). Misinformation to an accurate item resulted in significantly fewer conforming answers than misinformation to an inaccurate item ($b = 1.86$, $SE_b = 0.46$, $p < .001$).

The interaction between the initial questionnaire type and the new post-event

information type and initial accuracy variable was non-significant ($\chi^2(4) = 1.68$, $p = .79$).

Initial confidence. The initial confidence with which a participant reported their answer significantly affected conforming answers when controlling initial accuracy, and without controlling accuracy. As expected, the initial confidence of an item that became non-conforming ($M = 73.36$ [$M_{adj} = 48.81$], $SD = 34.05$, $95\%\ CI = 58.75, 87.97$) was higher compared with an item that did go on to become conforming ($M = 49.24$ [$M_{adj} = 38.54$], $SD = 33.30$, $95\%\ CI = 33.20, 65.28$). There was no significant interaction between initial confidence and the initial questionnaire type on conforming answers ($\chi^2(2) = 0.35$, $p = .84$).

The interaction between initial accuracy and confidence on conforming answers was non-significant. The three-way interaction between initial accuracy, initial confidence, and the initial questionnaire type on conforming answers was non-significant ($\chi^2(5) = 3.47$, $p = .63$).

Film and post-event information schema. The schema of the film item significantly affected the proportion of conforming answers when controlling initial accuracy and not controlling accuracy. As shown in Table 25, typical film items resulted in a higher proportion of conforming answers compared with atypical items. There was no significant interaction between the film schema and initial questionnaire type on conforming answers ($\chi^2(2) = 2.53$, $p = .28$).

The effect of the post-event information schema on conforming answers was significant. Shown in Table 25, typical post-event information resulted in a higher proportion of conforming answer compared with atypical information, as predicted. The interaction between the post-event information schema and initial questionnaire type on conforming answers was non-significant ($\chi^2(2) = 3.37$, $p = .19$).

Table 25

Proportion of Conforming Answers by Film Schema and Post-Event Information Schema (95% CI)

	Post-Event Information Schema		
Film Schema	**Typical**	**Atypical**	**Total**
Typical	.33 [$.59_{adj}$] (.18, .52)	.12 [$.42_{adj}$] (.05, .25)	.25 [$.56_{adj}$] (.14, .40)
Atypical	.07 [$.21_{adj}$] (.02, .17)	.15 [$.27_{adj}$] (.04, .42)	.12 [$.26_{adj}$] (.03, .27)
Total	.23 [$.49_{adj}$] (.12, .38)	.14 [$.31_{adj}$] (.09, .26)	

The effect of the interaction between the film and post-event information schema's was significant without controlling accuracy. Simple effects analyses were conducted by examining the effect of the post-event information type on conforming answers for typical and atypical film schemas separately. As shown in Table 25, for typical film items typical post-event information resulted in a higher proportion of conforming answers compared with atypical post-event information. For atypical film items there was no significant difference between typical and atypical post-event information. When controlling for initial accuracy the interaction was non-significant ($\chi^2(1) = 1.66$, $p = .20$)

The three-way interaction between the initial questionnaire type, film schema, and post-event information schema on conforming answers was non-significant ($\chi^2(2) = 3.78$, $p = .15$).

Centrality. The effect of centrality on the proportion of conforming answers was non-significant without controlling for accuracy or when controlling for accuracy. The interaction between centrality and the initial questionnaire type on conforming answers was non-significant ($\chi^2(2) = 1.27$, $p = .53$).

The interaction between centrality and the film schema was non-significant without controlling initial accuracy ($\chi^2(1) = 0.01$, $p = .94$) and with controlling accuracy ($\chi^2(1) = 1.25$, $p = .26$).

Final Confidence

Final accuracy. The final accuracy of a participants answer significantly affected the confidence with which that answer was reported ($\chi^2(1) = 96.96$, $p < .001$). As shown in Table 26, inaccurate answers were given with lower mean confidence compared with accurate answers ($b = 30.44$, $SE_b = 2.91$, $p < .001$), as expected.

Conformity status. The relationship between conformity status and final confidence was significant ($\chi^2(1) = 23.08$, $p < .001$). As shown in Table 26, non-conforming answers were given with higher mean confidence compared with conforming answers ($b = -14.16$, $SE_b = 3.79$, $p < .001$), as expected.

Table 26

Mean (SD; 95% CI) Final Confidence by Final Accuracy and Conformity Status

	Final Accuracy		
Conformity Status	**Accurate**	**Inaccurate**	**Total**
Non-Conforming	86.34 (21.54; 80.11, 92.57)	48.05 (32.75; 40.54, 55.56)	75.49 (31.62; 63.79, 87.19)
Conforming	58.84 (29.32; 49.12, 68.56)	58.46 (29.26; 47.86, 69.06)	61.34 (29.08; 48.05, 74.63)
Total	82.34 (24.86; 74.53, 90.15)	51.90 (32.31; 43.25, 60.55)	

This was qualified by the interaction between the conformity status of a participants answer and the accuracy of that answer on final confidence, which was significant ($\chi^2(1) = 29.90$, $p < .001$). Simple effects analyses were conducted by examining the relationship between final accuracy and final confidence for conforming and non-conforming answers separately, and examining the relationship between conformity status and final confidence for accurate and inaccurate final answers separately. Accurate non-conforming answers were reported with higher mean

confidence compared with accurate conforming answers (b = -27.46, SE_b = 3.88, p < .001). Inaccurate non-conforming answers were reported with lower mean confidence compared with inaccurate conforming answers (b = 12.90, SE_b = 6.67, p = .03). Non-conforming inaccurate items were reported with lower mean confidence compared with non-conforming accurate items (b = 37.38, SE_b = 3.14, p < .001). For conforming answers, there was no significant difference between inaccurate items and accurate items (b = -1.62, SE_b = 6.95, p = .41).

Post-event information type. There was no significant effect of post-event information type on final confidence ($\chi^2(1) = 2.03$, p = .15). The interaction with conforming answers was also non-significant ($\chi^2(1) = 0.82$, p = .36).

Discussion

The current discussion will focus on the effect of the initial questionnaire type on initial accuracy and conforming answers. Additionally we will briefly examine the replication of Study 2, specifically the initial memory, the misinformation effect, and the final memory. The replication will be focused on in greater detail during the general discussion in Chapter 7.

Initial Questionnaire Type

The initial questionnaire type affected the initial accuracy of a participants answer as expected. Both multiple-choice recognition tests resulted in higher accuracy than the cued-recall test. Recognition tests allow participants to retrieve items from the memory that are stored below the recall but above the recognition threshold (Sauer et al., 2008). This increases accuracy as participants are able to correctly recognize items when they would be unable to recall them. Additionally, when completing the recognition test participants are able to guess the answer with a higher chance of accuracy than when completing the cued-recall test, as in the current study both recognition tests included the accurate answer. Each recognition test also included a schema-similar item that was not presented in the film, which reduced the chance of the participant correctly guessing the item if they could only remember whether the item was typical or not.

The effect of the initial questionnaire type on initial accuracy was qualified by the interaction with the film schema. For the recognition test that didn't include the misinformation item there was no significant difference between the film schemas, however the misinformation item was replaced in the questionnaire by a new item that was chosen by the researcher. The item was matched to the misinformation schema, however pilot data was not collected on these items therefore we cannot be sure that this recognition test was equivalent to the recognition test with the misinformation.

Nevertheless, the pattern of results was virtually identical for both recognition tests. Significant differences occurred between the recognition and recall conditions rather than between the two recognition conditions.

There was no difference in accuracy for atypical items across the three questionnaires, however typical items were reported with higher accuracy for the two recognition questionnaires compared with the cued-recall test. There is no recognition advantage for atypical items, but there is for typical items. This may be due to atypical items all being stored in the episodic memory strongly enough that they do not fall below the recall threshold. The recall questionnaire would therefore show maximum accuracy with no room for improvement when using a recognition test. In contrast, typical items do show an advantage of recognition over recall. Typical items may be stored below the recall threshold therefore maximum accuracy is only achieved when recognition tests are used, not recall tests.

It was expected that the increase in accuracy for the initial recognition tests would result in a decrease in conforming answers to correct post-event information. Conforming answers can only occur for these items if the initial memory is inaccurate. In Study 2 we showed a trend towards more conforming answers for correct information than misinformation when the initial memory was inaccurate, which we suggested may have been due to recognizing the correct item during the narrative. This would occur when the participant is unable to recall the item and therefore to report it in the initial memory test, but can recognize the item when it is presented. We found no evidence that a recognition test reduces conforming answers, despite the increase in initial accuracy.

The initial questionnaire type did not significantly affect conforming answers with and without controlling for initial accuracy, and there was no interaction with initial accuracy. Additionally the initial questionnaire type did not interact with any of the

predictor variables on conforming answers. The final questionnaire in which conforming answers would be reported were all cued-recall, therefore the differences between questionnaire types would only occur if the initial memory was affecting the answer.

The effect of the post-event information type and initial accuracy variable on conforming answers was significant, with correct post-event information resulting in more conforming answers than misinformation presented to both an accurate or inaccurate initial memory. This did not interact with the initial questionnaire type, therefore the predicted reduction of conforming answers to correct post-event information for the recognition compared with cued-recall tests was not supported. The effect of post-event information type on conforming answers for inaccurate initial items only does not appear to be due to the participants simply recognizing the item in the narrative.

It may be that the context used in the narrative assists in the increased effect of correct information compared with misinformation, with correct item placed within a detailed account of the surrounding items causing the difference between this and misinformation on conforming answers. The recognition test used the same questions as the cued-recall questionnaire with the addition of the multiple-choice options. The information given in the question may not have been detailed enough for the participant to retrieve the item accurately.

To test this in future research, questionnaires with the specific question embedded amongst detailed information could be used to determine if the context in either a recognition or cued-recall questionnaire changes the effect of correct post-event information. Additionally, the level of detail surrounding the post-event information items could be investigated to determine what effect this has on the memory. The different amounts of detail presented during the memory test or post-event information may encourage the participant to recall or recognize accurate items.

The correct item was presented in both recognition tests, however the misinformation was only presented in the recognition test with misinformation. The lack of interaction with the post-event information type and initial accuracy variable demonstrates that the initial presentation of the item neither increased or reduced the effect of the post-event information. Although we predicted a reduction in the effect for correct post-event information this was due to items being reported accurately initially. It is surprising that presenting the items twice, and as a legitimate option initially, did not increase conforming answers for these items. Nevertheless, this is similar to the results of Huff et al. (2013) who found that presenting misinformation either once or four times did not affect conforming answers for a schematic event in a social contagion study.

Memory Prior To The Presentation Of Post-Event Information

The film schema in the current study interacted with the initial questionnaire type on initial accuracy as discussed above, however when looking at the effect for the cued-recall questionnaire only we can see the same pattern of results as Study 2. Atypical items were again reported with higher accuracy than typical items, however there was no interaction with the centrality of the item as there was in Study 2. The centrality again affected initial accuracy, with central items resulting in more accurate answers than peripheral items. The film items affect initial accuracy consistently, showing that the initial memory may not be equal for all items within an event.

The film schema and centrality of items also affected initial confidence when controlling for accuracy, showing that participants believe that central and atypical items are more likely to be correct than peripheral and typical items. Central and atypical items would be highly attended to during the event, also demonstrated by accuracy, and would therefore be easy to retrieve from the memory with accompanying episodic detail. When an item is easy to retrieve from the memory and is very detailed when retrieved,

participants would be more confident that this is an accurate answer.

The Misinformation Effect

The initial accuracy and confidence of the item significantly affected conforming answers, similarly to Studies 1 and 2. Accurate and highly confidence initial items were less likely to result in conforming answers than inaccurate and low confident items. In the current study there was no significant interaction between accuracy and confidence on conforming answers, as there was in Study 2. As discussed in Study 2, the effects of accuracy and confidence on conforming answers may be due to increased discrepancy detection for these items. That is, participants may detect and reject the misinformation more easily if their initial memory is accurate and highly confident. Discrepancy detection will be the focus of Study 4, where an examination of which items participants are more likely to detect as discrepancies will be carried out. Furthermore, how this detection affects conforming answers and the final memory report will also be addressed.

The film and post-event information schemas both affected conforming answers, but the interaction was non-significant when controlling initial accuracy. This contrasts with Study 2 where the interaction was significant. In both studies typical post-event information resulted in conforming answers, however in Study 2 this was only the case for typical film items. As typical film items also resulted in more conforming answers than atypical film items in the current study, we can see that overall the pattern of results is similar. Typical post-event information and typical film items do result in more conforming answers than atypical film items and post-event information. This would occur as typical items are more likely to be assessed as a potentially accurate answer by participants, as these items are in line with their expectation of what should have happened during the event. Participants are therefore more likely to accept typical items and reject atypical items. Furthermore, typical items reinforce the schema and may be

incorrectly retrieved from semantic memory during the memory test.

Final Accuracy and Conformity Status on Final Confidence

The final confidence of an item was affected by an interaction between the accuracy and conformity status of that item. There was no difference in confidence between accurate and inaccurate conforming answers, and these were lower than for accurate non-conforming items and higher than inaccurate non-conforming items. When maintaining an accurate answer from the initial to final memory tests (an accurate non-conforming answer) the participant is highly confident that this item is accurate. The item may be easily retrieved from the memory with episodic detail, causing the participant to believe that it is correct. In contrast, maintaining an inaccurate item from the initial to final memory tests results in the lowest confidence. These may be items where the participant cannot retrieve an item but does not believe that the post-event information is the accurate answer.

No difference between the accurate and inaccurate conforming answers shows that participants are equally confident when reporting correct post-event information or misinformation. Despite more conforming answers for correct post-event information, participants were not more confident that these items are accurate. This may indicate that the participant conforms to correct post-event information without suddenly recognizing that it is accurate, and being confident that they have been able to identify to correct answer for that item. The higher conforming answers for correct post-event information may therefore be due to a more subtle recognition of the accurate item, rather than a sudden recognition that this item is correct. This will be further investigated in Study 4 when examining discrepancy detection, by asking participants what they thought about the discrepant item when they detected it.

Chapter 6

Study 4: Discrepancy Detection Within A Schematic Misinformation Paradigm

The aim of Study 4 was to determine whether participants can detect discrepancies between the film and the narrative, and whether this discrepancy detection is driven by film and post-event information schemas and post-event information type. The focus of this study was concerned with two separate issues: the first is a replication of Study 2 with the addition of a condition where participants answer questions about the narrative, and the second focuses on discrepancy detection.

Final Questionnaires About The Film And Narrative

In the current study, two final questionnaires were used; participants were asked to provide answers about either the film or the narrative. The condition where participants were asked about the film is essentially a replication of Study 2. New to the current study is a condition where participants were questioned about their memory of the narrative (rather than the film).

The rationale behind using two separate final memory tests, that is, a between-subjects design instead of a standard source monitoring test is two-fold. Firstly, the final film questionnaire is identical to the other studies presented in this thesis, therefore we can compare the results between these studies. The final narrative questionnaire, although asking about a different source, is also in the same format as other final questionnaires in this thesis and is also therefore partially comparable. Secondly, a standard source monitoring test does not help answer the question of whether participants can directly report the post-event misinformation when asked. A modified test where participants are asked for both the film and narrative answers would of course fulfill this requirement, but

again would not leave us with a questionnaire comparable to the other studies presented here.

Accuracy in the final narrative questionnaire could occur for several reasons, and will be best interpreted in comparison with the final film questionnaire. Participants would report an accurate answer if they are successful in monitoring the source of their memory and therefore report the narrative answer in both conditions. They would also report an accurate answer if they can only recall the item from the source they are asked about; that is, the narrative item in the final narrative questionnaire. A comparison of the critical items in each final questionnaire would show us whether participants are able to report one source more accurately than the other, and where these inaccuracies are occurring. In conjunction with a discrepancy detection questionnaire, to be discussed in detail below, we will be able to determine why participants believe they are reporting answers in a particular way.

When answering the final narrative questionnaire, participants have an advantage in that the source of the information is more recent than for participants answering about the film. Items that are more recent may be more easily retrieved from the memory regardless of which source participants are asked about. Since the sources are essentially about the same episode and participants would read the narrative with the film in mind, we may find no advantage of one questionnaire type over the other. This would occur if the items are encoded into the memory as a part of the same episode without differentiating between the sources. If they are encoded as separate episodes, or with the sources as a part of the items, we will expect participants to easily differentiate between sources for both final questionnaires which would result in high accuracy.

Reporting the post-event information when asked about the film is referred to in this thesis as a conforming answer. As discussed above, participants are meant to report

the post-event information when asked about the narrative. A new term will encompass these items to differentiate which questionnaire the participant is answering and whether they are meant to use the post-event information. *Correct narrative answers* are the same as conforming answers, such that both indicate that the participant reported the post-event information. However, in some analyses it makes more sense to consider an item in terms of when the participant reports the wrong item. This will be referred to as *incorrect narrative answers* and are similar to conforming answers in that this is not what the participants should report.

When correct post-event information was presented to an accurate initial item a conforming answer could not occur, as no change in memory report could occur due to the post-event information. Correct narrative answers were scored in a similar manner: participants needed to change their memory report to reflect the post-event information. This was due to the inability of these measures to determine what effect the correct post-event information had on an accurate initial memory, as the items were the same. Therefore, similar to the analyses on conforming answers, analyses on correct narrative answers were conducted without initially accurate items to which correct post-event information was presented.

The Effect Of Post-Event Information On The Final Questionnaires

When answering the final narrative questionnaire the film schema should not affect correct narrative answers. Participants should not be using their memory of the film to answer the questionnaire, therefore the film items should not affect the answers. The post-event information is likely to affect correct narrative answers, because individuals should be using this source to get the correct answer. The post-event information schema relates to the final narrative questionnaire in a similar way to the film schema and the initial questionnaire; it is the schema of the items that may affect how participants

respond. Since this is not the same task as the initial questionnaire (which may be affected by the film schema), the post-event information schema may act more similarly to the post-event information on conforming answers, or may have a separate effect altogether. The effect of the post-event information scheme on correct narrative answers is therefore exploratory.

The post-event information type may affect correct narrative answers and is expected to affect conforming answers. When answering the final narrative questionnaire, both types of post-event information should affect correct narrative answers similarly, as both would be the correct answer. Differences in correct narrative answers would indicate that one type of post-event information affects the memory differently to the other. This is an exploratory analysis to determine if there are differences in post-event information types for both final questionnaires.

The centrality of the items should affect correct narrative answers due to heightened attention and therefore increased accuracy for central compared with peripheral items. The effect of centrality on correct narrative answers would occur if participants attend more highly to the central than peripheral items and are therefore able to recall them when asked during the questionnaire. Conversely, participants may attend more highly to peripheral items in order to supplement their initial memory, as these items are less likely to be initially accurate. The effect of centrality on correct narrative answers is therefore also exploratory.

Discrepancy Detection

There are many methods for testing a participant's memory for an event, and the source of their memory. One of the more popular of these is a source monitoring test. The basis of a source monitoring test is to determine the exact source of a participants memory, for example determining if the memory is from the film or written narrative.

However due to the way that source monitoring tests are conducted, there is little comparability between an initial memory and final (source monitoring) test. Additionally the participant is made aware of the discrepancies through the use of the test. Where it is important that the initial and final memory tests are highly similar and we do not wish to immediately alert the participant to discrepancies, a discrepancy detection test can be used.

One way that a discrepancy detection test can be applied, such as in the current study, is by putting the participant through a usual initial and final test format such as used previously in this thesis, but then including a separate test to quantitatively and qualitatively query the participants memory. We do this by asking the participant for all items they can remember from multiple sources, while also requesting them to report the source. This gives us the benefit of the participant needing to identify the source of the item rather than being presented with it. We are also able to collect more detailed information from the participant through the use of qualitative items which gives us rich information on the experience of participating in a misinformation study.

Discrepancy detection occurs when participants notice differences between the original event and the post-event information. When the participant detects a discrepancy they should reject this is incorrect from the original source and therefore not report this. Loftus (1979) showed that participants do not report blatantly discrepant items during a memory test and Blank (1998) found that participants were able to report discrepancies between the event and the misinformation. When the misinformation is blatantly discrepant, participants may reject this at the time of attention, therefore not reproducing it during the memory test. If they accept the misinformation however, they may still able to detect the discrepancy during the testing phase and reject it then.

Hence, there are two time points where participants may detect a discrepancy:

During encoding or during retrieval. If the discrepancy is detected whilst reading the narrative the participant is able to reject it then and may not encode it into the memory, therefore when they are specifically asked about the narrative they may not be able to recall the item. If they detect the discrepancy during recall they also need to be able to recall the source of at least one item to be able to decide between the items for reporting. The accuracy rates during the final questionnaire may indicate when discrepancy detection is occurring. If the narrative questionnaire results in lower accuracy compared with the film questionnaire it would show that participants are rejecting the item whilst reading it and cannot later recall it. Higher accuracy for the narrative questionnaire would show that participants are detecting the discrepancy whilst reading it but are recalling it from that source. No differences in accuracy would suggest that participants are able to recall both items, either with or without the source.

When discrepancies between the film and narrative were detected, participants needed to choose how to answer the final questionnaire. Participants were asked how they chose an item when a discrepancy occurred. This was an open ended question and participants were able to report any strategy they believed they used. From this, we should be able to determine if there are a few common strategies used, or if participants use a wide variety of strategies.

Participants were asked about why they thought that discrepancies occurred between the film and the narrative. This is similar to the process histories reported by Blank (1998) in regards to a similar question participants were asked regarding how they reconciled differences between the sources. In contrast to Blank (1998), we asked participants to report overall histories instead of for every discrepancy. Asking participants for their thoughts about discrepancies had two main aims: we firstly wished to explore how differences in these process histories affect conforming answers and final

accuracy across the questionnaires, and secondly to determine if participants in the current study reported similar process histories to those found by Blank (1998).

Discrepancy Detection And The Initial Memory

The initial memory of the participant will play a role in discrepancy detection. When the memory is accurate there is no discrepancy with correct post-event information but there is with misinformation. An inaccurate memory may be discrepant with both types of post-event information, however the discrepancy is of a different nature as the participant cannot report the accurate answer. When the participant is able to recall the accurate item they may compare this with the narrative whilst reading it, which would then lead detecting discrepancies. An inaccurate memory may not be compared, or participants may believe that their memory is inaccurate and that no discrepancy actually exists.

Confidence may also affect discrepancy detection, as differences between the post-event information and the memory would be stronger for more confident items. It is unlikely that participants would strategically compare every item in the narrative to their memory of the film, as both are relatively long and complex. A general comparison would occur, with participants potentially closely examining items which jump out as different, which would occur for stronger memory items more than weak items. Specifically, if an item is easily retrieved from the memory it is likely to be reported with high confidence, and would also be more likely to be retrieved when a discrepant item occurs during the narrative. A low confident item may not be retrieved and compared with the narrative. We would therefore expect that confidence would play a role in discrepancy detection with higher confident items resulting in more discrepancies than less confident items.

The hypothesis regarding the effect of the initial memory on discrepancy detection is:

1. The initial accuracy and confidence of an item will affect whether a discrepancy is detected for that item. Accurate and highly confident initial answers will result in a higher proportion of detected discrepancies compared with inaccurate and less confident initial answers.

Differences In Discrepancy Detection Due To Schemas And Post-Event Information

Different types of items may be easier to detect as discrepancies than others. Blatantly contradictory items, as described by Loftus (1979) are more easily detected as discrepant than items that aren't blatantly contradictory, but what makes an item more or less blatant? In the current study, typical and atypical film and post-event information items were used, and atypical items may be more blatantly contradictory than typical items and therefore detected more often. As the film contains several atypical items, however, it may be that the post-event information schema interacts with the film schema on discrepancy detection. If the post-event information schema affects discrepancy detection without interaction with the film schema it would be expected that typical items are detected less than atypical items. If an interaction occurs however it would be expected that a post-event information item presented to the same schema film item would be detected less than when it is presented to the other schema.

The type of post-event information may also affect discrepancy detection. Contradictory misinformation is truly discrepant from the film, and correct post-event information is not. When the participants initial memory was inaccurate, all post-event information was discrepant with this. Participants would therefore detect discrepancies without being able to report the accurate answer. If correct post-event information and contradictory misinformation affected the memory differently, there would be differences in the discrepancies detected between these. As shown in Study 3, correct post-event information resulted in more conforming answers than misinformation for initially

inaccurate memories. If this is replicated in the current study, this would occur due to correct post-event information being detected as different from the participants initial memory, but accepted as the correct item more than misinformation. The examination of the post-event information type on detected discrepancies was therefore exploratory.

The relevant hypothesis for the effect of the schema on detected discrepancies is:

2. The film and post-event information schema will interact in their effect on detected discrepancies. When the schema of the post-event information is the same as the schema of the film item a lower proportion of detected discrepancies will be detected compared with items where the film and post-event information schemas are different.

Discrepancy Detection And Conforming Answers

Discrepancy detection is expected to affect conforming answers for the final film questionnaire, but may not affect correct narrative answers for the final narrative questionnaire. When answering the final film questionnaire participants should reject discrepant items as they are asked to report the memory of the film. Unless the participant has no memory of the film and reported a guess with very low confidence they should maintain their initial answer. An inaccurate item, if retrieved from the memory, is still the participants memory of the film regardless of its accuracy. When the participant has guessed an initial item they may report the post-event information as there is no discrepancy between the post-event information and a non-existent memory. Items that are detected as discrepant should therefore not be reported as a conforming answer with a higher proportion of conforming answers for items that are not detected as discrepant.

When answering the final narrative questionnaire participants are meant to be reporting the narrative items. Detecting a discrepancy may affect correct narrative items if participants attend highly to discrepant items therefore being able to retrieve them more

easily at a later date. If they do not detect a discrepancy, however, they may still report without realizing that there was a difference between sources. If detecting a discrepancy is important to be able to later report the discrepant item we would find that detected discrepancies result in a higher proportion of correct narrative answers compared with items that aren't detected.

The hypothesis regarding the effect of discrepancy detection on conforming and correct narrative answers is:

3. Conforming answers (final film questionnaire) and correct narrative answers (final narrative questionnaire) will be affected by detected discrepancies. For items where a discrepancy is detected there will be lower proportions of conforming answers but a higher proportion of correct narrative answers, compared with items for which a discrepancy is not detected.

Method

Participants

Forty-three participants from Flinders University, South Australia (30 Female, 12 Male) with a mean age of 22.62 years (*SD* = 5.47) took part for course credit or $25 reimbursement for their time. All participants spoke English as their first language.

Design

Each session was randomly allocated to one of two film conditions. Within each session participants were randomly allocated to one of four narratives per film (eight in total), which included both correct post-event information or misinformation. Participants were randomly allocated to one of two final questionnaire conditions, one with the same instructions as Study 3, and one instructing them to complete the questionnaire with answers from the narrative.

Once the final questionnaire was completed, participants were asked to complete the discrepancy detection questionnaire, before being debriefed.

Materials

Films. The same two films from Study 3 were used, which was approximately 5 minutes long showing a stylized house break-in. Each film had 9 critical scenes which were either typical or atypical, varied between the two film versions.

Post-Event Narratives. The same post-event narratives were used as from Study 3. These contained 14 paragraphs, 9 of which referred to the critical items. The 9 critical items were either correct post-event information or misinformation (typical and atypical). After each paragraph the participants were asked about their perceived confidence of the author as shown in Appendix 6.

Maze Task. Five mazes of varying difficulty were given as a timed filler task. The

task was designed so that it could not be completed in the allocated 5 minutes. Participants were told they had to complete as many of the mazes as possible.

Initial Questionnaire. The initial cued-recall questionnaire contained 18 questions, 9 which referred to the critical items and 9 filler items. This was the same initial questionnaire as used in Study 2 and the cued-recall condition of Study 3. Participants were required to give an answer and a confidence rating of between 0 and 100% for each question with ratings in 10% increments.

Final Questionnaires. Two final cued-recall questionnaires were used. The questions and confidence ratings for both questionnaires were identical to the initial questionnaire. The instructions on the film questionnaire directed participants to answer from their memory of the film, whilst the narrative questionnaire asked participants to answer from their memory of the narrative.

Debrief Sheet. A debrief sheet, shown in Appendix 11, was given to participants. The debrief sheet outlined some problems with memory and some aims of the study. This provided a preamble for the discrepancy detection questionnaire, and was given to stimulate participants into thinking about the aims and nature of the study.

Discrepancy Detection Questionnaire. A series of questions were asked regarding the experience of taking part in the study. Participants were asked to report any items that they remembered differing between the film and narrative. They had two chances to do this, firstly as a free-recall task, and secondly with the aid of their final questionnaire. Participants were also asked to report why they thought the discrepancies occurred, and how they chose which item to report when there was a discrepancy. The questionnaire is given in Appendix 12.

Procedure

Participants initially watched the film, which was followed immediately by the

initial questionnaire. The participants then read the narrative, answering the embedded questions as they went. Next participants were timed for 5 minutes while they attempted the maze (filler) task. The final memory questionnaire immediately followed the maze task. Once the final memory questionnaire had been completed participants were given the debrief sheet and asked to read it through immediately. The participants were then given the discrepancy detection questionnaire and asked to work through it. Finally participants were fully debriefed and reimbursed for their time.

Scoring

Conforming Answers and Correct Narrative Answers. Both conforming answers and correct narrative answers refer to the participant reporting the post-event information during the final questionnaire. When answering the final film questionnaire the misinformation was inaccurate, but when answering the narrative questionnaire this was accurate.

For conforming or correct narrative answers to occur, the participant must change their response from the initial to the final questionnaire, with the final answer reflecting the post-event information. This could occur for both initially accurate and inaccurate items to which misinformation was presented. When correct post-event information was presented, however, an accurate initial answer would be the same as the post-event information; therefore a conforming answer could not be given. This means that conforming and correct narrative answers can only be given to correct post-event information when the initial answer was inaccurate.

Detected Discrepancies. Reported discrepancies from question one of the discrepancy detection questionnaire were scored for each item. That is, for each of the nine critical items in the study each item was given a discrepancy score. The ratings were as follows:

1) No correct discrepancy: The participant either did not report a discrepancy, or reported an incorrect discrepancy for this item
2) Correct discrepancy: The participant correctly identified the discrepancy. When the initial answer was accurate and correct post-event information was presented, a correct discrepancy could occur if the participant reported that the post-event information was different to their initial answer due to some small difference in the reporting of the items.

Answer Choice. Question four of the discrepancy detection questionnaire asked participants how they chose an answer to report for the discrepant details. Answers were categorized into four areas:

- Always chose the film item
- Always chose the narrative item
- The most confidently remembered item
- A combination of both the film and narrative

The reported answer choice did not always reflect the instructions that participants were given, and they answered this question before referring back to the final questionnaire.

Process History. Each participant was able to justify their choice of answer qualitatively in the discrepancy detection questionnaire. There were no limits on the types of answers participants could report. Content analysis was conducted on these qualitative answers and they were scored as per Blank's (1998) process histories. It was decided to use pre-existing coding for comparability with Blank's results, but also because these are sensible codes that encompass each of the answers participants were expected to, and indeed did, report.

The process histories outlined in Blank (1998), and used in the current study, are:

1) Doubting own memory: Where the participant reports that they were unsure about their memory of the item either while reading the post-event narrative or whilst trying to recall the item for the final questionnaire
2) Interpretation as:
    a. Mistake: The discrepancy was due to an error made by the person writing the post-event narrative
    b. Method: The discrepancy was placed in the narrative on purpose, for some unknown (or guessed) purpose
    c. Deception: The discrepancy was placed there as a lie by the researchers
3) Sure memory: The participant was sure of their memory and didn't realize there was a discrepancy, or was sure that they were correct but didn't rationalize the discrepancy
4) Other/unclassifiable: Any other reason

Additional Scoring

The following measures were also taken from the discrepancy detection questionnaire but are not reported in the following Results section due to the large overlap with the measures already outlined. Reasons for not being analyzed are given with each measure.

Discrepancy Time. This is the first time point in the study that participants reported noticing a discrepancy. The possible times that discrepancies could be were: during the narrative, during the final questionnaire, during the debrief, or during the discrepancy detection questionnaire. All participants reported noticing at least one discrepancy whilst reading the narrative, therefore only one score was given to any participants for this measure.

Final Questionnaire Discrepancies. Participants were able to refer to their final

questionnaire to recognize any questions where a discrepancy may have occurred. This was scored in the same way as the detected discrepancies. This item was not used as the majority of accurate discrepancies were the same as for the measure of detected discrepancy however more inaccurate discrepancies were reported.

Study Aims. We asked participants to report what they thought the aim of the study was. This measure was not used as participants reported similar responses to the process histories, with the addition of reporting that they believed this was a memory study. As the questionnaires used in this study made it clear that we were testing memory so this was not considered to be a useful addition to the results.

Results

The initial analyses reported focus on replication of results from Study 2 and 3. In addition to the replication, half of the participants completed a final questionnaire about the post-event narrative rather than the film. The replication results are presented in several subsections: First, the memory prior to the post-event information was examined; next, conforming and correct narrative answers were considered; next, the differences between the final questionnaires are looked at; lastly, final confidence is examined.

Secondly, the effect of discrepancies on conforming answers will be considered followed by an examination of when discrepancy detection occurs. We will then examine the strategies participants use to answer the questionnaire, before finally considering participant's process histories of why the discrepancies occurred (Blank, 1998).

Memory Prior To The Presentation Of The Post-Event Information

Film schema on initial accuracy. The accuracy of the participant's initial answer was not significantly affected by the schema of the film item ($\chi^2(1) = 2.27$, $p = .13$). When presented with a typical film item (.47, *95% CI* = .38, .57) there was no significant difference in initial accuracy compared with an atypical film item (.67, *95% CI* = .46, .82).

Centrality on initial accuracy. The centrality of the item significantly affected the proportion of accurate initial answers ($\chi2(1) = 38.72$, $p < .001$). The proportion of accurate answers for peripheral items (.77, 95% CI = .67, .83) was lower than for central items (.95, 95% CI = .89, .98); b = -1.79, SEb = 0.30, $p < .001$.

The interaction between centrality and the film schema on initial accuracy was non-significant ($\chi^2(1) = 0.07$, $p = .79$).

Initial accuracy on initial confidence. There was a significant relationship between initial accuracy and initial confidence ($\chi^2(1) = 105.66$, $p < .001$). As expected,

inaccurate answers (*M* = 39.37, *SD* = 32.17, *95% CI* = 33.71, 45.03) were reported with lower mean confidence compared with accurate answers (*M* = 78.03, *SD* = 27.53, *95% CI* = 72.63, 83.43); *b* = 38.66, SE_b = 3.91, *p* < .001.

The Misinformation Effect

Participants completed the final questionnaire about either the film or post-event narrative. The final film questionnaire is a replication of Studies 2 and 3, while the final narrative questionnaire is new to this study. The term *conforming answer* will continue to be used for the final film questionnaire, where participants change their answer to reflect the post-event information despite being asked about the film. When asked about the narrative however this becomes the correct answer, which will be described as a *correct narrative answer*. Each analysis in the current section will be separated into two parts, one for each of the questionnaire conditions.

The descriptive statistics for each of the main effects analyses are given in Table 27, separated by the final questionnaire type. Table 28 shows each analysis with and without controlling for initial accuracy and confidence, and are also separated by final questionnaire type. Where the subscript "adj" is used, the statistic is adjusted by initial accuracy.

Table 27

Proportions of Conforming Answers (95% CI) or Mean (SD;95% CI) Confidence, by Final Questionnaire Type for Each Reported Analysis

		Final Questionnaire Type	
		Film	**Narrative**
Initial Accuracy	Accurate	.24 (.11, .45)	.40 (.24, .57)
	Inaccurate	.49 (.35, .63)	.41 (.28, .55)
Initial Confidence	Conform	33.83 [27.26_{adj}] (26.98; 21.77, 45.89)	47.30 [32.86_{adj}] (33.76; 35.80, 58.80)
	Non-Conform	56.82 [46.08_{adj}] (36.51; 46.39, 67.25)	63.15 [48.31_{adj}] (29.63; 53.63, 72.67)
Post-Event Information Type	Correct Post-Event Information	.54 [$.54_{adj}$] (.34, .72)	.45 [$.45_{adj}$] (.28, .64)
	Misinformation	.34 [$.44_{adj}$] (.12, .68)	.38 [$.35_{adj}$] (.14, .69)
Post-Event Information Type and Initial Accuracy	Initially Inaccurate - Correct Post-Event Information	.54 (.34, .72)	.45 (.28, .64)
	Initially Inaccurate - Misinformation	.44 (.27, .63)	.35 (.18, .56)
	Initially Accurate - Misinformation	.24 (.11, .45)	.40 (.24, .58
Film Schema	Typical	.49 [$.59_{adj}$] (.33, .65)	.51 [$.50_{adj}$] (.35, .66)
	Atypical	.33 [$.38_{adj}$] (.10, .68)	.28 [$.27_{adj}$] (.07, .62)
Post-Event Information Schema	Typical	.49 [$.57_{adj}$] (.33, .64)	.53 [$.53_{adj}$] (.37, .69)
	Atypical	.33 [$.41_{adj}$] (.10, .68)	.27 [$.26_{adj}$] (.07, .62)
Centrality	Central	.44 [$.87_{adj}$] (.17, .75)	.54 [$.59_{adj}$] (.23, .81)
	Peripheral	.49 [$.70_{adj}$] (.15, .84)	.74 [$.80_{adj}$] (.37, .93)

Table 28

Effect of Initial Accuracy and Confidence, Post-Event Information Type, Film and Post-Event Information Schema, and Centrality on Conforming Answers With and Without Initial Accuracy and/or Initial Confidence Controlled

		Final Film		Final Narrative	
Predictor	Variables controlled	$\chi^2(1)$	*b* (*SE*)	$\chi^2(1)$	*b* (*SE*)
Initial Accuracy	None	7.38, p = .007	-1.09 (0.53), p = .04	0.01, p = .93	-0.04 (0.45), p = .93
Initial Confidence	None	10.91, p < .001	-24.99 (7.18), p < .001	4.29, p = .04	-15.85 (7.47), p = .02
	Initial accuracy	7.21, p = .007	-18.82 (6.76), p < .001	5.74, p = .02	-15.45 (6.34), p < .001
Post-Event Information Type	Neither	2.70, p = .10	-0.80 (0.48), p = .09	0.46, p = .50	-0.31 (0.45), p = .49
	Initial accuracy	0.52, p = .47	-0.41 (0.55), p = .46	0.58, p = .44	-0.44 (0.56), p = .43
	Initial confidence	0.82, p = .36	-0.49 (0.52), p = .35	0.00, p = .99	0.01 (0.48), p = .99
	Both	0.38, p = .54	-0.38 (0.59), p = .52	0.48, p = .49	-0.40 (0.58), p = .48
Film Schema	Neither	2.12, p = .15	-0.68 (0.33), p = .13	4.25, p = .04	-0.97 (0.45), p = .03
	Initial accuracy	3.11, p = .08	-0.85 (0.48), p = .07	4.32, p = .04	-1.00 (0.46), p = .03
	Initial confidence	1.81, p = .18	-0.68 (0.50), p = .17	2.59, p = .11	-0.77 (0.46), p = .09
	Both	2.75, p = .10	-0.87 (0.52), p = .09	2.74, p = .10	-0.81 (0.47), p = .08

Table 28 Continued

		Final Film		Final Narrative	
Predictor	Variables controlled	$\chi^2(1)$	*b* (*SE*)	$\chi^2(1)$	*b* (*SE*)
Post-Event Information Schema	Neither	2.12, *p* = .15	-0.67 (0.45), *p* = .14	5.72, *p* = .02	-1.13 (0.46), *p* = .01
	Initial accuracy	1.87, *p* = .17	-0.65 (0.47), *p* = .17	5.73, *p* = .02	-1.14 (0.46), *p* = .01
	Initial confidence	3.14, *p* = .08	-0.91 (0.51), *p* = .07	5.85, *p* = .02	-1.14 (0.47), *p* = .01
	Both	2.43, *p* = .12	-0.82 (0.52), *p* = .11	6.63, *p* = .01	-1.23 (0.48), *p* = .01
Centrality	Neither	0.17, *p* = .68	-0.20 (0.48), *p* = .68	3.40, *p* = .07	-0.87 (0.46), *p* = .06
	Initial accuracy	3.02, *p* = .08	-1.07 (0.64), *p* = .09	3.93, *p* = .05	-1.00 (0.49), *p* = .04
	Initial confidence	1.62, *p* = .20	-0.74 (0.57), *p* = .20	4.75, *p* = .03	-1.05 (0.48), *p* = .03
	Both	3.17, *p* = .07	-1.22 (0.71), *p* = .09	3.67, *p* = .06	-0.96 (0.50), *p* = .06

Initial accuracy. There was a significant effect of initial accuracy on conforming answers for the final film questionnaire. Inaccurate items were reported with a higher proportion of conforming answers compared with accurate items. There was no significant effect of initial accuracy on correct narrative answers for the final narrative questionnaire.

Initial confidence. Initial confidence was significantly related to conforming answers for the final film questionnaire with and without controlling for initial accuracy. Items where non-conforming answers were reported had higher mean initial confidence compared with items that where conforming answers were reported.

There was a significant effect of initial confidence on correct narrative answers for the final narrative questionnaire when controlling for initial accuracy. Incorrect narrative answers were reported with lower mean initial confidence compared with correct narrative answers.

There was no significant interaction between initial accuracy and confidence on conforming answers for the final film questionnaire ($\chi^2(1) = 1.65$, $p = .20$), or on correct narrative answers for the final narrative questionnaire ($\chi^2(1) = 2.43$, $p = .12$).

Post-event information type. There was no significant effect of post-event information type on conforming answers for the final film questionnaire (Table 28). There was also no significant effect of post-event information type on correct narrative answers for the final narrative questionnaire.

Film schema. The effect of the film schema on conforming answers was non-significant whether initial accuracy was or wasn't controlled, shown in Table 28. When presented with a typical film item, there was no significant difference in the proportion of conforming answers compared with atypical film items.

Shown in Table 28, the effect of the film schema on correct narrative answers was significant for the final narrative questionnaire even after controlling for initial accuracy. A higher proportion of correct narrative answers was given when participants were presented with a typical compared with atypical film item.

There was no significant interaction between the film schema and centrality on conforming answers for the final film questionnaire ($\chi^2(1) = 0.13$, $p = .72$), or on correct narrative answers for the final narrative questionnaire ($\chi^2(1) = 0.63$, $p = .43$).

Post-event information schemas. The post-event information schema did not significantly affect conforming answers for the final film questionnaire (Table 28). There was a significant effect of post-event information schema on correct narrative answers

for the final narrative questionnaire. Typical post-event information items resulted in a higher proportion of correct narrative answers compared with atypical post-event information items.

The interaction between the film and post-event information schemas on conforming answers was non-significant for the final film questionnaire ($\chi^2(1) = 0.28$, $p = .59$). The interaction was also non-significant on correct narrative answers for the final narrative questionnaire ($\chi^2(1) = 0.14$, $p = .71$).

A new variable for post-event information type and initial accuracy was created in the same way as Studies 2 and 3. This variable had three levels: an inaccurate initial answer to which correct post-event information was presented; an inaccurate initial answer to which misinformation was presented; and an accurate initial answer to which misinformation was presented. This variable was significantly related to providing conforming answers for the final film questionnaire ($\chi^2(1) = 7.90$, $p = .02$). There was no significant difference in the proportion of conforming answers between correct post-event information presented to an inaccurate answer and misinformation presented to an inaccurate answer ($b = -0.41$, $SE_b = 0.55$, $p = .46$). There was also no significant difference in conforming answers between misinformation presented to an accurate item and to an inaccurate initial item ($b = 0.88$, $SE_b = 0.60$, $p = .14$). However, participants who were initially accurate and then were presented with misinformation reported a lower proportion of conforming answers compared with those who were presented with correct post-event information following an inaccurate initial response ($b = 1.28$, $SE_b = 0.59$, $p = .03$).

Centrality. There was no significant effect of centrality on conforming answers for the final film questionnaire. There was a significant effect of centrality on correct narrative answers for the final narrative questionnaire when controlling initial accuracy,

and this was borderline significant without controlling accuracy as shown in Table 27. Peripheral items resulted in a higher proportion of correct narrative answers compared with central items.

There was no significant effect of the new variable of post-event information type and initial accuracy on correct narrative answers for the final narrative questionnaire ($\chi^2(2) = 0.59$, $p = .74$).

Final Questionnaire Type

Final accuracy. The final questionnaire type did not significantly affect final accuracy ($\chi^2(1) = 0.35$, $p = .55$). The final film questionnaire (.58, *95% CI* = .48, .67) resulted in no significant difference in final accuracy as the final narrative questionnaire (.53, *95% CI* = .29, .70); $b = -0.17$, $SE_b = 0.28$, $p = .55$.

Conforming and incorrect narrative answers. There was no significant effect of the final questionnaire type on conforming and incorrect narrative answers ($\chi^2(1) = 0.62$, $p = .43$). Participants who answered the final film questionnaire (.30, *95% CI* = .23, .40) gave no significant difference in conforming answers compared with incorrect narrative answers for the final narrative questionnaire (.26, *95% CI* = .13, .45); $b = -0.23$, $SE_b = 0.29$, $p = .43$.

Final Answer Confidence

Similarly to the initial memory measures, the two questionnaire types were considered together in their effects on final confidence. For each analysis the interaction with the questionnaire types is presented. Where we consider conforming answers we are also using correct narrative answers, which is displayed in the text as *conformity (correct narrative answer) status*.

Final questionnaire type. There was no significant effect of the type of final questionnaire on final confidence ($\chi^2(1) = 0.85$, $p = .36$). There was no significant

difference in mean final confidence between the final film questionnaire (*M* = 67.65, *SD* = 32.05, *95% CI* = 61.16, 74.14) and the final narrative questionnaire (*M* = 71.83, *SD* = 28.55, *95% CI* = 57.55, 86.11); $b = 4.18$, $SE_b = 4.54$, $p = .18$.

Conformity status. The conformity (correct narrative answer) status did not significantly affected mean final confidence ($\chi^2(1) = 0.00$, $p = .99$). There was no significant difference in mean final confidence between conforming and non-conforming answers ($b = 4.73$, $SE_b = 4.00$, $p = .12$).

The interaction between conformity status and the final questionnaire type however was significant ($\chi^2(1) = 11.60$, $p < .001$), shown in Table 29. Simple effects analyses were conducted examining the effects of conformity (correct narrative answer) status on mean final confidence for the final film and narrative questionnaires separately. When answering the final film questionnaire, non-conforming answers resulted in higher mean final confidence compared with conforming answers ($b = -12.35$, $SE_b = 6.38$, $p = .03$). When answering the final narrative questionnaire, incorrect narrative answers were reported with a lower mean final confidence compared with correct narrative answers ($b = 15.16$, $SE_b = 5.06$, $p = .002$).

Table 29

Final Mean (SD; 95% CI) Confidence by Final Questionnaire Type and Conformity (Correct Narrative Answer) Status

	Conformity (Correct Narrative Answer) Status	
Final Questionnaire Type	**Non-Conform (Incorrect)**	**Conform (Correct)**
Film	71.24 (32.15; 63.51, 78.97)	59.45 (31.19; 47.51, 71.39)
Narrative	64.23 (30.78; 52.65, 75.81)	78.48 (24.57; 62.54, 94.42)
Total	72.53 (31.66; 66.74, 78.32)	67.79 (28.30; 62.26, 73.32)

Final accuracy. The final accuracy of an item significantly affected the mean final

confidence of an answer ($\chi^2(1) = 34.70$, $p < .001$). In Table 30, we can see that inaccurate answers are reported with lower mean final confidence compared with accurate answers ($b = 23.20$, $SE_b = 3.69$, $p < .001$).

The interaction between final accuracy and the final questionnaire type on mean final confidence was significant ($\chi^2(1) = 7.40$, $p = .007$), shown in Table 30. Simple effects analyses were conducted by running the analysis of final accuracy on final confidence for the final film questionnaire. Final accuracy is the same as correct narrative answer status for the final narrative questionnaire which was reported previously. For the final film questionnaire, inaccurate answers were reported with lower mean final confidence compared with accurate answers ($b = 32.35$, $SE_b = 5.18$, $p < .001$).

Final accuracy and conformity (correct narrative answer) status did not significantly interact in their effects on mean final confidence ($\chi^2(1) = 0.04$, $p = .83$).

Table 30

Mean (SD; 95% CI) Final Confidence by Final Accuracy and Final Questionnaire Type

	Final Accuracy		
Final Questionnaire Type	**Accurate**	**Inaccurate**	**Total**
Film	81.42 (24.68; 71.04, 91.80)	49.11 (31.74; 40.69, 57.53)	67.65 (32.05; 61.16, 74.14)
Narrative	78.51 (24.57; 67.07, 89.95)	64.20 (30.78; 49.68, 78.72)	71.83 (28.55; 57.55, 86.11)
Total	80.15 (24.56; 75.22, 85.08)	56.95 (31.93; 51.47, 62.43)	

Post-event information type. The effect of post-event information type on final mean confidence was non-significant ($\chi^2(1) = 2.04$, $p = .15$), with no significant difference in final mean confidence for answers following correct post-event information ($M = 72.50$, $SD = 30.94$) compared with answers following misinformation ($M = 67.05$, $SD =$

29.57); b = -5.45, SE_b = 3.81, p = .09. The interaction with final questionnaire type was also non-significant ($\chi^2(1) = 1.55$, p = .21).

Discrepancy Detection

The analyses conducted on detected discrepancies, including the relationship with conforming and correct narrative answers, did not include initially accurate items to which correct post-event information was presented because discrepancies did not exist for these items.

Discrepancy Detection for the Final Questionnaires

Final questionnaire type. There was no significant effect of questionnaire type on the proportion of discrepancies detected ($\chi^2(1) = 0.10$, p = .75) for participants who answered the final film questionnaire (.38, *95% CI* = .25, .51) or the final narrative questionnaire (.35, *95% CI* = .12, .67); b = -0.13, SE_b = 0.40, p = .74.

Accuracy and post-event information type. Initial accuracy significantly affected the proportion of recalled discrepancies ($\chi^2(1) = 20.16$, $p < .001$) as predicted. Shown in Table 31, inaccurate answers resulted in lower rates of reported discrepancies compared with accurate answers (b = 1.63, SE_b = 0.38, $p < .001$).

The post-event information type significantly affected the proportion of detected discrepancies ($\chi^2(1) = 7.99$, p = .005) as predicted. As shown in Table 31, when the participants were presented with correct post-event information the proportion of detected discrepancies was lower compared with misinformation (b = 1.08, SE_b = 0.39, p = .005).

Table 31

Proportion of Detected Discrepancies by Initial Accuracy and Post-Event Information Type (95% CI)

	Post-Event Information Type		
Initial Accuracy	**Correct Post-Event Information**	**Misinformation**	**Total**
Accurate	NA	.59 (.41, .72)	.58 (.41, .72)
Inaccurate	.20 (.11, .35)	.27 (.12, .49)	.21 (.13, .32)
Total	.21 (.11, .35)	.44 (.21, .69)	

The variable of initial accuracy and post-event information type was used from the analysis on conforming answers in Study 4A. This variable had three levels: Correct post-event information presented to an inaccurate initial answer, misinformation presented to an inaccurate initial answer, and misinformation presented to an accurate initial answer. There was a significant effect of the initial accuracy and post-event information type variable on detected discrepancies ($\chi^2(2) = 16.25$, $p < .001$). Shown in Table 31, there was no significant difference in the proportion of detected discrepancies between initially inaccurate answers to which correct post-event information or misinformation was presented ($b = 0.40$, $SE_b = 0.48$, $p = .40$). Initially accurate item to which misinformation was presented resulted in a higher proportion of conforming answers compared with correct post-event information presented to an inaccurate initial item ($b = -1.77$, $SE_b = 0.45$, $p < .001$) and misinformation presented to an inaccurate initial item ($b = -1.37$, $SE_b = 0.44$, $p = .002$).

Initial confidence. The effect of initial confidence on detected discrepancies was non-significant whether accuracy was not controlled for ($\chi^2(1) = 2.82$, $p = .09$) or was ($\chi^2(1) = 0.00$, $p = .98$).

Film and post-event information schemas. The proportion of discrepancies reported by participants was not significantly affected by the schema of the film item ($\chi^2(1) = 2.00$, $p = .16$), with no significant difference in discrepancies between typical (.31, *95% CI* = .20, .42) and atypical film items (.42, *95% CI* = .30, .56); $b = 0.49$, $SE_b = 0.33$, $p = .14$. There was also no significant effect of the post-event information schema on detected discrepancies ($\chi^2(1) = 0.05$, $p = .82$), with no significant difference between typical (.36, *95% CI* = .24, .48) and atypical post-event information (.37, *95% CI* = .17, .64); $b = 0.08$, $SE_b = 0.33$, $p = .82$.

A new variable of the schema match was created with two levels: match between the film and post-event information schema, and mismatch between the film and post-event information schema. There was a significant effect of schema match on discrepancy detection ($\chi^2(1) = 4.22$, $p = .04$), with the matched film and post-event information schema (.30, *95% CI* = .20, .42) resulting in a lower proportion of detected discrepancies than a mismatched film and post-event information schema (.48, *95% CI* = .21, .75); $b = 0.77$, $SE_b = 0.36$, $p = .03$.

The interaction between the schema match and the post-event information schema on detected discrepancies was non-significant ($\chi^2(1) = 2.09$, $p = .15$).

Centrality. The centrality significantly affected detected discrepancies ($\chi^2(1) = 6.29$, $p = .01$), with central items (.51, *95% CI* = .35, .67) resulting in a higher proportion of detected discrepancies compared with peripheral items (.28, *95% CI* = .11, .54); $b = -1.00$, $SE_b = 0.37$, $p = .007$. When controlling for the effects of initial accuracy, however, this is not significant ($\chi^2(1) = 1.55$, $p = .21$).

The Role Of Discrepancies In The Misinformation Effect

There was a significant relationship between detected discrepancies and conforming answers for the final film questionnaire ($\chi^2(1) = 9.25$, $p = .002$), and between

detected discrepancies and correct narrative answers for the final narrative questionnaire ($\chi^2(1) = 11.91$, $p < .001$). As shown in Table 32, a greater proportion of conforming answers for the final film questionnaire were reported when participants detected a discrepancy compared to when they did not detect a discrepancy ($b = 1.41$, $SE_b = 0.48$, $p = .003$). Similarly, a greater proportion of correct narrative answers resulted when a discrepancy was detected compared with no detected discrepancy ($b = 1.16$, $SE_b = 0.47$, $p = .01$).

Table 32

Conforming and Correct Narrative Answers by Final Questionnaire Type and Discrepancy Detection (95% CI)

	Detected Discrepancies	
Final Questionnaire Type	**Detected**	**None Detected**
Film	.61 (.43, .76)	.27 (.18, .43)
Narrative	.58 (.40, .74)	.30 (.20, .44)

The interaction between initial accuracy and detected discrepancies on conforming answers was non-significant for the final film questionnaire ($\chi^2(1) = 1.61$, $p = .20$), or on correct narrative answers for the final narrative questionnaire ($\chi^2(1) = 1.63$, $p = .20$).

Post-event information type and initial accuracy. The interaction between discrepancy detection, and the post-event information type and initial accuracy variable on conforming answers was not significant for the final film questionnaire ($\chi^2(2) = 0.88$, $p = .64$), or on correct narrative answers for the final narrative questionnaire ($\chi^2(2) = 0.48$, $p = .79$).

Answer Choices Strategies

The following analyses are run on conforming answers and *incorrect* narrative answers. The proportion of conforming or incorrect narrative answers per participant was calculated without initially accurate items to which correct post-event information was presented. Each participant reported one strategy as to how they chose and item when there was a discrepancy, which were: using the film to answer, using the narrative to answer, using confidence to answer, or using a combination of these three. Analyses of variance were conducted in SPSS to determine the relationship with conforming and incorrect narrative answers.

The relationship between answer choice strategy and conforming answers was non-significant ($F(3,37) = 0.41$, $p = .75$), as was the effect of final questionnaire type ($F(1,37) = 2.41$, $p = .13$). The interaction between answer strategy and final questionnaire was significant ($F(3,37) = 5.56$, $p = .003$), with the proportion of conforming (incorrect narrative) answers, shown in Table 33.

Simple effects analyses were conducted by comparing the final questionnaire types on conforming answers for each of the answer choice strategies, using t-tests. When participants answered using a film strategy, significantly fewer conforming or incorrect answers were reported for participants who answered the film than the narrative questionnaire ($t(10) = -2.45$, $p = .03$). When using a narrative strategy, significantly fewer conforming or incorrect narrative answers were reported for the narrative than the film questionnaire ($t(5) = 3.72$, $p = .01$). There were no significant differences between the film and narrative questionnaires on the proportion of conforming answers for the strategies of using confidence ($t(7) = 1.08$, $p = .32$), or a combination ($t(15) = 0.91$, $p = .38$).

Table 33

Proportion of Conforming (Incorrect Narrative) Answers by Final Questionnaire Type and Answer Choice Strategy, and the Proportion of Participants Reporting that Answer Choice (95% CI)

	Final Questionnaire			
Answer Choice Strategy	**Film**	**Narrative**	**Total**	**Participants Reported**
Film	.11 (-.17, .39)	.51 (.35, .67)	.41 (.21, .67)	.27
Narrative	.75 (.41, 1.09)	.14 (-.08, .30)	.31 (.15, .47)	.16
Confidence	.47 (.27, .66)	.28 (.00, .56)	.40 (.23, .57)	.20
Combination	.39 (.25, .54)	.28 (.09, .48)	.36 (.24, .48)	.37
Total	.41 (.29, .53)	.34 (.23, .45)		

Process History

To analyze the relationship between each process history and conforming answers, the proportion of conforming answers from the total number of answers per participant was used. Participants were able to report as many process histories as they wished[8], which covered the reasons why they thought discrepancies occurred between the film and narrative, and were: doubting their own memory, a mistake being made, the method, deception by the researcher, and being sure of their own memory. In addition a category of other/unclassifiable was used to cover any answers not able to be categorized. Two-way analyses of variance were run in SPSS to determine if either the main effects or interactions with final questionnaire type were significant. The interaction with questionnaire type was run to ensure that this manipulation did not cause differences in

[8] Participants could report more than one process history; the results displayed are the average proportion of conforming answers for those participants only who reported that process history, versus those who did not report that process history.

the way participants thought about the overall study. None of the interactions were significant, and are reported in Table 34 with the proportion of conforming answers when participants did or did not report each process history, and the total proportion of participants who reported each process history.

There was no significant relationship between the following process histories and conforming answers: Doubting their own memory ($F(1,39) = 0.41$, $p = .53$), the method ($F(1,39) = 1.18$, $p = .28$), deception ($F(1,39) = 0.67$, $p = .42$), and sure of own memory ($F(1,39) = 0.43$, $p = .52$).

There was a significant relationship between the process history of a mistake and conforming answers ($F(1,39) = 3.98$, $p = .05$), with participants who did not report the history having a higher proportion of conforming answers compared with participants who did report the process history.

Table 34

Proportion of Conforming (Incorrect Narrative) Answers by Process History and Report Status, the Proportion of Participants to Report the Process History, and the Interaction with Final Questionnaire Type (95% CI[1])

Process History	Non-Reported	Reported	Interaction with Final Questionnaire Type	Participants
Doubting Own Memory	.45 (.27, .64)	.40 (.30, .49)	F(1,39) = 1.30, *p* = .26	.56
Mistake	.47 (.36, .58)	.26 (.12, .40)	F(1,39) = 0.66, *p* = .42	.23
Method	.40 (.30, .50)	.55 (.25, .86)	F(1,39) = 0.57, *p* = .45	.16
Deception	.44 (.30, .54)	.34 (.06, .62)	F(1,39) = 0.76, *p* = .39	.19
Sure Memory	.43 (.33, .53)	.67 (.00, .88)	F(1,39) = 0.95, *p* = .34	.12
Other/Unclassifiable	.40 (.31, .49)	.90 (.00, 1.00)	F(1,39) = 0.10, *p* = .75	.05

Discussion

The final film questionnaire in the current study is a replication of Studies 2 and 3, but the final narrative questionnaire is new to this study. An in-depth discussion of the replication results will be presented in Chapter 7, the General Discussion. This will include the discussion of initial accuracy, and initial and final confidence. Finally, the discussion will address the issue of discrepancy detection.

Replication of Study 2 and Narrative Questionnaire Condition

Final Questionnaire Type. Participants were not told what the final questionnaire would be asking them about until they received it. Any differences between questionnaire conditions must therefore have arisen whilst answering the final questionnaire. There was no difference in final accuracy between the two final questionnaires indicating that participants are equally likely to report inaccurate answers regardless of whether they were answering about the film or the narrative. Additionally, there was no difference in conforming and incorrect narrative answers between the final questionnaires showing that participants are equally likely to report the item from the wrong source for both questionnaires.

The final confidence that participants reported for an item was affected by the conformity (correct narrative) answer status and the final questionnaire type. Specifically, when answering the final film questionnaire, non-conforming answers resulted in higher confidence than conforming answers, similarly to Studies 1 and 2. Participants are more confident in an answer they have maintained throughout the study, than in a conforming answer. The opposite effect was shown for the final narrative questionnaire, where participants were more confident in correct narrative answers (i.e. reporting the post-event information) than in an incorrect narrative answer. Participants are therefore more confident in an answer when it is from the correct source (or for the film questionnaire,

maintained from the initial test) than when it is from the incorrect source (or for the narrative questionnaire, maintained from the initial test). This indicates that participants are attempting to answer from the correct source and are more confident when doing so. Additionally, participants were able to monitor their confidence when answering from both sources, rather than confidence being linked to one of the sources.

Initial Accuracy and Confidence for Conforming and Correct Narrative Answers. The initial accuracy of an item was significantly related to whether a conforming answer was reported for that item. Items that were initially accurate resulted in fewer conforming answers than inaccurate items. When answering the final narrative questionnaire the initial accuracy of an item did not significantly affect correct narrative answers. This shows that both initially accurate and inaccurate items are attended to during the narrative, or they would not be reported in the narrative questionnaire. In regards to conforming answers, participants therefore must reject the post-event information more frequently when they are initially accurate compared with when they are inaccurate as they appear to have attended to the post-event information in both cases.

The initial confidence with which an answer was reported was also significantly related to conforming answers and to correct narrative answers. Items that became non-conforming were reported with higher initial confidence than conforming items. For the final narrative questionnaire, for items associated with incorrect narrative answers (i.e., the participant reported the film item) the initial confidence was higher than for correct narrative answers. That is, high confidence resulted in participants reporting the film item in both the film and narrative questionnaires. This would indicate that participants who are initially highly confident are more likely to maintain their initial answer regardless of whether they are meant to. The lower initial confidence of conforming answers may therefore not be due to a strategic decision to reject the post-event information, but due

to a natural maintenance of the initial answer.

Post-event information type for Conforming and Correct Narrative Answers. Correct post-event information and misinformation to inaccurate initial items resulted in similar proportions of conforming answers. Additionally, the only significant comparison was between the correct post-event information presented to an inaccurate initial answer and misinformation presented to an accurate initial answer. The initial accuracy of the item and not the post-event information type affects conforming answers when using cued-recall questionnaires, showing that when the participant is initially inaccurate they cannot differentiate between correct post-event information and misinformation. There was also no effect of post-event information type and initial accuracy on correct narrative answers. It was expected that participants would report both types of post-event information equally when asked about the narrative, as both are the accurate item to report on the final narrative questionnaire.

Schemas for Conforming and Correct Narrative Answers. The film and post-event schemas did not affect conforming answers individually and there was no significant interaction. However, both main effects were significant for correct narrative answers, although there was no significant interaction. Typical film items and typical post-event information both resulted in higher proportions of correct narrative answers compared with atypical film items and atypical post-event information. Typical post-event information would be reported with more correct narrative answers as typical items are more easily accepted compared with atypical items. This shows that even if participants detect more atypical post-event information, they report the typical items more often despite being asked to report the post-event information. This will be further investigated in part B, where a more detailed examination of discrepancy detection is undertaken.

The effect of film schemas on conforming and correct narrative answers shows that participants are most likely to change their answer to the post-event information when the film item was typical. This is not explained by the initial accuracy or confidence, which were both controlled for. When the initial memory is for a typical film item, the participant may detect fewer discrepancies between the sources as the film item is similar to their expectation of the event. This may then lead to participants accepting the post-event information and reporting this during the final questionnaire. This will also be investigated further in part B.

Centrality for Conforming and Correct Narrative Answers. The centrality of items did not affect conforming answers when controlling for accuracy, however central items resulted in fewer correct narrative answers compared with peripheral items. The difference in results between the film and narrative questionnaires shows that participants are able to report peripheral post-event information items with higher accuracy when specifically asked about these, however are able to reject them when asked about the film. This differs compared with the literature (e.g. Dalton & Daneman, 2006) where peripheral items were found to produce a greater misinformation effect compared with central items. As participants have attended to peripheral items and are able to report them during the final narrative questionnaire, it shows that these items are also being rejected when answering the film questionnaire to result in no difference on conforming answers. It was expected that participants would attend highly to central items during the narrative and also report these with high proportions of correct narrative answers, which was not supported. If participants are attending to the central items highly they must be rejecting them for both the film and narrative questionnaires. Alternatively, due to the high initial accuracy for central items, participants may not attend to these items during the narrative as they are sure of their memory.

Discrepancy Detection

The discussion of the discrepancy detection results is in several sections. The first section examines when discrepancy detection occurs whereas the second looks at conforming and correct narrative answers in regards to items for which discrepancies were detected. Next we consider how participants chose an answer when discrepancies were detected, and finally the process histories, as per Blank (1998), are looked at.

When Discrepancy Detection Occurred. Participants were exposed to misinformation between the film and the narrative before receiving their final questionnaire and being instructed on how to answer this. There was no significant difference in detected discrepancies between participants who answered each of the questionnaires as we would expect considering the methodological conditions. Until participants received the final questionnaire there were no major methodological differences between participants (except the counterbalancing of items), so as the discrepancies occurred before this point, no difference in detection was expected. Participants did not detect any additional discrepancies whilst undertaking the final film questionnaire, which is where the majority of memory monitoring should have occurred. When answering about the film participants needed to disregard their memory of the most recent stimuli and rely on memory encoded earlier in the session. This would require more monitoring than answering about the most recent stimuli, but also did not lead to additional detected discrepancies.

Participants who answered the final film questionnaire did not detect more discrepancies than participants who answered the final narrative questionnaire. This suggests that discrepancy detection occurs during the narrative and that additional monitoring to report film items does not enhance discrepancy detection. This is supported by the answers to one of the discrepancy questions, which asked participants to report

when they noticed the first discrepancy. As discussed in the method this measure was not analyzed as participants all reported noticing at least one discrepancy whilst reading the narrative.

The accuracy of the participants answer and the type of post-event information presented affected detected discrepancies. Misinformation was detected most often when the initial memory was accurate, and both correct post-event information and misinformation to inaccurate initial answers resulted in similar lower proportions of detected discrepancies. An accurate initial memory is often also strong and vivid, and would therefore result in the participant noticing differences between their memory and the post-event information more easily. The difference between an accurate memory and the new information would be greater than the difference between an inaccurate memory and the post-event information.

Detecting a discrepancy when the initial memory is inaccurate is different to detecting a discrepancy when the memory is accurate, because even though the participant has correctly identified a discrepancy they still cannot report the correct answer. This occurs for correct post-event information and misinformation, but the participant would not be able to identify which applies. Discrepancy detection can therefore occur regardless of whether the participant can report the accurate item, meaning that detecting a discrepancy may not reduce a misinformation effect even when participants are specifically attempting to do so.

As participants detected discrepancies in all three accuracy and post-event information type conditions we can see that they are attending to the narrative whether their memory is accurate or inaccurate. This supports the idea that participants will attend to schematic information in the narrative, but importantly shows that the lower misinformation effect for accurate items is due to participants rejecting the

misinformation in many cases instead of simply not attending to it.

The schema effect on detected discrepancies showed that the post-event information schema did not significantly affect discrepancies, but the match between the film and post-event information schemas did. That is, atypical post-event information was not more likely that typical information to be detected, but both were detected more when the film schema was different than when it was the same. This indicates that post-event information of the opposite schema to the film is more blatant than information of the same schema, but that the actual post-event information schema does not affect this. This may have occurred because several atypical items were included in the film therefore atypical post-event information itself was not considered surprising. Additionally, it may be that the memory of the item plays a greater role in discrepancy detection than the schema.

Schema atypical items may seem blatantly contradictory, however this may depend on the number of atypical items included in the original event. Central items would also be considered blatant, however the results showed that centrality only affected discrepancy detection through initial accuracy. Loftus (1979) found that blatantly contradictory misinformation resulted in fewer overall conforming answers, which were attributed to increased monitoring due to this item. Hekkanen and McEvoy (2005) suggested that discrepancy detection would occur for atypical items more easily than typical items, and that detected discrepancies would result in fewer conforming answer. Using added misinformation however means that the event may not have any atypical items incorporated which would then make the atypical items stand out more from the post-event information. In the current study the event contained several atypical items, as did the post-event narrative. From the detected discrepancies it would seem that under these conditions it is in fact the match of the schema at an item level that affects detection.

We have also discussed that detecting discrepancies results in an increase in conforming answers compared with items that a discrepancy is not detected for.

The schema of both the film and post-event information items affected conforming answers, with typical items resulting in more conforming answers than atypical items for both schemas. There was no interaction between the film and post-event information schemas on conforming answers, but there was on discrepancy detection. The matched schema resulted in fewer detected discrepancies than the mismatched schema. Typical matched items are therefore accepted more often but detected less often than atypical matched items, whilst mismatched items are detected and rejected. The degree of discrepancy between matched items is less than for mismatched items, however in the current study this was not linked to the specific schema.

When a Discrepancy was Detected. When participants who answered the final film questionnaire detected a discrepancy, they were more likely to give a conforming answer than when they did not detect a discrepancy. This is counterintuitive if participants are following the instructions. Participants should reject the item from the incorrect source, and should answer with the same item they gave in the initial questionnaire. Participants should only report the misinformation if they believe that this was what they saw in the film, that is, if they believe that there is no discrepancy between the sources. The process histories, however, show us that many participants doubted their own memories. They may have believed that their initial memory was inaccurate and that the post-event information was correct. This may have lead participants to accept some of the discrepant items as correct therefore leading them to report these.

Detected discrepant items may also result in higher rates of conforming answers because the participant must encode the post-event information to be able to report this later. If participants are not monitoring their memory, they may recall the strongest item

from the memory which may be the most recently encoded item. This would most likely reflect a source monitoring error. When a discrepancy is not detected the participant may have either encoded the item without realizing it was discrepant, or did not encode the item. When the item was not encoded, it could not be retrieved from the memory, therefore conforming answers could not occur.

Discrepancy detection did not significantly affect correct narrative answers for participants who answered the final narrative questionnaire. This shows that participants who did not detect a discrepancy were equally likely to report the narrative item as those that did detect this discrepancy. The lack of effect of detected discrepancies on correct narrative answers demonstrates that participants don't always detect discrepant items even when they are able to recall them. This supports the idea that some post-event information is encoded into the memory without the participant detecting the discrepancy. Discrepant items are detected more often for accurate initial answers, however inaccurate initial answers in the final film questionnaire resulted in more conforming answers. In the final narrative questionnaire there are items for which the participant reported the discrepancy but did not answer with the narrative item, therefore also supporting the idea that participants did not follow the instructions.

The difference between final questionnaire types on conforming and correct narrative answers for detected discrepancies shows that different processes are occurring for each questionnaire. This would be expected as they are different tasks, therefore participants should be answering the questionnaire differently and we should see different patterns. The difference between final questionnaire types can be summarized into two main areas: task demands, and instruction biases. The demand on participants answering the film questionnaire may be harder than for participants answering the narrative questionnaire, as one source has occurred more recently than the other. This may make it

easier to recall items from the narrative than from the film.

Instruction biases and misunderstanding the instructions may have affected how participants answered the questions differently for each of the questionnaires. Although there were no differences in terms of process histories between the two final questionnaire types, this does not conclusively show that participants in both conditions had the same beliefs about what the researcher wanted. For example, if participants believed that they were just doing a series of memory tests they may have reported their memory for the most recent source without considering the instructions, which would have resulted in more correct narrative answers but also more conforming answers. In contrast, believing that the film was the most important source as that the narrative was just there to sway or change the memory may have caused participants to report fewer conforming answers but also fewer correct narrative answers. These different biases would therefore have affected the questionnaires in different ways.

Answer Choice Strategy. Participants were asked how they decided which item to use when they detected a discrepancy between the film and the narrative. This was a free-report question with no indication of what participants should report, however the answers fell into four categories: using the film, narrative, their confidence, or a combination. The reported answer strategies did not always match the instructions given for the final questionnaire. Often participants reported using items from the source other than the one they were asked to answer with. For example, someone who was asked about the film in the final questionnaire may have reported using the narrative to answer.

The way that participants chose to answer the questionnaires significantly interacted with the questionnaire type on conforming and incorrect narrative answers. When participants reported using the film to answer they reported fewer conforming answers to the final film questionnaire compared with incorrect narrative answers to the

final narrative questionnaire. Similarly, using the narrative to answer resulted in fewer incorrect narrative answers compared with conforming answers. This stands to reason, as using the incorrect source will lead to inaccurate answers when the source items are different. When participants reported using whichever item they were most confident in, or a combination of the film, narrative, and their confidence there were no differences in conforming and incorrect narrative answers. Participants were equally as likely to report the answer from the wrong source.

Two main issues are demonstrated by the answer choices reported by participants: Firstly, some participants do not follow instructions and may knowingly report information from the wrong source and, secondly, that even when using the correct source, some participants report incorrect answers. Neither issue is a new phenomena in misinformation research, with warning about using the correct source often resulting in a reduction in misinformation reported (see e.g., Blank & Launey, 2014). Warnings, however, do not eliminate a misinformation effect and this may be due to participants believing they are using the correct source. Source-monitoring within the misinformation paradigm has also shown a reduction in the overall misinformation effect, however this also demonstrates participants attributing items to the incorrect source.

Testing participants memory of the instructions could help indicate why participants reported using the incorrect source to answer questions. It may be that participants incorrectly assumed what they were meant to be doing and therefore used the wrong source without checking the instructions. To test this we could specifically ask participants to recall the questionnaire instructions after these have been removed, or include within the instructions something for the participants to do to indicate that they had read these. For example they could be asked to circle one of the question numbers if they had read the instructions.

Although participants not actually reading the instructions despite being asked to do so may cause participants to use the wrong source, it may also be that they chose to use that source for a different reason despite knowing what they were meant to do. If participants didn't realize that the discrepancies between the sources were a problem and a potential source of errors they may have decided to use the source that was easiest for them, whether this was the most recent source (the narrative) or one they had already been tested on (the film). This is where using warnings about the difference in sources could be useful to encourage participants to use the correct source when they are inclined to use the other one.

Participants also reported using the item that they were most confident in, or a combination of sources and confidence. When using the most confident item the participant is leaving themselves open to errors as this does not take into account the source they are meant to be using. Using a combination strategy similarly leaves participants open to making source errors. That these strategies were reported by participants indicates that they were unsure how they should have been answering the questionnaires, but also shows that they were able to recall items from both sources and had to decide between them. When using only one source to answer the participant may not be making a selection between multiple items, however using whichever item the participant retrieved most confidently or a combination shows that they are able to retrieve multiple items. When participants do retrieve multiple items warnings about discrepancies may help them make a decision on which to report; source monitoring warnings would also alter the participants method of recalling and reporting the answer and would therefore also increase accuracy.

Source monitoring errors are occur when they participants attributes the item to the incorrect source or cannot identify the source. Here we have an additional problem,

participants can report discrepant items even when they cannot report the accurate answer. If participants are asked about the film and know that the item they have retrieved is from the narrative they should be able to correctly identify the source, however if they are presented with the accurate item they still may not be able to identify that as the correct answer or the source of the item. In contrast to when participants are able to retrieve multiple items and need to select one, warnings and source monitoring instructions may not be of any help to increase accuracy for items where a discrepancy is detected but the accurate answer is unknown.

Process Histories. The process histories in the current study were coded the same way as Blank (1998), and showed a similar pattern of results. Only one of these items was significantly related to conforming and incorrect narrative answers, that of the participants reporting the discrepancy was a mistake. When reporting this process history fewer conforming and incorrect narrative answers were given than for this process history not being reported. Believing that the discrepancy is a mistake therefore leads to participants rejecting this item.

The final questionnaire type was not related to any of the process histories and did not interact with any in the effect on conforming and incorrect narrative answers. Participants believed that the discrepancies occurred for similar reasons regardless of which questionnaire they were asked to complete. As discussed above, the discrepancies occurred before participants were given the final questionnaires, therefore this indicates that participants determined these process histories whilst reading the narrative and before they were given the final questionnaire.

The process histories can help us understand the participants acceptance or rejection of discrepancies in a broad, but not item specific, sense. Participants often reported doubting their own memory therefore they may have been more likely to accept

the post-event information as correct, attributing the discrepancy to their own faulty initial memory. This was a correct assumption in many cases, participants did report discrepancies when their initial memory was inaccurate. Participants also reported being sure of their own memory, although this happened in fewer cases than doubting their memory. This was also correct in many cases as participants did detect discrepancies when their initial memory was accurate and misinformation was presented. These items should have been rejected as incorrect for participants who answered the final film questionnaire, however there was no significant effect of this process history on conforming and incorrect narrative answers showing that participants did accept these items incorrectly.

There were three main categories regarding how participants believed the discrepancies came to be in the narrative, that were related to the narrative instead of their memory. Participants reported that the discrepancies were the method or a specific deception more often than they attributed them to a mistake. This may have been due to the large number of discrepancies between the sources which made it less likely that these were a mistake. When participants thought that the discrepancy was due to the researcher (either the method or deception) the participants did not always reject the item. Participants may have strategically reported the discrepancy as they thought it was a part of the study, or may have rejected it if they thought this is what was needed. Not enough information was given for these motivations to be completely understood. Future research could utilize an interview method to further probe participants for information on their thought processes surrounding what they thought of the instructions, how they chose to answer, and why discrepancies occurred.

Chapter 7: General Discussion

The focus of the current thesis was on the effect of schemas within a misinformation paradigm. This was considered in the context of how the initial memory affected conforming answers, as well as how the type of post-event information played a part in the overall process. To aid in understanding the results across the studies and the replicability of findings, a summary of the results on conforming answers is shown in Table 35. This will be referred to within the following sections.

Schema Effect On Initial Memory

In Study 1, we used typical, atypical, and irrelevant film and post-event information items, however irrelevant items were not considered in the subsequent studies. These were removed since they appeared to work differently compared with the relevant items, and relevant items were the main focus in this thesis. Specifically, irrelevant items differed on conforming answers between added and contradictory misinformation, where the relevant items did not. Much work has been conducted on irrelevant items within a misinformation paradigm, therefore, when examining typical and atypical items, it was deemed sensible to focus on these to the exclusion of irrelevant items. Furthermore, from a controlled design perspective, irrelevant post-event information can only be presented to irrelevant film items and as a consequence, these could not be counterbalanced within the stimuli set created for the final three studies in this thesis.

Table 35

Overview of Results on Conforming Answers by Study, for Initial Accuracy and Confidence, Film and Post-Event Information Schema, Post-Event Information Type, and Centrality

	Study 1	**Study 2**	**Study 3**	**Study 4**	
				Film	**Narrative**
Initial Accuracy	*p* < .001 Accurate < Inaccurate	*p* < .001 Accurate < Inaccurate	*p* < .001 Accurate < Inaccurate	*p* = .007 Accurate < Inaccurate	*p* = .93
Initial Confidence	*p* < .001 Non-conform > Conform	*p* < .001 Non-conform > Conform	*p* = .001 Non-conform > Conform	*p* = .007 Non-conform > Conform	*p* = .02 Incorrect > Correct
*Initial Accuracy * Confidence*	*p = .92*	*p* = .04 Accurate: Non-conform > Conform Inaccurate: Non-conform > Conform	*p* = .11	*p* = .20	*p* = .12
Film Schema	*p* = .73	*p* = .24	*p* < .001 Typical > Atypical	*p* = .08	*p* = .04 Typical > Atypical
PEI Schema	*p* = .88	*p* = .02 Typical > Atypical	*p* = .05 Typical > Atypical	*p* = .17	*p* = .02 Typical > Atypical
*Film * PEI Schema*	*p* = .43	*p* = .07 Film Typical: Typical > Atypical Film Atypical: No sig. difference	*p* = .20	*p* = .59	*p* = .71
PEI Type	*p* < .001 with correct post-event information, *p* = .25 without	*p < .001* Correct PEI > Misinformation	*p = .008* Correct PEI > Misinformation	*p = .20*	*p = .44*

Table 35 Continued

	Study 1	Study 2	Study 3	Study 4	
				Film	Narrative
*PEI Type * Initial Accuracy*	NA	*p < .001* Initial Accurate Misinformation < Initially Inaccurate Misinformation = Initially Inaccurate Correct PEI	*p < .001* Initial Accurate Misinformation < Initially Inaccurate Misinformation < Initially Inaccurate Correct PEI	*p = .02* Initial Accurate Misinformation = Initially Inaccurate Misinformation Initially Inaccurate Misinformation = Initially Inaccurate Correct PEI Initial Accurate Misinformation < Initial Inaccurate Correct PEI	*p = .74*
Centrality	NA	*p* = .63	*p* = .12	*p* = .68	*p* = .05 Central < Peripheral

The film schema affected initial accuracy in Studies 1 and 2, interacted with the questionnaire type in Study 3, but had no effect in Study 4. Even when using the same films, the schema of the film item appeared to affect the initial memory inconsistently. The results in Studies 1 and 2 were in opposite directions although there was no significant effect in Study 1. The actual event and choice of items may have impacted upon the way that the schema affected the initial memory. Although the disparity between Studies 1 and 2 can be partially attributed to the problems associated with the item choice in the first study, this highlights issues with item selection that can impact on the results. In the literature, a variety of stimuli have been used and the event may have the major influence on the findings. For example, Huff et al. (2013) and Roediger et al. (2001) used

the same stimuli set but different critical items. Both studies found a similar pattern of results for expectancy on false recall, despite differing findings in relation to conforming answers. Similarly, Study 1 presented in this thesis used the same event as that of Maras and Bowler (2011) and both showed higher accuracy for typical compared with atypical items despite one using the film and the other slides from the film.

The different pattern of findings for the film schema on accuracy may be due to the questionnaire types used. In the literature on schematic misinformation, several different test types have been used, although these were for a final memory test and rarely for an initial memory test. In Study 3, typical items were associated with more accurate answers when using a recognition test, but fewer accurate answers when using a cued-recall test. The effect of the film schema on cued-recall accuracy was the same as for Study 2. We did not specifically test the effect that different memory test types have on conforming answers, but when using schematic items the differences in accuracy may extend to conforming answers as well. That is, typical or atypical items may be easier to report accurately for different test types, thereby affecting when participants give a conforming answer.

The centrality of items also causes variance in the effect of the film schema on initial accuracy. In Study 2, there was an interaction between centrality and the film schema, with no difference in initial accuracy between peripheral typical and atypical items, but higher accuracy for central atypical compared with typical items. There was no interaction for Studies 3 and 4, but the centrality did again affect initial accuracy. Central items are highly attended to and are reported with high accuracy, as are atypical items when using a cued-recall test. When examining the effects of the film schema on initial accuracy the centrality of items is not usually taken into consideration. Using the bank robbery film from Study 1 as an example, central items would be those of the actions and

appearance of the robbers, whilst environmental items would be peripheral. We used items in both categories, as did Maras and Bowler (2011), however centrality was not taken into account in either study. Roediger et al. (2001) used environmental items, whereas Luna and Migueles (2009) used a mix of action, appearance, and environmental items.

Despite the inconsistent pattern of results of the film schema on initial accuracy, atypical items consistently resulted in higher initial confidence than typical items when using the new film. This is despite no difference in initial recollection or familiarity judgments for the film schema, suggesting that participants retrieved typical and atypical items with similar episodic and semantic cues. Participants must therefore be more confident when reporting an atypical items due to the items itself, and not the way in which it is retrieved from the memory. Atypical items would be surprising, and stand out within a mainly typical event. Participants therefore attend to them highly, as discussed in regards to accuracy. When retrieving the memory of these items participants may believe that to retrieve an atypical item it must be accurate, otherwise they would not have remembered it. That is, by retrieving a memory of an atypical item participants may believe it is more likely to be accurate, as it is not something they would naturally think of if they didn't have a memory of it.

Schema Affect On Conforming Answers

The effect of schemas on conforming answers was inconsistent through the four studies presented in this thesis. Study 1 showed no effects of either the film or post-event information schemas, and no interaction. This also happened in Study 4 when examining the final film questionnaire. In contrast, Study 3 showed that typical film items and typical post-event information both resulted in more conforming answers than atypical items and post-event information, with no significant interaction. This pattern of results was also

shown for participants answering the final narrative questionnaire in Study 4. Study 2 was the only study that showed a significant interaction between the film and post-event information schemas.

Although the effects were not all significant, the data trends were in a similar direction for Studies 2, 3, and 4. Typical post-event information to a typical film item resulted in more conforming answers for Study 2, and trended this way for the latter two studies. This however became non-significant when controlling for initial accuracy, whereas the effect of the post-event information schema remained significant. This suggests that the film schema affects conforming answers primarily through the initial accuracy of an item, whereas the post-event information schema affects the memory separately. This explains some variance within the literature, with few findings taking the initial accuracy into account. If the film item is affecting the initial memory in different ways, such as described previously, this would then affect conforming answers in different ways.

Discrepancy detection provides an explanation of the interaction between the film and post-event information schemas on conforming answers. As shown in Study 4, participants detected fewer discrepancies for items where the schemas were matched, rather than mismatched. When a discrepancy is not detected, participants may still be able to retrieve the post-event information item, which resulted in more correct narrative answers for both typical film items and post-event information. Therefore, participants are accepting the post-event information as accurate and as the *same* as the original event (i.e. not a discrepancy), and are then reporting this as the film item. Atypical post-event information to an atypical film items similarly results in fewer detected discrepancies. Atypical items would be rejected as implausible, with the discrepancy likely to be not detected when participants know that the film item was the same schema.

The recollection and familiarity measures from Study 2 also give us an indication as to why an effect of schema on conforming answers would occur. When typical compared with atypical post-event information was presented to a typical film item, participants reported high recollection and familiarity judgments. In contrast, atypical compared with typical post-event information to an atypical film item resulted in borderline higher recollection and no difference in familiarity. Typical items appear to be retrieved from the memory with stronger episodic and semantic traces than atypical items, when the film item and post-event information are matched. This would then lead to more conforming answers, because the participant is experiencing the retrieval more like an accurate than inaccurate answer; as implied by the findings using the recollection and familiarity scales.

In Study 2 we also examined the level of expectancy of schematic post-event information items. We found no difference between highly and moderately expectant items, and no interaction with the post-event information schema. This contrasts with the results of Roediger et al. (2001) who found that highly expectant items result in more conforming answers than less expectant items, but is consistent with Huff et al. (2013) who showed no effect of expectancy.

The level of expectancy is a problematic measure, as slight variations of expectancy may be more heavily influenced by the individual's own schema for the event. Each participant would have their own expectations of what should occur during an event, and it is not unreasonable to suggest that most items would be either typical or atypical. Within these categories, however, participants may vary on how expected or unexpected they believe the item may be. This variation in participants expectations would then affect results.

To clearly determine the effect of schemas within the misinformation paradigm,

further research needs to be conducted. Here we have presented evidence that suggests that the initial memory is one of the driving forces behind the effect of the film schema on conforming answers. The post-event information schema works independently of the initial memory, as expected for a manipulation presented once the initial memory has been formed and tested. Discrepancy detection appears to provide an explanation for the effect of schemas, however there was no effect of schemas on conforming answers in that particular study (Study 4).

Extending discrepancy detection to schematic misinformation studies using novel stimuli would provide additional evidence that this is a driving factor in schematic misinformation effects. Tousignant, Hall, and Loftus (1986) demonstrated that differences in attention measured by reading speed affect discrepancy detection, which was supported for schematic items in Study 4. Using an attention measure, such as eye-tracking software, would provide further evidence that differences in attention result in differences in both discrepancy detection and schematic memory.

Post-Event Information Type And Initial Accuracy On Conforming Answers

The initial memory was shown to affect conforming answers in all four studies presented in this thesis. Accurate and high confidence items were most resilient to the post-event information, and inaccurate and weak memories most likely to lead to conforming answers. When the participant has an accurate memory for the item, it is also likely to be retrieved from the memory strongly and easily and they will also more easily retrieve this item during the final questionnaire. When reading the post-event narrative misinformation contrasts highly to their memory for the item, discrepancies can be detected and rejected. These initially accurate items would therefore be maintained throughout the memory tests. Similarly, highly confident memories would contrast with the post-event information and would be easily retrieved from the memory during the

final memory test. This pattern of results replicates that shown by Wright and Villalba (2012), whilst extending this to schematic post-event information.

When participants were able to retrieve an accurate initial item, they were also more likely to detect a discrepancy and were therefore able to reject this as inaccurate. Despite the fewer conforming answers and higher discrepancy detection for accurate initial items, detected discrepancies resulted in more conforming answers than when a discrepancy was not detected. Therefore, when participants were accurate and detected a discrepancy they were more likely to give a conforming answer than when they did not detect a discrepancy, however this was lower overall than when the participant reported an inaccurate initial answer.

When the participant had accurate initial memory and detected a discrepancy, they were more likely to be able to report the accurate answers in addition to the misinformation, if asked. That is, if participants were asked for items from both sources they would be able to report this, and if specifically warned against reporting a discrepancy this would likely affect their answer. When warnings are used successfully in a misinformation study it is likely due to detected discrepancies coupled with increased monitoring of the item source. In Study 4 we showed that participants reported the item from the incorrect source (i.e. a conforming answer or an incorrect narrative answer) when they reported using the wrong source to answer the final questionnaire. This however did not take into account the participants who were initially inaccurate, who even when detecting a discrepancy cannot report the accurate answer. For initially inaccurate items to which they detect a discrepancy, the only way for a participant to report a correct answer was to report the post-event information in the hope that it was accurate (which in these studies it often was).

The post-event information type and initial accuracy were combined to create a

new variable with three levels, that represented the three occasions when participants could report a conforming answer. When misinformation was presented a conforming answer could occur when the initial memory was accurate or inaccurate, however for correct post-event information a conforming answer could only occur when the initial memory was inaccurate. This was due to the scoring of conforming answers, with a *change* between the initial and final memory test required. If the participant reported an accurate initial answer and this same item was presented as post-event information, this information could not cause a change in the memory report.

The post-event information type and initial accuracy variable affected conforming answers in Studies 2, 3, and 4, but with different patterns of results in each study. In all studies misinformation to an accurate initial answer resulted in the fewest conforming answers. However, in Study 4, this was not significantly different to misinformation to an accurate answer. In Study 3, correct post-event information to an inaccurate initial answer resulted in more conforming answers than misinformation to an inaccurate initial answer, however this was a non-significant trend in Study 2, and not significant in Study 4. It seems, therefore, that correct post-event information may affect conforming answers differently to misinformation, however this only occurred when both cued-recall and recognition tests were used initially. The difference between these post-event information types was shown by Rush and Clark (2014), however they were not able to fully control for initial accuracy due to the use of an initial free-recall test, and primarily added items (both correct and incorrect) were used, in contrast to our contradictory items.

Study 3 directly tested whether an initial recognition test would allow participants to recognize the accurate answer during the initial questionnaire, therefore increasing initial accuracy. Additionally, if participants were able to recognize the correct post-event information as accurate despite being unable to recall this, resulting in conforming

answers, the conforming answers would decrease due the increase in accuracy. Participants were no more accurate when completing the initial recognition compared with cued-recall questionnaire, although accuracy for typical items did increase. There was also no effect of the initial questionnaire type on conforming answers, and this did not interact with the post-event information type and initial accuracy variable. Furthermore, this was the only study where the comparison between correct post-event information and misinformation to an inaccurate initial memory was significant. When the accuracy of the post-event information affects conforming answers, this is therefore not due to the participant recognizing the item.

The post-event information type by initial accuracy variable also affected detected discrepancies, but did not interact with discrepancy detection on conforming answers. Misinformation to an accurate initial item was detected more frequently than either type of post-event information to an inaccurate initial item. There was also no difference between the post-event information types for inaccurate initial answers on detected discrepancies, therefore we can conclude that participants did not detect misinformation as discrepant more often than correct information.

When the item was initially inaccurate, the discrepancy is between the inaccurate item and the post-event information, which is a different type of discrepancy than between an accurate item and misinformation. Individuals are able to tell that there is a difference between the items. However when they are initially inaccurate, the discrepancy is with an item other than the occurrence. People may therefore believe that the post-event information was different to their initial answer and that their initial answer was accurate, or that the post-event information is different because it is correct and their memory isn't. Discrepancy detection shows that correct post-event information and misinformation work in the same way when the initial memory is inaccurate, with both types of post-

event information being new to the participant.

The final recollection and familiarity judgments used in Study 2 showed that correct post-event information was more familiar but was not better recollected than misinformation. The correct information was presented to participants twice, once during the film and once during the narrative. The misinformation in contrast was only presented during the narrative. This may have caused the correct item to become more familiar than the misinformation. When participants were initially inaccurate, however, the correct post-event information was essentially new during the narrative. This indicates that there may be memory differences due to the accuracy of the post-event information, however why this would occur is still unclear.

In Study 1, we used added misinformation in addition to the contradictory and correct post-event information, however there was no difference between the misinformation types on overall conforming answers. Added misinformation appears to act differently to contradictory and correct post-event information, probably because no item is present during the event. Therefore the item and schema can only exist in the misinformation. Despite this difference, Rush and Clark (2014) were able to present added correct post-event information to participants, so the current method could be extended to these items. The problem lays in the method of gaining the initial memory report. As previously mentioned, using an initial free-recall test (Rush & Clark, 2014) means that the participant may have simply withheld their answer even if it was accurate, therefore we cannot conclude that all of the added correct items presented to participants were to a similar memory. Only if the participant reported the item incorrectly (instead of withholding this) can we be sure of the initial accuracy, however this then becomes contradictory misinformation. This difficulty will have to be overcome before research is able to be conducted on these items.

Further research needs to be conducted to explore when an effect of post-event information type emerges and when it does not. This thesis has extended the findings of Rush and Clark (2014) by showing that there is an advantage of correct post-event information on conforming answers when using schematic items, but that this only occurs when initial recognition tests are used. Furthermore, participants did not indicate on their discrepancy detection questionnaire that they recognized the item as accurate whilst reading the narrative. This was not directly asked, however, and may prove a fruitful avenue for future research. Using an interview technique, where the researcher is able to ask participants in detail for their memory characteristics and beliefs about the item they have retrieved, may show differences in the way they deal with correct post-event information to misinformation. Specifically, participants may be able to indicate when the correct item is more familiar to them without being able to retrieve it, or if they have a sudden recognition of the accurate item.

Centrality On Initial Accuracy And Conforming Answers

As discussed previously, the effect of centrality on initial accuracy was qualified by the interaction with the film schema in Study 2, but in Studies 3 and 4 where the interaction was non-significant the effect of centrality was. The higher accuracy for central to peripheral items is unsurprising as these were classified from a combination of their accuracy in the pilot tests and the definition given by Loftus (1979). The centrality of the item did not affect conforming answers even before controlling initial accuracy. Luna and Migueles (2009) among others showed that peripheral misinformation resulted in a greater misinformation effect, however the current thesis has used schema-relevant items in contrast to the irrelevant items used in previous centrality misinformation research. The variations in attention due to the relevance of the schematic item may have contributed to the difference in findings.

Despite the consistent lack of effect of centrality on conforming answers, there was an effect on correct narrative answers. Participants reported more correct narrative answers for peripheral than central items. This demonstrates that participants must attend to the peripheral items during the narrative, in order to report these in the final narrative questionnaire. The lack of effect on conforming answers may therefore occur as participants are rejecting the peripheral post-event information. Additionally, the fewer correct narrative answers to central items may have occurred as participants maintain these items throughout the study, due to stronger initial memories and the ease of retrieval of these items.

Memory Characteristics Measures

The memory characteristics measures were used in all studies in this thesis for two main purposes: to determine what types of memories were more susceptible to the effects of post-event information (i.e. became conforming answers); and to see if there were differences in the memory between different item type, especially conforming and non-conforming answers. Confidence ratings were used throughout the studies in this thesis, and showed that the confidence of an initial item affects conforming answers even when controlling for accuracy. When looking at correct narrative answers, no effect of initial accuracy was found but an effect of initial confidence was found for accuracy of narrative answers with correct narrative answers having lower initial confidence than incorrect narrative answers. Accuracy and confidence appear to be working somewhat independently from each other. This is possibly due to confidence relating to the retrieval of the item in regards to participants being more confident in their answer based on how the item was retrieved, whereas accuracy is inherent within the answer itself.

Confidence was also used as a final measure across all studies, with the conformity status of an answer significantly affecting final mean confidence for all

studies. Non-conforming answers were given with higher confidence than conforming answers, however this was qualified by a significant interaction with final accuracy for Studies 1, 2, and 3 which showed that accurate non-conforming answers were reported with higher mean final confidence than inaccurate and conforming answers. Participants are therefore able to retrieve accurate non-conforming answers from the memory with higher confidence than any other type of item. This would be due to the items being encoded strongly and retrieved easily, therefore being recalled accurately and maintained throughout the study. The strength of encoding and ease of retrieval would then be given as a high confidence rating.

In Study 1 we used remember, know, and guess judgments as a memory characteristics measures, which we replaced for Study 3 with recollection and familiarity scales. These are both used to measure episodic and semantic memory processes. Remember, know, and guess judgments were used to indicate whether any episodic detail is retrieved from the memory, with participants only reporting a know judgment if semantic but not episodic detail is retrieved. Using the separate scales we were able to determine the separate processes for each item.

When reporting an accurate non-conforming answer, it was retrieved from the memory with episodic detail, and the item was familiar. Inaccurate and conforming answers were retrieved from the memory with less episodic detail, and were less familiar. Participants were also highly confident in their accurate non-conforming answers. Remember, know, guess judgments have shown some promise within misinformation paradigms, with Paterson et al. (2011) discussing the potential use of this measure as a means to differentiate between conforming and non-conforming answers. These judgments are limited however as they cannot take both the episodic and semantic memories into account when both play a role. The separate recollection and familiarity

judgments are able to do this, however the interpretation of these results in a misinformation paradigm using both correct and incorrect post-event information is problematic as there is not a strong body of research demonstrating what these measures tell us about the memory. Once further research has been conducted on the measures themselves, it would be useful to further apply these to a misinformation paradigm with the aim of discriminating between conforming and non-conforming answers, but importantly to also gain understanding into how these items occur in the memory.

Conclusion

The current thesis has demonstrated that the participant's initial memory of an item plays an important role in whether that item becomes a conforming answer. The initial memory is influenced by the schema of the film item, however the film schema does not play an independent role on conforming answers. The effect of the post-event information schema is independent of the initial memory, however the effect on conforming answers was inconsistent throughout the four studies. The effect of post-event information type was also considered throughout the studies in this thesis, and was shown to interact with the initial accuracy of an item on conforming answers.

Two potential explanations for the effect of schemas and post-event information type on the initial memory and conforming answers were examined: the initial questionnaire type, and discrepancy detection. The cued-recall and multiple-choice recognition tests influenced the way in which the film schema affected the initial memory, but did affect conforming answers. The chance to recognize the item in the initial memory test did not affect the way in which participants reported conforming answers to correct post-event information. Discrepancy detection was affected by the film and post-event information schemas, but not the post-event information type. An examination of final narrative questionnaire indicated that participants report post-event information

differently when meant to.

Overall, this thesis demonstrated that film schemas affect the initial memory report, and the initial memory plays an important role in the misinformation effect. The post-event information interacts with the initial memory in its effect on conforming answers.

Take Home Messages

The current thesis has highlighted several avenues for future research that should be explored further. The misinformation paradigm has been used to demonstrate the vast effects of misinformation on people's memories, however it has neglected the vital importance of the individuals own memory systems in the effect. Although it is practically important to understand how misinformation affects memory, especially in applied settings, it is equally important to understand what role the individual themselves has in this equation. The lack of research on the interplay between the individuals initial memory of the event and the misinformation presented to them has created a gaping hole in understanding of misinformation memories. This thesis has started to explore the importance of the initial memory and has demonstrated that this does in fact contribute largely to any effect of misinformation. Much research needs to be done however before we can truly say that we understand the role of this initial memory.

In demonstrating the role of the initial memory in the misinformation effect we have also shown the importance of using innovative ways to implement old methods in research. The use of an initial questionnaire in these studies has allowed us to identify this hole in understanding regarding the initial memory. The method used in these studies was not startlingly new but was a necessary adaption to start exploring new areas of the misinformation effect. Further research using the methods from the current thesis, and using other new or altered methods, should be conducted in this area to explore the outer

reaches of our understanding of misinformation and memory.

The final study in the current thesis asked participants for a short recount of their experiences from the study. This has indicated that participants can be aware of misinformation but nevertheless report it, or may not be aware of it and report a conforming answer. Further work needs to be done in examining the experiences of misinformation studies, to determine why participants knowingly report misinformation and how they experience misinformation when they don't know it is incorrect. The research tried to understand this through the use of metacognitive measures, however these do not give us a clear understanding of the complex issues surrounding decision making and memory experiences. Mixed-methods experimental research would be beneficial in this area, however qualitative aspects of misinformation research is currently lacking.

One of the results that runs strongly through the current thesis is of correct post-event information on memory reports. A misinformation effect is usually considered a negative as the individuals memory is altered to be incorrect. With further research, the potentially stronger effect of correct information on memory may indicate mechanisms for the integration of information into the memory, and may help researchers understand the types of information that are likely to cause these effects. As implied in the name, the misinformation effect has focused on misinformation rather than correct information, therefore this is an area with vast room for further study.

The main take home message from the current thesis is this: Further research needs to be done in the area of misinformation. Researchers need to consider new ways to use the existing methods and create new methods for examining this issue. We need to consider the misinformation effect more holistically, considering correct information as well as misinformation, the initial as well as final memories of the participant, and the

full participant experience of misinformation.

References

Baayen, R. H., Davidson, D. J., & Bates, D. M. (2008). Mixed-effects modeling with crossed random effects for subjects and items. *Journal of Memory and Language, 59*, 390-412. doi: 10.1016/j.jml.2007.12.005

Bates, D. M., Maechler, M., & Bolker, B. (2011). lme4: Linear mixed-effects models using S4 classes. from http://CRAN.R-project.org/package=lme4

Bickle, R. (2007). *Multilevel analysis for applied research: It's just regression!* New York: Guildford Press.

Blank, H. (1998). Memory states and memory tasks: an integrative framework for eyewitness memory and suggestibility. *Memory, 6*, 481-529. doi: 10.1080/741943086

Blank, H., & Launey, C. (2014). How to protect eyewitness memory against the misinformation effect: A meta-analysis of post-warning studies. *Journal of Applied Research in Memory and Cognition*. doi: 10.1016/j.jarmac.2014.03.005.

Chan, J., C.K, Wilford, M. W., & Hughes, K. L. (2012). Retrieval can increase or decrease suggestibility depending on how memory is tested: The importance of source complexity. *Journal of Memory and Language, 67,* 78-85. doi: 10.1016//j.jml.2012.02.006

Dalton, A. L., & Daneman, M. (2006). Social suggestibility to central and peripheral misinformation. *Memory, 14*, 486-501. doi: 10.1080/09658210500495073

Gabbert, F., Memon, A., & Wright, D. B. (2006). Memory conformity: Disentangling the steps towards influence during a discussion. *Psychonomic Bulletin and Review, 13*, 480-485. doi: 10.3758/BF03193873

Gordon, L. T., & Thomas, A. K. (2014). Testing potentiates new learning in the misinformation paradigm. *Memory and Cognition, 42*, 186-197. doi: 0.3758/s13421-013-0361-2

Hekkanen, S. T., & McEvoy, C. (2005). Source monitoring in eyewitness memory: implicit associations, suggestions, and episodic traces. *Memory and Cognition, 33*, 759-769. doi: 10.3758/BF03193072

Higham, P. A., & Vokey, J. R. (2004). Illusory recollection and dual-process models of recognition memory. *The Quarterly Journal of Experimental Psychology, 57A*, 714-744. doi: 10.3758/BF03193401

Huff, M. J., Davis, S. D., & Meade, M. L. (2013). The effects of initial testing on false recall and false recognition in the social contagion of memory paradigm. *Memory and Cognition, 6*, 820-831. doi: 10.3758/s13421-013-0299-4

Loftus, E. F. (1979). Reactions to blatantly contradictory information. *Memory and Cognition, 7*, 368-374. doi: 10.3758/BF03196941

Loftus, E. F., Miller, D. G., & Burns, H. J. (1978). Semantic integration of verbal information into a visual memory. *Human Learning and Behaviour, 4*, 19-31.

Luna, K., & Migueles, M. (2008). Typicality and misinformation: two sources of distortion. *Psicologica, 29*, 171-187. doi: 10.1037/a0023276

Luna, K., & Migueles, M. (2009). Acceptance and confidence of central and peripheral misinformation. *Spanish Journal of Psychology, 12*, 405-413.

Magner, E. S., Markham, R., & Barnett, C. (1996). Would reading an account of an event refresh your memory? *Journal of Applied Psychology, 81*, 769-776. doi: 10.1037/0021-9010.81.6.769

Maras, K., & Bowler, D. M. (2011). Brief report: schema consistent misinformation effects in eyewitnesses with autism spectrum disorder. *Journal of Autism and Developmental Disorders*. doi: 10.1007/s10803-010-1089-5

Nemeth, R. J., & Belli, R. F. (2006). The influence of schematic knowledge on contradictory and additive misinformation: false memory for typical and atypical

items. *Applied Cognitive Psychology, 20*, 563-573. doi: 10.1002/acp.1207

Paterson, H. M., Kemp, R. L., & Ng, J. R. (2011). Combating co-witness contamination: attempting to decrease the negative effects of discussion on eyewitness memory. *Applied Cognitive Psychology, 25*, 43-52. doi: 10.1002/acp.1640

R Development Core Team. (2011). *R: A language and environment for statistical computing*. Vienna, Austria: R Foundation for Statistical Computing.

Roediger, H. L., Meade, M. L., & Bergman, E. T. (2001). Social contagion of memory. *Psychonomic Bulletin and Review, 8*, 365-371. doi: 10.3758/BF03196174

Rojahn, K., & Pettigrew, T. F. (1992). Memory for schema-relevant information: a meta-analytic resolution. *British Journal of Social Psychology, 31*, 81-109. doi: 10.1111/j.2044-8309.1992.tb00958.x

Rush, R. A., & Clark, S. E. (2014). Social contagion of correct and incorrect information in memory. *Memory, 22*, 937-948.

Sauer, J. D., Brewer, N., & Weber, N. (2008). Multiple confidence estimates as indices of eyewitness memory. Journal of Experimental Psychology: General, 137, 528-547. doi: 10.1037/a0012712

Snijders, T.A.B. (2005). Power and Sample Size in Multilevel Linear Models. In: B.S. Everitt and D.C. Howell (eds.), Encyclopedia of Statistics in Behavioral Science, Volume 3, 1570–1573. Chicester (etc.): Wiley.

Stangor, C., & McMillan, D. (1992). Memory for expectancy-congruent and expectancy-incongruent information: A review of the social and social development literatures. *Psychological Bulletin, 111,* 42-61. doi: 10.1037/0033-2909.111.1.42

Tousignant, C., Hall, D., & Loftus, E. F. (1986). Discrepancy detection and vulnerability to misinformation. *Memory and Cognition, 14*, 329-338.

Tuckey, M. R., & Brewer, N. (2003). How schemas affect eyewitness memory over

repeated retrieval attempts. *Applied Cognitive Psychology, 17*, 785-800. doi: 10.1002/acp.906

Tulving, E. (1985). Memory and consciousness. *Canadian Psychology, 26*, 1-12. doi: 10.1037/h0080017

Wright, D. B., Self, G., & Justice, C. (2000). Memory conformity: Exploring misinformation effects when presented by another person. *British Journal of Psychology, 91*, 189-202.

Wright, D. B., & Stroud, J. N. (1998). Memory quality and misinformation for peripheral and central objects. *Legal and Criminological Psychology, 3*, 273-286.

Wright, D. B., & Villalba, D. K. (2012). Memory conformity affects inaccurate memories more than accurate memories. *Memory, 20*, 254-265. doi: 10.1080/09658211.2012.654798

Appendix 1

Table of terms and definitions used in this thesis

Overall Term	Items	Definition
Post-event information	Misinformation	Information given to the participant in the narrative that is incorrect. This can lead to a *conforming answer.*
	Correct post-event information	Information given to the participant in the narrative that is correct. This can lead to a *conforming answer.*
Misinformation	Added	Misinformation that is given when the item did not exist in the event. E.g. when the robber did not wear a jacket but it is reported he did (as misinformation).
	Contradictory	Misinformation that contradicts the item from the event. E.g. when the robber wore a yellow jacket but it is report it was black.
Schema	Typical	An item that it expected from the activated schema. E.g. a robber stealing money.
	Atypical	An item that contradicts the activated schema. E.g. a robber stealing tissues.
	Neutral	An item that is neither expected from the schema or contradicts it, but is part of the schema. E.g. the robber having blue eyes. It is expected that robbers have eyes (so would be atypical if they didn't) but eye color isn't part of the schema so this is neither expected or unexpected.
Schema 'source'	Film	The 'film schema' refers to the location of the item or event that activated the schema. Although the schema is a memory system and therefore does not exist independently of the memory, the 'film schema' throughout simply means that the item in the film was schematic and was of the schemata described.
	Post-event information	Similarly to the film schema, the 'post-event information schema' refers to the item in the post-event narrative that is schematic. When referring to the film and post-event information schema interaction we mean the

		cross between the film and post-event information schemas. E.g. the item could be typical in the film, and atypical in the post-event information (or any other combination).
Centrality	Central	Items that are central to the event taking place. E.g. the actions of the robbers in a house robbery.
	Peripheral	Items that are not central to the events taking place, e.g. the background items in a house robbery.
Conforming answers	Conforming answer	When the participant changes their memory report between the initial and final questionnaires, so that the final questionnaire includes the post-event information instead of what they reported initially. This can be either inaccurate (reporting misinformation), or accurate (reporting correct post-event information). A conforming answer to correct post-event information can only occur when the participant initially reports an incorrect answer.
	Non-conforming answer	When the participant either maintains their answer between questionnaires, or changes their answer in a way that does not reflect the post-event information. E.g. misinformation that states the robber had a black jacket, but the participant reports a green jacket.
	Correct narrative answer	In the final study, the participant can accurately change their answer to reflect the narrative if this is what they were instructed. E.g. they were initially correct that the jacket was yellow, the post-event narrative stated black, the participant was asked to report the narrative item, and they stated black.
Discrepancy		Where the film and post-event information items are different. Discrepancy detection occurs when the participant is correctly able to report this discrepancy.

Appendix 2

Remember, Know and Guess Instructions

Below each question you will be asked to give a remember, know or guess judgement. This is asking you for the way that the answer appears in your memory. For each question you can only circle one answer. The descriptions of these options are given below with some sample questions for you to complete. You will also be asked why you have chosen this answer. Instructions for this are also given on this sheet.

Remember

When you *remember* something, it means that you experience a conscious recollection of this item from the film. You may be able to visualise how this item looked in the film, or recall something that you thought or felt at the time that the item was on the screen. For example, imagine you are at a party and someone comes up and starts talking to you. The person seems familiar and you realise that this person did a group assignment with you earlier in the year. This memory would be given a *remember* judgement as you can consciously recall where you have met them before.

Know

If you *know* that something occurred during the film, it will seem familiar but you may not be sure where you saw this item previously. You may feel that the item must have been in the film or it would not seem familiar. You may recognise that this item occurred, but not be able to consciously recall what you were thinking at the time; how the item related to any others; and you would not be able to visualise it. For example, if you were at a party and someone came up and started talking to you and you were sure that you knew them, but you aren't sure where from. This memory would be given a *know* judgement as this person seems familiar but you don't know why.

Guess

A “guess” response should be given when you do not recall the item from the film and are guessing what the answer may be. You must give an answer for every question; however if you have no recollections of the item at all, your answer will be a “guess”- not “remember” or “know”.

Please explain your response

After you have circled your *remember, know* or *guess* answer, you will need to explain why you have chosen this. Please be as specific as possible. For example, please do not give a response such as “I remembered it happening”, instead give a specific response such as “I can visualise the person doing that action” or “I thought at the time that I had an (object) that is the same as that”.

Sample Questions

Please read through the questions carefully. After each question you will be asked if this is an example of *remembering, knowing,* or *guessing.* Please circle which answer you believe this to be and then give a reason why you believe this to be so. Once everyone has completed this the researcher will go over the answers. If you have any questions, please wait until this has been done. Note: these are for your own use, please do not hand these to the researcher or place your ID code on this sheet.

1. You are in a multiple choice test and don't recognise any of the answers, and you don't think that your lecturer has covered this. You pick B because you haven't used a B yet.

Please circle your memory judgement.

Remember Know Guess

Please explain this answer:_____
_____

2. Someone asks you what date an exam is on and you reply with November 5. They ask you why you think this and you reply that it is your best friend's birthday the day before and you are upset that you can't go out for it.

Please circle your memory judgement.

Remember Know Guess

Please explain this answer:_____
_____

3. Someone asks you if you have seen the movie "Finding Nemo". You say that you have because you seem to recognise the name, but don't remember anything about the movie or where and when you may have seen it.

Please circle your memory judgement.

Remember Know Guess

Please explain this answer:_____
_____

Appendix 3

Secondary analyses from Studies 1, 2, 3 and 4

Throughout studies 1, 2, 3 and 4 some additional exploratory analyses were conducted, in addition to the hypothesis testing and follow-up presented in the main body of this thesis. These exploratory analyses may be of interest to the reader, using the main variables considered within the main results sections presented earlier. Results should be considered with care due to their exploratory nature with little basis in hypothetical reasoning.

Study 1

Memory report prior to the presentation of post-event information

Film schema on confidence. The schema of the film item significantly affected the initial confidence of the item when statistically controlling for initial accuracy ($\chi^2(3) = 21.94$, $p < .001$) and when not controlling accuracy ($\chi^2(3) = 21.79$, $p < .001$). Mean confidence was higher when the participant was presented with a typical film item compared with atypical items ($b = -9.07$, $SE_b = 4.83$, $p = .03$) and irrelevant items ($b = -16.71$, $SE_b = 4.82$, $p < .001$). When atypical items were presented to the participant higher mean confidence was given compared with irrelevant items ($b = -7.89$, $SE_b = 4.81$, $p = .05$).

Nothing items resulted in lower mean confidence compared with typical items ($b = -19.60$, $SE_b = 4.41$, $p < .001$) and atypical items ($b = -11.04$, $SE_b = 4.42$, $p = .006$). There was no significant difference in mean initial confidence between nothing and irrelevant items ($b = -3.31$, $SE_b = 4.43$, $p = .23$).

An investigative analysis was conducted to test the interaction between initial accuracy and film schema on initial confidence, and was significant ($\chi^2(3) = 16.66$, $p <$

.001). Simple effects analyses were conducted by examining the effect of initial accuracy for each film item separately. Inaccurate items were reported with lower mean initial confidence compared with accurate items when the participant was presented with typical film item (b = 25.94, SE_b = 10.93, p = .01), atypical film items (b = 65.72, SE_b = 5.68, p < .001), irrelevant items (b = 37.85, SE_b = 7.04, p < .001), and nothing items (b = 21.45, SE_b = 9.85, p = .02).

Initial confidence and initial remember, know, and guess. Initial remember, know, guess judgments were significantly related with initial confidence when statistically controlling for initial accuracy ($\chi^2(2) = 412.87$, $p < .001$) and without controlling accuracy ($\chi^2(2) = 495.38$, $p < .001$). Remember judgments were given with higher mean confidence compared with know judgments (b = -35.48, SE_b = 3.19, p < .001), and guess judgments (b = -68.25, SE_b = 3.02, p < .001). Guess judgments were reported with lower mean confidence compared with know judgments (b = -32.77, SE_b = 4.05, p < .001).

Film schema on initial remember, know, and guess. The effect of the film schema on initial remember, know, and guess judgments was significant ($\chi^2(3) = 22.30$, $p < .001$). Analyses were conducted to compare the film schema on each judgment separately. Remember judgments were compared with know and guess judgments combined; know judgments to remember and guess combined; and guess judgments to remember and know combined, with all proportions shown in

Table 36. These comparisons were run due to the nature of the multilevel models used. Only binomial comparisons can be made.

Table 36

Initial Remember, Know, and Guess Judgments by Film Schema

	Initial RKG		
Film Schema	**Remember**	**Know**	**Guess**
Typical	.91	.04	.04
Atypical	.85	.06	.09
Irrelevant	.63	.17	.17
Nothing	.64	.14	.20

Remember judgments. When presented with a typical film item, there was no significant difference in the proportion of remember judgments compared with atypical items (b = -0.56, SE_b = 0.52, p = .28), but a higher proportion compared with irrelevant items (b = -1.77, SE_b = 0.47, p < .001). Atypical items resulted in a higher proportion of remember judgments compared with irrelevant items (b = -1.22, SE_b = 0.41, p = .003).

Know judgments. Typical items resulted in no significant difference in the proportion of know judgments compared with atypical items (b = 0.29, SE_b = 0.73, p = .69), but a lower proportion of know judgments compared with irrelevant items (b = 1.49, SE_b = 0.62, p = .02). A lower proportion of know judgments was given when participants were presented with atypical compared with irrelevant items (b = 2.10, SE_b = 1.07, p = .05).

Guess judgments. Typical items resulted in no significant difference in the proportion of guess judgments compared with atypical items (b = 0.98, SE_b = 0.73, p = .18), but a lower proportion of guess judgments compared with irrelevant items (b = 1.68, SE_b = 0.68, p = .01). There was no significant difference in the proportion of guess judgments when participants were presented with atypical or irrelevant items (b = 0.72, SE_b = 0.51, p = .16).

The misinformation effect

Initial remember, know, and guess. Initial remember, know, guess judgments significantly affected the proportion of conforming answers when statistically controlling for initial accuracy or not controlling accuracy. When an initial remember judgment (.03 [$.06_{adj}$]) was given there was no significant difference in the proportion of subsequent conforming answers compared with know judgments (.06 [$.11_{adj}$]). When initial guess judgments (.17 [$.24_{adj}$]) were reported the subsequent proportion of conforming answers was higher compared with remember judgments, but no significant difference in proportions compared with know judgments.

Memory report after the presentation of post-event information

Change in confidence. There was no significant effect of post-event information type on change in confidence ($\chi^2(2) = 4.30$, $p = .12$).

Conformity status. The conformity status of an answer was significantly related to the change in confidence reported for that answer ($\chi^2(1) = 23.84$, $p < .001$). Non-conforming items ($M = 2.23$, $SD = 20.96$) resulted in a smaller increase in confidence compared with conforming items ($M = 19.33$, $SD = 36.38$); $b = 17.10$, $SE_b = 4.35$, $p < .001$.

The interaction between conformity status and post-event information type on change in confidence was non-significant ($\chi^2(2) = 2.51$, $p = .28$).

Study 2

Initial Confidence

Film schema. The effect of the film schema on initial confidence was significant without controlling initial accuracy ($\chi^2(1) = 4.93$, $p = .03$. Shown in Table 37, typical film items resulted in lower mean initial confidence compared with atypical film items ($b =$

5.83, SE_b = 2.62, p = .01).). However, when controlling accuracy this was non-significant ($\chi^2(1) = 1.58$, p = .21)

The interaction between the film schema and initial accuracy was significant ($\chi^2(1) = 6.48$, p = .01). Simple effects analyses were conducted by examining the effect of the film schema on initial confidence for accurate and inaccurate items separately. As shown in Table 37, when the initial answer was accurate, typical film items resulted in lower mean initial confidence compared with atypical film items (b = 10.24, SE_b = 2.77, p < .001). When the initial answer was inaccurate, there was no significant difference in mean initial confidence between typical and atypical film items (b = -1.45, SE_b = 3.31, p = .33).

Table 37

Initial Accuracy and Film Schema on Mean [Adjusted Mean] (SD) Initial Confidence (95% CI)

	Initial Accuracy		
Film Schema	**Accurate**	**Inaccurate**	**Total**
Typical	76.27 (67.13, 85.41)	42.41 (33.02, 81.80)	57.00 [39.88_{adj}] (41.84, 72.16)
Atypical	85.22 (78.54, 91.90)	39.68 (33.62, 45.74)	62.83 [42.60_{adj}] (45.97, 79.69)
Total	81.05 (72.16, 89.94)	41.11 (31.55, 58.37)	

Centrality. There was a significant effect of centrality on initial confidence when not controlling initial accuracy ($\chi^2(1) = 4.68$, p = .03). Shown in Table 38, central items resulted in higher mean initial confidence compared with peripheral items (b = -27.41, SE_b = 12.16, p = .01). This effect, however, was non-significant when controlling accuracy ($\chi^2(1) = 1.94$, p = .16)

Table 38

Mean [Adjusted Mean] (SD) Initial Confidence by Initial Accuracy and Centrality (95% CI)

	Initial Accuracy		
Centrality	**Accurate**	**Inaccurate**	**Total**
Central	85.41 (77.09, 93.73)	54.80 (40.28, 69.32)	77.06 [48.31_{adj}] (57.78, 96.34)
Peripheral	79.98 (69.67, 90.29)	35.50 (17.75, 53.25)	49.65 [37.05_{adj}] (14.17, 85.13)
Total	81.05 (72.16, 89.94)	41.11 (31.55, 58.37)	

The interaction between centrality and initial accuracy on initial confidence was also significant ($\chi^2(1) = 4.68$, $p = .03$). Simple effects analyses were conducted by comparing central and peripheral items on initial mean confidence for accurate and inaccurate items separately. When the initial answer was accurate there was no significant difference in mean initial confidence between central and peripheral items ($b = -3.84$, $SE_b = 2.98$, $p = .10$). When the initial answers was inaccurate central items resulted in significantly higher mean initial confidence compared with peripheral items ($b = -14.63$, $SE_b = 4.29$, $p < .001$).

The misinformation effect

Film and post-event information schemas. The interaction between the film and post-event information schemas was borderline significant without controlling initial accuracy. Simple effects analyses were undertaken to compare the post-event information schema on the proportion of conforming answers for typical and atypical film items separately. For typical film items, a higher proportion of conforming answers were given following typical post-event information compared atypical post-event information. In

contrast for atypical film items there was no significant difference in the proportion of conforming answers given following either typical or atypical post-event information. When controlling accuracy the interaction was no longer borderline significant.

The interaction between the schema of the film item and the centrality of the item on conforming answers was significant. Simple effects analyses were conducted to examine the effect of the film schema on conforming answers for central and peripheral items separately. For central items, typical film items (.22 [$.36_{adj}$]) resulted in a higher proportion of conforming answers compared with atypical items (.08 [$.23_{adj}$]). For peripheral items there was no significant difference in the proportion of conforming answers between typical (.22 [$.28_{adj}$]) and atypical film items (.20 [$.24_{adj}$]). However, after controlling for initial accuracy, the interaction was no longer significant.

Schema Expectancy. Post-event information items were categorized as either highly expectant or moderately expectant, in addition to being typical or atypical. The expectancy of the post-event information schema did not significantly affect conforming answers, and the interaction with the post-event information schema was also non-significant. Highly typical items (.16 [$.21_{adj}$]) were reported with no significant difference in the proportion of conforming answers, compared with moderate typical items (.10 [$.17_{adj}$]), moderate atypical items (.20 [$.29_{adj}$]), and highly atypical items (.13 [$.20_{adj}$]).

Centrality. There was no significant relationship between centrality and conforming answers both without controlling for initial accuracy and with controlling accuracy. In contrast to our prediction there was no significant difference in the proportion of conforming answers between central items (.14 [$.31_{adj}$], 95% CI = .07, .26) and peripheral items (.21 [$.26_{adj}$], 95% CI = .13, .32).

Change In Confidence

Relationship with conforming answers. There was a significant effect of

conformity status on change in confidence ($\chi^2(1) = 53.72$, $p < .001$). As predicted, non-conforming answers resulted in a smaller increase in confidence ($M = 2.58$, $SD = 25.75$) compared with conforming answers ($M = 25.82$, $SD = 38.32$); $b = 23.25$, $SE_b = 3.18$, $p < .001$.

Relationship with post-event information type. There was a significant effect of post-event information type on change in confidence ($\chi^2(1) = 9.48$, $p = .002$). Correct post-event information ($M = 12.87$, $SD = 30.44$) resulted in a larger increase in confidence compared with contradictory misinformation ($M = 4.35$, $SD = 29.70$); $b = -8.52$, $SE_b = 2.76$, $p = .001$.

There was no significant interaction between post-event information type and conformity status on change in confidence ($\chi^2(1) = 0.01$, $p = .93$).

Initial Recollection And Familiarity

To assess the relationship between the continuous measures of initial recollection, familiarity, and confidence, the analyses were run using standard scores for all three variables. In this case, the regression coefficient is equivalent to a correlation coefficient and reflects the standardized relationship between variables. Unlike in a traditional regression analysis where the coefficient is identical irrespective of which variable is used as the predictor, the nesting (items nested within individuals) in these multi-level models produces different coefficients depending on which variable is used as a predictor. Multi-level analyses were run regressing each variable on the other two variables in singe predictor models. The results of these six analyses are shown in Table 39.

Table 39

Correlations Between Initial Recollection and Familiarity Judgments and Confidence Ratings

	Dependent variable		
	Recollection	Familiarity	Confidence
Recollection	-	.73***	.86***
Familiarity	.67***	-	.73***
Confidence	.90***	.80***	-

*** $p < .001$

From Table 39, it is evident that all variables are strongly positively correlated. Higher recollection is associated with higher familiarity. Likewise, higher confidence is associated with higher recollection and familiarity.

Initial accuracy. The relationship between initial accuracy and recollection was significant ($\chi^2(1) = 184.21$, $p < .001$), as was the relationship between accuracy and familiarity ($\chi^2(1) = 132.04$, $p < .001$). Inaccurate answers were reported with lower mean scores compared with accurate answers for both initial recollection ($b = 1.96$, $SE_b = 0.13$, $p < .001$) and familiarity ($b = 1.78$, $SE_b = 0.14$, $p < .001$) as shown in Table 40.

Table 40

Mean (SD) Initial Recollection and Familiarity Scores by Initial Accuracy, Film Schema, and Centrality

		Recollection	**Familiarity**
Initial Accuracy	**Accurate**	5.13 (1.13)	4.93 (1.32)
	Inaccurate	3.18 (1.60)	3.15 (1.67)
Film Schema	**Typical**	3.98 [3.16_{adj}] (1.80)	3.92 [3.16_{adj}] (1.79)
	Atypical	4.21 [3.20_{adj}] (1.80)	4.07 [3.15_{adj}] (1.85)
Centrality	**Central**	0.45 [3.50_{adj}] (1.44)	0.40 [3.45_{adj}] (1.56)
	Peripheral	-0.27 [3.00_{adj}] (1.84)	-0.24 [3.00_{adj}] (1.83)

Film schema. In contrast to our predictions, the effect of film schema on initial recollection was non-significant whether accuracy was not controlled for ($\chi^2(1) = 1.38$, $p = .24$) or was controlled ($\chi^2(1) = 0.18$, $p = .67$). The effect of film schema on initial familiarity was non-significant: without controlling for accuracy ($\chi^2(1) = 1.22$, $p = .27$), after controlling accuracy ($\chi^2(1) = 0.008$, $p = .93$).

Centrality. The effect of centrality on initial recollection was significant ($\chi^2(1) = 4.70$, $p = .03$). As shown in Table 40, central items resulted in higher mean initial recollection than peripheral items ($b = -1.31$, $SE_b = 0.58$, $p = .01$). However, after controlling for accuracy ($\chi^2(1) = 1.71$, $p = .19$), centrality no longer predicted differences in initial recollection. The effect of centrality on initial familiarity was also significant without controlling accuracy ($\chi^2(1) = 6.19$, $p = .01$) but non-significant once accuracy was controlled for ($\chi^2(1) = 2.56$, $p = .11$). Prior to controlling for accuracy, central items resulted in higher mean familiarity compared with peripheral items ($b = -1.17$, $SE_b = 0.43$, $p = .003$).

Post-event information schema. There was no significant effect of the post-event information schema on either final recollection ($\chi^2(1) = 0.99$, $p = .32$) or final familiarity ($\chi^2(1) = 0.14$, $p = .71$). The interaction with the film schema however was significant for both final recollection ($\chi^2(1) = 5.65$, $p = .02$) and familiarity ($\chi^2(1) = 8.12$, $p = .004$). Simple effects analyses were conducted by examining the effect of the post-event information schema on both final recollection and familiarity for typical and atypical film items separately. Shown in Table 41, for typical film items, typical post-event information resulted in higher mean scores than atypical post-event information for both final recollection ($b = -0.32$, $SE_b = 0.21$, $p = .06$) and final familiarity ($b = -0.56$, $SE_b = 0.20$, $p = .004$). For atypical film items, typical post-event information resulted in borderline significantly lower final recollection scores that atypical post-event information ($b = 0.31$,

SE_b = 0.21, p = .07). There was no significant difference between typical and atypical post-event information presented to an atypical film item on final familiarity (b = 0.17, SE_b = 0.18, p = .17).

Film Schema. The effect of the film schema on final recollection was significant ($\chi^2(1) = 5.53$, p = .02), but was non-significant for final familiarity ($\chi^2(1) = 2.52$, p = .11). Shown in Table 41, typical film items were reported with lower mean final recollection than atypical film items (b = 0.31, SE_b = 0.13, p = .01), but there was no significant difference between typical and atypical items on mean final familiarity (b = 0.19, SE_b = 0.12, p = .06).

Table 41

Mean (SD) Final Recollection and Familiarity by the Film and Post-Event Information Schemas

		Post-Event Information Schema		
	Film Schema	**Typical**	**Atypical**	**Total**
Recollection	**Typical**	4.35 (1.71)	4.04 (1.81)	4.24 (1.76)
	Atypical	4.32 (1.79)	4.67 (1.76)	4.55 (1.77)
	Total	4.33 (1.74)	4.47 (1.80)	
Familiarity	**Typical**	4.43 (1.61)	3.91 (1.84)	4.26 (1.72)
	Atypical	4.31 (1.67)	4.52 (1.72)	4.45 (1.70)
	Total	4.38 (1.63)	4.33 (1.79)	

Post-event information type. The type of post-event information presented to participants did not significantly affect final recollection ($\chi^2(1) = 1.19$, p = .28). There was no significant difference between correct post-event information (M = 4.50, SD = 1.77) and misinformation on final recollection judgments (M = 4.35, SD = 1.77); b = -0.16, SE_b = 0.14, p = .14.

The effect of the post-event information type on final familiarity was significant ($\chi^2(1) = 4.78$, $p = .03$). Correct post-event information resulted in higher mean final familiarity responses ($M = 4.54$, $SD = 1.67$) compared with misinformation ($M = 4.26$, $SD = 1.73$); $b = -0.28$, $SE_b = 0.13$, $p = .01$.

The interactions between the post-event information type and conformity status were non-significant for both final recollection ($\chi^2(1) = 0.02$, $p = .90$) and final familiarity ($\chi^2(1) = 0.11$, $p = .74$).

Study 3

Initial memory report

Centrality on initial accuracy. The effect of centrality on initial accuracy was significant ($\chi^2(1) = 4.19$, $p = .04$). As expected, a greater proportion of accurate answers were reported by participants for central (.88, *95% CI* = .71, .96) compared with peripheral items (.53, *95% CI* = .20, .84); $b = -1.87$, $SE_b = 0.77$, $p = .02$.

The interaction between the centrality and schema of the film item on initial accuracy was non-significant ($\chi^2(1) = 0.27$, $p = .61$). The three-way interaction between the centrality and film schema of the item and the initial questionnaire type on initial accuracy was non-significant ($\chi^2(2) = 2.80$, $p = .25$).

Initial questionnaire type on initial confidence. The initial questionnaire type significantly affected initial confidence when initial accuracy was not controlled ($\chi^2(2) = 7.92$, $p = .02$). The cued-recall questionnaire resulted in lower mean confidence ($M = 64.51$ [$M_{adj} = 43.19$], $SD = 35.88$), compared with the recognition including misinformation questionnaire ($M = 71.55$ [$M_{adj} = 45.19$], $SD = 34.92$); $b = 7.04$, $SE_b = 3.79$, $p = .03$, and the recognition test without misinformation questionnaire ($M = 75.44$ [$M_{adj} = 48.45$], $SD = 30.88$); $b = 10.92$, $SE_b = 3.90$, $p = .003$. There was no significant difference between the recognition tests including and without misinformation ($b = 3.89$,

SE_b = 3.86, p = .16). However, after accuracy was controlled for, the effect of initial questionnaire type was not significant ($\chi^2(2) = 2.41$, $p = .30$)

Film schema on initial confidence. There was a significant effect of the film schema on initial confidence ($\chi^2(1) = 24.91$, $p < .001$) when controlling for initial accuracy, and without controlling accuracy, shown in Table 29. Typical items resulted in lower mean confidence compared with atypical items (b = 9.65, SE_b = 2.65, $p < .001$), as predicted.

The interaction between initial accuracy and film schema on mean initial confidence was significant ($\chi^2(1) = 18.32$, $p < .001$). Simple effects analyses were conducted by comparing typical to atypical film items on mean initial confidence for accurate and inaccurate initial items separately. For initially accurate items, typical film items resulted in lower mean initial confidence compared with atypical items (b = 17.94, SE_b = 2.27, $p < .001$). For inaccurate initial items there was no significant difference in mean confidence between typical and atypical items (b = -3.40, SE_b = 5.06, p = .25).

Table 42

Initial Confidence by Questionnaire Type, Film Schema, and Centrality With and Without Initial Accuracy Controlled in the Model

	Without Accuracy	**Including Accuracy**
Initial Questionnaire Type	$\chi^2(2) = 7.92$, $p = .02$	$\chi^2(2) = 2.41$, $p = .30$
Film Schema	$\chi^2(1) = 13.05$, $p < .001$	$\chi^2(1) = 24.91$, $p < .001$
Centrality	$\chi^2(1) = 4.03$, $p = .04$	$\chi^2(1) = 3.79$, $p = .05$

Centrality on initial confidence. The effect of centrality on initial confidence was significant when controlling initial accuracy ($\chi^2(1) = 3.79$, p = .05), and without controlling accuracy. Central items were reported with higher mean initial confidence (M = 83.11 [M_{adj} = 52.51], SD = 27.29) compared with peripheral items (M = 57.87 [M_{adj} =

38.15], *SD* = 35.92); b = -25.33, SE_b = 12.22, p = .02.

There was no significant interaction between the centrality and schema of the film item on initial confidence without controlling initial accuracy ($\chi^2(1) = 1.01$, $p = .31$) or controlling for accuracy ($\chi^2(1) = 0.42$, $p = .52$).

Appendix 4

Expectations Questionnaire

Robbery Items

The following statements relate to things that may occur during a house burglary. For each statement there are several possible items. Please rate how expected or unexpected the items are on the scale provided.

1. There is a getaway driver waiting for the robbers. He is wearing:

	Very Expected		**Neither Expected or Unexpected**		**Very Unexpected**
A black hooded jacket	1	2	3	4	5
A bright yellow hooded jacket	1	2	3	4	5
A suit jacket	1	2	3	4	5
No jacket	1	2	3	4	5
A plain blue t-shirt	1	2	3	4	5
A plain orange t-shirt	1	2	3	4	5
A t-shirt with a large pattern on the front	1	2	3	4	5
A white business shirt	1	2	3	4	5
A checked flannelette shirt	1	2	3	4	5

2. Two robbers try to force a door lock open. They find some tools in a box and use:

	Very Expected		**Neither Expected or Unexpected**		**Very Unexpected**
A screwdriver	1	2	3	4	5
A jemmy bar/crowbar	1	2	3	4	5
A paint scraper/chisel	1	2	3	4	5
A tape measure	1	2	3	4	5
A wrench	1	2	3	4	5
A garden trowel	1	2	3	4	5
A shovel	1	2	3	4	5
A paintbrush	1	2	3	4	5
They don't use a tool, they force it with their hands	1	2	3	4	5

3. On the kitchen counter there is a bowl with assorted items in it. From the bowl the robber takes:

	Very Expected		**Neither Expected or Unexpected**		**Very Unexpected**
Nothing, he looks but doesn't take anything	1	2	3	4	5
A box of Panadol	1	2	3	4	5
An iPod	1	2	3	4	5
A lighter	1	2	3	4	5
A mobile phone	1	2	3	4	5
Some nail polish remover	1	2	3	4	5
A watch	1	2	3	4	5
An apple	1	2	3	4	5
A $10 note	1	2	3	4	5

4. The getaway driver calls the robbers to tell them someone is watching. The robber replies:

	Very Expected		**Neither Expected or Unexpected**		**Very Unexpected**
"Don't worry, who cares"	1	2	3	4	5
"Come on, let's go!!"	1	2	3	4	5
"Yep, got it"	1	2	3	4	5
"Tell them to mind their own business"	1	2	3	4	5
"Stupid neighbours"	1	2	3	4	5
"It's a nice day"	1	2	3	4	5
He doesn't reply	1	2	3	4	5

5. As the robbers walk around the house they are discussing:

	Very Expected		**Neither Expected or Unexpected**		**Very Unexpected**
The easiest way to get in	1	2	3	4	5
What they want to steal	1	2	3	4	5
How much money they might get	1	2	3	4	5
The latest AFL game	1	2	3	4	5
What to buy for a girlfriends birthday	1	2	3	4	5
Their favourite TV shows	1	2	3	4	5
A friends new haircut	1	2	3	4	5
Nothing, they don't talk	1	2	3	4	5

6. The robber goes through the dressing table. He takes:

	Very Expected		**Neither Expected or Unexpected**		**Very Unexpected**
A jewellery box	1	2	3	4	5
A box of tissues	1	2	3	4	5
Some make-up	1	2	3	4	5
A hair comb	1	2	3	4	5
A handheld mirror					
A box of prescription medication	1	2	3	4	5
A gold clock	1	2	3	4	5
A religious picture	1	2	3	4	5
Nothing	1	2	3	4	5

7. The robbers both go into the study area. There are several piles of things on the table and on the bookshelf. One robber starts putting things in his bag as the other:

	Very Expected		**Neither Expected or Unexpected**		**Very Unexpected**
Goes through the items and puts them back neatly	1	2	3	4	5
Scatters things around but doesn't take anything	1	2	3	4	5
Moves things from the table to the bookshelf	1	2	3	4	5
Lays the photos facedown	1	2	3	4	5
Opens the cupboards and draws and leaves them open	1	2	3	4	5

Tries to open the window from the inside	1	2	3	4	5
Nothing	1	2	3	4	5

House items

The house that is burgled belongs to an elderly lady, who lives by herself. The following statements refer to items that may be in her house. For each statement there are several possible items. Please rate how expected or unexpected the items are on the scale provided.

8. There is a coffee table in the lounge. On the table there is lace mat, and on the mat is sitting:

	Very Expected		**Neither Expected or Unexpected**		**Very Unexpected**
A pot plant	1	2	3	4	5
A vase of flowers	1	2	3	4	5
A blender	1	2	3	4	5
A teapot	1	2	3	4	5
A bright bird figurine	1	2	3	4	5
Some "Dolly" and "Cleo" magazines	1	2	3	4	5
Some "Better Home's and Garden's" magazines	1	2	3	4	5
A baking dish	1	2	3	4	5
A bottle of wine	1	2	3	4	5
A garden gnome	1	2	3	4	5
Nothing	1	2	3	4	5
A tennis racket	1	2	3	4	5
A soft toy	1	2	3	4	5
A soccer ball	1	2	3	4	5

9. There is a clothes line outside the house. One the clothesline there is hanging:

	Very Expected		**Neither Expected or Unexpected**		**Very Unexpected**
A pair of red skinny jeans	1	2	3	4	5
A mini-skirt	1	2	3	4	5
A bright coloured jumper	1	2	3	4	5
A black jumper	1	2	3	4	5
A long skirt	1	2	3	4	5
Towels	1	2	3	4	5
Board-shorts	1	2	3	4	5
Frilly tops	1	2	3	4	5
Nothing	1	2	3	4	5

10, In the spare bedroom there is a chair sitting in the corner. On the chair there is:

	Very Expected		**Neither Expected or Unexpected**		**Very Unexpected**
A teddy	1	2	3	4	5
A hat	1	2	3	4	5
A box of chocolates	1	2	3	4	5
A large book	1	2	3	4	5
Some folded towels	1	2	3	4	5
A pair of flippers	1	2	3	4	5
Some DVD's	1	2	3	4	5
Nothing	1	2	3	4	5

11. Next to the basin in the bathroom there is:

	Very Expected		**Neither Expected or Unexpected**		**Very Unexpected**
A soap dispenser	1	2	3	4	5
Some face cream	1	2	3	4	5
A tub of "wet-ones"	1	2	3	4	5
A pen holder	1	2	3	4	5
A jar of coffee	1	2	3	4	5
A photo in a frame	1	2	3	4	5
A water bottle	1	2	3	4	5
Nothing	1	2	3	4	5

12. Propped up by the inside of the front door there is:

	Very Expected		**Neither Expected or Unexpected**		**Very Unexpected**
A bright coloured umbrella	1	2	3	4	5
A walking stick	1	2	3	4	5
A cricket bat	1	2	3	4	5
A piece of plumbing tube	1	2	3	4	5
A broom	1	2	3	4	5
Nothing	1	2	3	4	5

13. The robber pulls out a draw in the bedroom and tips it out. In the draw there is:

	Very Expected		**Neither Expected or Unexpected**		**Very Unexpected**
Socks	1	2	3	4	5
Tennis balls	1	2	3	4	5
Stockings	1	2	3	4	5
Photographs	1	2	3	4	5
Nothing	1	2	3	4	5
Jewellery	1	2	3	4	5
Chocolate bars	1	2	3	4	5

14. Next to the letter box in the front yard there is:

	Very Expected		**Neither Expected or Unexpected**		**Very Unexpected**
A garden gnome	1	2	3	4	5
A pot plant	1	2	3	4	5
A spade	1	2	3	4	5
A soccer ball	1	2	3	4	5
A delivery box	1	2	3	4	5
A bottle of wine	1	2	3	4	5
An outdoor chair	1	2	3	4	5
Nothing	1	2	3	4	5

Appendix 5

Expectancy means and standard deviations for selected items from Pilot Test 1 and for accurate items only in Pilot Test 2

			Pilot Test #1		Pilot Test #2		
Question	**Item**	**Schema**	**M**	**SD**	**Mean**	**SD**	**Schema Expectancy**
Item Sitting Next to the Letterbox on the Front Lawn	Pot Plant	Irrelevant	2.00	0.91	2.00	-[9]	NA[10]
	Bottle of Wine[11]	Irrelevant	4.44	1.10	5.60	0.55	NA
	Nothing	Irrelevant	2.94	1.21	4.00	-	NA
	Delivery Box	Irrelevant	3.06	1.11	4.00	0.00	NA
Color of the Getaway Driver's Jacket	Brown	Typical	NA	NA	2.50	2.12	High
	Black	Typical	1.50	1.04	3.43	1.72	Moderate
	Red	Atypical	NA	NA	4.63	1.69	Moderate
	Yellow	Atypical	4.11	1.23	5.71	1.70	High
	No Jacket		2.78	0.73	4.00	1.41	NA
Item Hanging on the Clothesline Near the Door where the Robber's Break In	Towels	Typical	1.50	0.71	3.00	1.41	High
	Long Skirt	Typical	1.94	0.80	3.67	0.58	Moderate
	Red Jeans	Atypical	4.67	0.69	5.17	1.17	Moderate
	Mini Skirt	Atypical	4.83	0.51	-[12]	-	High
	Jumper	Neutral	2.61	0.92	4.83	0.98	NA
	Nothing		3.11	1.28	4.00	0	NA
Tool Used to Force Door	Screwdriver	Typical	1.72	0.90	3.00	2.07	High
	Crowbar	Typical	1.39	0.61	3.29	2.14	Moderate
	Tape Measure	Atypical	4.72	0.67	5.88	1.14	Moderate
	Paint Brush	Atypical	4.94	0.24	6.88	0.35	High
	Paint Scraper	Neutral	3.06	1.09	5.50	1.41	NA
	Nothing		2.78	1.22	-	-	NA

[9] These are items that only one accurate answer was given, therefore no standard deviation occurs
[10] Irrelevant, neutral, and nothing items do not have a schema expectancy
[11] A bottle of wine was used in two scenes in the film, however this item was not used in the studies. Many incidental items were shown in multiple scenes, as would naturally occur in a house setting. It is not considered that this affected the films in any way.
[12] These are items that no accurate answers were given, therefore no mean or standard deviation occurs

Question	Item	Schema Consistency	Pilot Test #1		Pilot Test #2		Schema Expectancy
			M	SD	Mean	SD	
Tip Out of Drawer	Socks	Typical	1.72	0.90	4.75	2.44	High
	Stockings	Typical	1.83	0.92	4.88	1.46	Moderate
	Tennis Balls	Atypical	4.67	0.69	5.67	1.67	Moderate
	Chocolate Bars	Atypical	3.94	1.31	6.38	0.92	High
	Photos	Neutral	2.78	1.11	4.43	1.72	NA
	Nothing		4.28	0.96	5.60	1.52	NA
Steal From Dressing Table	Jewelry Box	Typical	1.11	0.32	2.33	0.58	High
	Gold Clock	Typical	1.39	0.78	4.50	3.54	Moderate
	Religious Picture	Atypical	4.67	0.69	5.33	1.53	Moderate
	Box of Tissues	Atypical	4.78	0.73	7.00	0.00	High
	Medication	Neutral	2.83	1.47	6.00	-	NA
	Nothing		4.00	1.09	4.00	-	NA
Lace Mat on Coffee Table	Pot Plant	Typical	2.22	1.26	3.00	-	High
	Vase of Flowers	Typical	1.72	0.90	3.67	0.58	Moderate
	Garden Gnome	Atypical	4.39	1.09	5.00	-	Moderate
	Blender	Atypical	4.50	1.04	7.00	0.00	High
	Wine Bottle	Neutral	3.11	1.18	5.17	1.33	NA
	Nothing		3.50	1.20	-	-	NA
Basin	Face Cream	Typical	1.83	0.92	2.00	-	High
	Soap	Typical	1.56	0.98	4.50	0.71	Moderate
	Pen Holder	Atypical	4.56	0.71	6.00	-	Moderate
	Jar of Coffee	Atypical	4.83	0.38	6.50	0.71	High
	Wet Wipes	Neutral	2.39	0.98	7.00	-	NA
	Nothing		3.56	0.92	4.00	-	NA

			Pilot Test #1		Pilot Test #2		
Question	**Item**	**Schema Consistency**	**M**	**SD**	**Mean**	**SD**	**Schema Expectancy**
Bowl on Kitchen Bench	iPod	Typical	1.28	0.96	2.57	2.15	High
	Watch	Typical	1.22	0.55	4.13	1.64	Moderate
	Apple	Atypical	4.17	1.10	5.29	1.11	Moderate
	Nail Polish Remover	Atypical	4.56	0.86	6.80	0.45	High
	Lighter	Neutral	3.00	1.33	6.00	1.10	NA
	Nothing		3.39	1.42	4.50	1.29	NA
Chair in Corner	Teddy	Irrelevant	2.11	0.68	4.20	1.64	NA
	DVDs	Irrelevant	3.39	0.78	-	-	NA
	Flippers	Irrelevant	4.50	0.92	-	-	NA
	Nothing	Irrelevant	3.06	0.94	4.00	0.00	NA
Robber's Reply	Come On	Typical	1.67	1.03	2.80	0.84	High
	Yep	Typical	2.22	.094	3.00	0.82	Moderate
	Nice Day	Atypical	4.44	1.20	5.83	1.33	Moderate
	Don't Worry	Atypical	3.83	1.04	5.86	1.22	High
	Tell Them	Neutral	3.56	1.338	4.75	1.75	NA
	Nothing		3.39	0.98	-	-	NA
Propped in Corner	Umbrella	Typical	1.89	0.83	2.33	0.58	High
	Walking Stick	Typical	1.56	0.62	2.33	1.16	Moderate
	PVC Pipe	Atypical	4.67	0.84	-	-	Moderate
	Cricket Bat	Atypical	4.11	1.13	6.00	-	High
	Broom	Neutral	3.06	1.06	-	-	NA
	Nothing		3.22	1.00	-	-	NA

Appendix 6

Narrative

ID Code: _____

House Break-In Narrative

Please read the following narrative carefully. After each paragraph you will find questions about the information in that paragraph, and about your opinion of the person who wrote the paragraph. The paragraphs have been written by different people, so please judge each paragraph individually. Please answer these questions as you go, and do not go back and change any. If you have any questions please ask the researcher. Once you have completed the reading and questions, please hand back to the researcher who will give you the next section of the study.

Three men drive up to a suburban house in a faded blue station wagon. The men all get out and start looking around and move to the front of the car. They are talking to each other about what they are going to do. The getaway driver says "let's make sure that no one is around". One robber replies "yeah, we better" and the other asks the driver to call him if anyone is around. The driver of the car is wearing a black *(red, yellow, grey, brown, or no jacket, just shirt[13])* hooded jacket with the hood up. You can't see what he has on under it. All three are wearing jeans. The taller of the other men is wearing a black hooded jacket with "Tool" written on the front, and the shorter is wearing a grey hooded jacket.

How confident do you think the person that wrote this was in his or her own memory? (Circle)

Very Confident	Fairly Confident	Neither Confident or Unconfident	Fairly Unconfident	Very Unconfident

Do you think there was more or less information in this paragraph then you were asked for in the questionnaire (circle)?

Much More	A little more	About the same	A little less	Much less

[13] The items in brackets and italics, and the item immediately before these, are the post-event information. Participants were only presented with one item in the narrative. They are all given here for clarity. Additionally, only one paragraph, with questions, was given per page.

The driver leans on the front of the car while the other two men walk up to the front door of the house. The house faces the street with no fence at the front. The front garden is mainly lawn with some small trees and a few bushes. There is also a letterbox, and next to the letterbox is a delivery parcel *(pot plant, bottle of wine, nothing)*. Once the men have rung the doorbell and tried the door handle, they look around and move to the side of the house.

How confident do you think the person that wrote this was in his or her own memory? (Circle)

Very Confident	Fairly Confident	Neither Confident or Unconfident	Fairly Unconfident	Very Unconfident

Do you think there was more or less information in this paragraph then you were asked for in the questionnaire (circle)?

Much More	A little more	About the same	A little less	Much less

The two men walk down a path at the side of the house trying the windows to see if they open. One of the men asks the other who lives in the house, to which the other man tells him it belongs to an elderly woman. They move to the back of the house, still trying the windows. They then walk down the other side of the house, where they find a side door next to the clothesline. On the clothesline is hanging a pair of red jeans *(a mini-skirt, long skirt, jumper, towels, or nothing)*. There is a mop propped up in the corner.

How confident do you think the person that wrote this was in his or her own memory? (Circle)

Very Confident	Fairly Confident	Neither Confident or Unconfident	Fairly Unconfident	Very Unconfident

Do you think there was more or less information in this paragraph then you were asked for in the questionnaire (circle)?

Much More	A little more	About the same	A little less	Much less

The two men get to a side door without finding anything open. The taller robber says to the shorter robber “let’s see if we can get this door open”. One of the men mentions a toolbox they had seen earlier. They walk back around the house and find the toolbox sitting on a table. They open this and take a tray out and put it on the table. They take something from the tray to use to force the door open, but you can’t see what it was they took. They then go back to the side door and use a screwdriver *(crowbar, paintbrush, paint scrapper, tape measure, or their own hands)* to break the door open. They then walk into the house via the laundry and split up to look around.

How confident do you think the person that wrote this was in his or her own memory? (Circle)

Very Confident	Fairly Confident	Neither Confident or Unconfident	Fairly Unconfident	Very Unconfident

Do you think there was more or less information in this paragraph then you were asked for in the questionnaire (circle)?

Much More	A little more	About the same	A little less	Much less

The taller of the robbers walks into the main bedroom. He opens the door and looks around, then goes into another room, where he gets a backpack. He then goes up to the bedside table. He opens all the drawers but does not take anything. He then opens the wardrobe. The wardrobe has three doors, two that come together, and one that opens separately. He opens the first two, closes them, and opens the third. Behind the third door are some drawers. He takes the top one out and empties the chocolate bars *(socks, stockings, tennis balls, photos, nothing)* on the bed.

How confident do you think the person that wrote this was in his or her own memory? (Circle)

Very Confident	Fairly Confident	Neither Confident or Unconfident	Fairly Unconfident	Very Unconfident

Do you think there was more or less information in this paragraph then you were asked for in the questionnaire (circle)?

Much More	A little more	About the same	A little less	Much less

The robber in the main bedroom then goes to a chest of drawers. He opens and the second and third drawers, but doesn't take anything. On top of the drawers are some handbags. He opens a couple and takes a ladies wallet from one, which he then puts in his bag. He then goes to the dressing table. He opens a couple of drawers and goes through them, but doesn't take anything from them. From on top of the dressing table he takes a box of tissues *(religious picture, box of jewellery, prescription medication, gold clock, nothing)*.

How confident do you think the person that wrote this was in his or her own memory? (Circle)

Very Confident	Fairly Confident	Neither Confident or Unconfident	Fairly Unconfident	Very Unconfident

Do you think there was more or less information in this paragraph then you were asked for in the questionnaire (circle)?

Much More	A little more	About the same	A little less	Much less

The shorter robber enters the lounge. He goes straight up to a cabinet and opens the doors. He looks in the cabinet and reaches in to see if there is anything worth taking in there. He then moves around the room, first going to the couch, then a small table. He then picks a laptop off a coffee table that also has a lace mat with a pot plant *(vase of flowers, blender, gnome, bottle of wine, nothing)* on it. He picks up a black backpack and puts the laptop in it, before walking out of the room.

How confident do you think the person that wrote this was in his or her own memory? (Circle)

Very Confident	Fairly Confident	Neither Confident or Unconfident	Fairly Unconfident	Very Unconfident

Do you think there was more or less information in this paragraph then you were asked for in the questionnaire (circle)?

Much More	A little more	About the same	A little less	Much less

The taller robber goes into the bathroom. Sitting next to the basin is a bar of soap *(face cream, jar of coffee, baby wipes, pen holder, nothing)*. There is a hand towel hanging near the basin, and some flowers on the bench top near the bath. He opens the cupboard and looks inside. He then opens the drawers and looks in them. He doesn't take anything.

How confident do you think the person that wrote this was in his or her own memory? (Circle)

Very Confident	Fairly Confident	Neither Confident or Unconfident	Fairly Unconfident	Very Unconfident

Do you think there was more or less information in this paragraph then you were asked for in the questionnaire (circle)?

Much More	A little more	About the same	A little less	Much less

The shorter robber is in the living room. He yells out "come here, there's some good stuff" to the other robber. You can't hear what the other robber replies. The shorter robber then takes the DVD player out of the TV cabinet and puts it in his bag. He doesn't do anything to the TV. You can see a clock that has the time as 4:55.

How confident do you think the person that wrote this was in his or her own memory? (Circle)

Very Confident	Fairly Confident	Neither Confident or Unconfident	Fairly Unconfident	Very Unconfident

Do you think there was more or less information in this paragraph then you were asked for in the questionnaire (circle)?

Much More	A little more	About the same	A little less	Much less

The taller robber is going through cupboards in the kitchen. He opens lots of head height cupboards and closes them again. He goes over to the bench top and looks around. There is a bowl on the bench top with several items in it. The robber looks over this and takes the apple *(watch, iPod, lighter, nail polish remover, nothing)* from it. In the kitchen there are several glasses on the bench top and lots of small figurines, some photos, a newspaper, and a vase of flowers. There is also a microwave and a kettle on the bench top, and a built in oven.

How confident do you think the person that wrote this was in his or her own memory? (Circle)

Very Confident	Fairly Confident	Neither Confident or Unconfident	Fairly Unconfident	Very Unconfident

Do you think there was more or less information in this paragraph then you were asked for in the questionnaire (circle)?

Much More	A little more	About the same	A little less	Much less

Both robbers walk into a storage type room. There is a table with lots of clutter on it including stacks of books, a food hamper, moisturiser, a large vase of flowers, a Christmas tree, and mail. There is also a walking frame, a small wine rack, and a cabinet with some crystal items and photos in frames. The robbers both put their backpacks down and start going through drawers. The shorter robber takes something out of a drawer and says to the other “what about this?” The taller robber moves into the corner of the room and picks up a bottle of wine saying “something for a party afterwards”. The shorter robber takes a figurine from the cabinet and tells the other robber “let’s get moving”.

How confident do you think the person that wrote this was in his or her own memory? (Circle)

Very Confident	Fairly Confident	Neither Confident or Unconfident	Fairly Unconfident	Very Unconfident

Do you think there was more or less information in this paragraph then you were asked for in the questionnaire (circle)?

Much More	A little more	About the same	A little less	Much less

They both go into a spare bedroom. In the room you can see a single bed, a chair with a teddy bear *(DVD's, flippers, nothing)* sitting on it, and a dressing table. They start opening the drawers of the dressing table. The shorter robber takes a bottle of perfume out of a drawer and smells it, commenting that they don't want that. On the dressing table there is a crystal clock, a picture, and a crystal bottle. The shorter robber picks up the bottle and takes it with him.

How confident do you think the person that wrote this was in his or her own memory? (Circle)

Very Confident	Fairly Confident	Neither Confident or Unconfident	Fairly Unconfident	Very Unconfident

Do you think there was more or less information in this paragraph then you were asked for in the questionnaire (circle)?

Much More	A little more	About the same	A little less	Much less

As the taller robber opens a door to go into another room the shorter robbers phone starts to ring. He answers it and it is the driver calling to say that one of the neighbours is watching them. The robber replies "don't worry, who cares" *("it's a nice day", "come on, let's go", "tell them to mind their own business", "yep, got it", or nothing)* and then he walks away, with the taller robber behind him. When he takes the phone call he is standing by a table that has a lamp and a vase of flowers on it. There are also some pictures hanging on the wall.

How confident do you think the person that wrote this was in his or her own memory? (Circle)

Very Confident	Fairly Confident	Neither Confident or Unconfident	Fairly Unconfident	Very Unconfident

Do you think there was more or less information in this paragraph then you were asked for in the questionnaire (circle)?

Much More	A little more	About the same	A little less	Much less

Both robbers walk to the front door. In front of the door is a rug, and propped up in the corner is a PVC pipe *(umbrella, walking stick, cricket bat, broom, nothing)*. They open the wooden door easily but you don't see how they get the screen door open. They then walk out into the yard. The driver is sitting in the car and both robbers get in. They then drive down the street.

How confident do you think the person that wrote this was in his or her own memory? (Circle)

Very Confident	Fairly Confident	Neither Confident or Unconfident	Fairly Unconfident	Very Unconfident

Do you think there was more or less information in this paragraph then you were asked for in the questionnaire (circle)?

Much More	A little more	About the same	A little less	Much less

As you read the above paragraphs, did you try to picture the events in your mind (circle)?

Never	Rarely	Sometimes	Often	Always	Don’t Know

As you read the above paragraphs, did you try to think back to the questionnaire questions?

Never	Rarely	Sometimes	Often	Always	Don’t Know

Appendix 7

Initial Questionnaire

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

The film that you watched during the first part of this study showed a house break-in.

Please answer all of the following questions about the film of the break-in. Once you have completed a question, please do not change your answer to that question.

The correct answer to some of the questions is "nothing". If you believe the correct answer is "nothing", please put this as your response.

You must give an answer to every question. DO NOT put "don't know" as an answer. If you cannot recall an answer, please guess what you think the correct answer is. You may guess that "nothing" happened.

Below each question is a space for you to respond with how confident you are in your answer. Please respond by putting a number between 0 and 100 (inclusive).

There are also two rating scales for recollection and familiarity. You can refer to your instruction sheets to answer these parts of the question.

There is no time limit on this phase of the study. Take as much time as you need. Once you have completed the questionnaire, please hand this to the researcher who will give you information on what to do next.

If you have any questions at any stage during the study, please feel free to ask the researcher.

Gender (Circle): **Male** **Female**

Age: _____ years

Correct in self-test: _____/4

1. What is sitting next to the letterbox[14]?

_____

Recollection					
(You recollect some specific details of this item from the FILM)					
1–––––––2–––––––3–––––––4–––––––5–––––––6					
Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

Familiarity					
(You know the item was in the FILM because it feels familiar)					
1–––––––2–––––––3–––––––4–––––––5–––––––6					
Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

How confident are you that your response is correct? _____ %

[14] Two questions were shown on each page, with space to record their answer.

2. What is the number of the house (from the letter box)?

_____

Recollection

(You recollect some specific details of this item from the FILM)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

Familiarity

(You know the item was in the FILM because it feels familiar)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

How confident are you that your response is correct? _____ %

3. What colour hooded jacket is the getaway driver wearing?

_____

Recollection

(You recollect some specific details of this item from the FILM)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

Familiarity

(You know the item was in the FILM because it feels familiar)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

How confident are you that your response is correct? _____ %

4. Who does the robber say live in the house?

_____

Recollection

(You recollect some specific details of this item from the FILM)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

Familiarity

(You know the item was in the FILM because it feels familiar)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

How confident are you that your response is correct? _____ %

5. What is hanging on the clothesline near the side door that the robbers break in?

_____

Recollection

(You recollect some specific details of this item from the FILM)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

Familiarity

(You know the item was in the FILM because it feels familiar)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

How confident are you that your response is correct? _____ %

6. What is propped in the corner by the door where the robbers break in?

_____

Recollection

(You recollect some specific details of this item from the FILM)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

Familiarity

(You know the item was in the FILM because it feels familiar)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

How confident are you that your response is correct? _____ %

7. What tool does the robber use to try and force the door open?

_____

Recollection

(You recollect some specific details of this item from the FILM)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

Familiarity

(You know the item was in the FILM because it feels familiar)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

How confident are you that your response is correct? _____ %

8. What colour hair does the taller robber have?

_____

Recollection

(You recollect some specific details of this item from the FILM)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

Familiarity

(You know the item was in the FILM because it feels familiar)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

How confident are you that your response is correct? _____ %

9. What type of top is the taller robber wearing?

_____

Recollection

(You recollect some specific details of this item from the FILM)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

Familiarity

(You know the item was in the FILM because it feels familiar)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

How confident are you that your response is correct? _____ %

10. What does the robber tip out of a draw onto the bed?

_____

Recollection

(You recollect some specific details of this item from the FILM)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

Familiarity

(You know the item was in the FILM because it feels familiar)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

How confident are you that your response is correct? _____ %

11. What does the robber take from the bag on the draws?

_____

Recollection

(You recollect some specific details of this item from the FILM)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

Familiarity

(You know the item was in the FILM because it feels familiar)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

How confident are you that your response is correct? _____ %

12. What does the taller robber steal from the dressing table?

_____

Recollection

Recollection

(You recollect some specific details of this item from the FILM)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

Familiarity

(You know the item was in the FILM because it feels familiar)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

How confident are you that your response is correct? _____ %

13. What colour hair does the shorter robber have?

_____

Recollection

(You recollect some specific details of this item from the FILM)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

Familiarity

(You know the item was in the FILM because it feels familiar)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

How confident are you that your response is correct? _____ %

14. What type of top is the robber that goes into the lounge wearing?

_____

Recollection

(You recollect some specific details of this item from the FILM)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

Familiarity

(You know the item was in the FILM because it feels familiar)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

How confident are you that your response is correct? _____ %

15. What is sitting on the lace mat on the coffee table, next to the laptop that the robber steals?

_____

Recollection

(You recollect some specific details of this item from the FILM)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

Familiarity

(You know the item was in the FILM because it feels familiar)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

How confident are you that your response is correct? _____ %

16. Into what type of bag did the robber put the laptop?

_____

Recollection

(You recollect some specific details of this item from the FILM)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

Familiarity

(You know the item was in the FILM because it feels familiar)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

How confident are you that your response is correct? _____ %

17.What is sitting next to the basin in the bathroom?

_____

Recollection

(You recollect some specific details of this item from the FILM)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

Familiarity

(You know the item was in the FILM because it feels familiar)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

How confident are you that your response is correct? _____ %

18.What does the robber from the lounge yell out to the other robber?

_____

Recollection

(You recollect some specific details of this item from the FILM)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

Familiarity

(You know the item was in the FILM because it feels familiar)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

How confident are you that your response is correct? _____ %

19.What time does the robbery happen (on the clock)?

_____

Recollection

(You recollect some specific details of this item from the FILM)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

Familiarity

(You know the item was in the FILM because it feels familiar)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

How confident are you that your response is correct? _____ %

20. What does the robber take from the bowl on the kitchen bench top?

_____

Recollection

(You recollect some specific details of this item from the FILM)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

Familiarity

(You know the item was in the FILM because it feels familiar)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

How confident are you that your response is correct? _____ %

21. What does the taller robber steal "for a party afterwards"?

_____

Recollection

(You recollect some specific details of this item from the FILM)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

Familiarity

(You know the item was in the FILM because it feels familiar)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

How confident are you that your response is correct? _____ %

22.In the spare bedroom that both robbers go into, what is sitting on the chair in the corner?

_____

Recollection

(You recollect some specific details of this item from the FILM)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

Familiarity

(You know the item was in the FILM because it feels familiar)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

How confident are you that your response is correct? _____ %

23. On the dressing table that both robbers look through, what does the shorter robber take?

_____

Recollection

(You recollect some specific details of this item from the FILM)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

Familiarity

(You know the item was in the FILM because it feels familiar)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

How confident are you that your response is correct? _____ %

24. When the getaway driver calls the robber to warn him about someone watching, what does the robber reply?

_____

Recollection

(You recollect some specific details of this item from the FILM)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

Familiarity

(You know the item was in the FILM because it feels familiar)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

How confident are you that your response is correct? _____ %

25. What is the robber doing while the other robber is on the phone?

_____

Recollection

(You recollect some specific details of this item from the FILM)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

Familiarity

(You know the item was in the FILM because it feels familiar)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

How confident are you that your response is correct? _____ %

26. What is sitting propped up next to the inside of the front door as the robbers start to leave the house?

_____

Recollection

(You recollect some specific details of this item from the FILM)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

Familiarity

(You know the item was in the FILM because it feels familiar)

1–––––––2–––––––3–––––––4–––––––5–––––––6

Definitely No	Probably No	Guess No	Guess Yes	Probably Yes	Definitely Yes

How confident are you that your response is correct? _____ %

Appendix 8

Final Questionnaire

IMPORTANT: PLEASE READ THE INSTRUCTIONS CAREFULLY

During the initial stage of this study, you watched a film of a house break-in. It is important that you answer this questionnaire with your memory of the FILM.

Once you have completed a question, please do not change your answer to that question.

You must give an answer to every question. DO NOT put "don't know" as an answer. If you cannot recall an answer, please guess what you think the correct answer is. You may guess that "nothing" happened.

Below each question is a scale for you to rate your confidence in your answer. Please circle one rating that shows how confident you are that your answer is correct.

There is no time limit on this phase of the study. Take as much time as you need. Once you have completed the questionnaire, please hand this to the researcher who will give you information on what to do next.

If you have any questions at any stage during the study, please feel free to ask the researcher.

Appendix 9

Proportion of Conforming Items, and Confidence means (SD) by Centrality, Post-Event Information Schema, and Critical Item

		Accuracy				Confidence			
	Film	**A and B**		**C and D**		**A and B**		**C and D**	
Centrality	**Critical Item**	**Typical**	**Atypical**	**Typical**	**Atypical**	**Typical**	**Atypical**	**Typical**	**Atypical**
Central	**Colour of Driver's Jacket**	.90	1.00	.44	.95	80.00 (18.71)	95.53 (11.17)	75.83 (17.68)	91.42 (16.16)
	Tool Used to Break In	*.93*	*1.00*	*1.00*	*.93*	*91.97 (20.29)*	*99.69 (3.05)*	*98.70 (8.32)*	*98.36 (3.89)*
	Stolen From Bowl	.88	.79	.94	.78	90.29 (28.03)	87.94 (28.18)	100.00 (0.00)	75.03 (34.25)
	Reply to Phone Call	.44	.75	.05	.85	43.11 (34.70)	69.47 (34.18)	42.50 (24.99)	71.67 (20.86)
Peripheral	**Item on Clothesline**	.37	.77	.32	.28	43.35 (37.70)	82.04 (29.26)	53.33 (35.65)	56.42 (29.57)
	Steal From Dressing Table	.74	.25	.57	.21	81.99 (28.76)	65.84 (33.59)	72.81 (28.23)	60.64 (34.66)
	Lace Mat on Coffee Table	.41	.41	.06	.47	45.98 (34.29)	54.44 (38.58)	38.64 (28.01)	68.59 (33.85)
	Sitting Next to Basin	.20	.16	.11	.16	44.69 (36.31)	31.27 (34.67)	39.92 (33.79)	35.54 (26.31)
	Propped in Corner	.19	.00	.30	.26	36.61 (38.47)	17.76 (21.08)	28.99 (27.78)	37.88 (37.74)
	Total	.53	.51	.35	.49	58.62 (37.56)	62.95 (38.31)	55.54 (34.10)	61.80 (33.79)

Note: The totals do not include the item in italics, which was excluded from further analyses

Appendix 10

Initial Questionnaire

IMPORTANT: PLEASE READ THESE INSTRUCTIONS CAREFULLY

During the initial stage of this study you watched a film of a house break-in. Please complete the following questionnaire about your memory of the film.

Please circle one answer only to each question.

It is important that you answer all questions, even if you guess the answer.

If you do not believe the correct answer is give, please circle "None of the above". Please only circle this if you do not believe the correct answer is given, if you are unsure about the answer please choose your best guess.

Below each question is a scale for you to rate your confidence in your answer. Please circle one rating that shows how confident you are that your answer is correct.

There is no time limit on this phase of the study. Take as much time as you need. Once you have completed the questionnaire, please hand this to the researcher who will give you information on what to do next.

If you have any questions at any stage during the study, please feel free to ask the researcher.

Gender (Circle): **Male** **Female**

Age: _____ years

1. What is sitting next to the letterbox?

a) A wine bottle
b) A pot plant
c) A delivery box
d) A garden gnome
e) None of the above

How sure are you that your response is correct? (Please circle)

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Extremely Unsure — Extremely Sure

2. What colour hooded jacket is the getaway driver wearing?

a) Red
b) Black
c) Yellow
d) Brown
e) None of the above

How sure are you that your response is correct? (Please circle)

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Extremely Unsure — Extremely Sure

3. Who does the robber say live in the house?

a) A young lady
b) A young man
c) An elderly lady
d) An elderly man
e) None of the above

How sure are you that your response is correct? (Please circle)

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Extremely Unsure — Extremely Sure

4. What is hanging on the clothesline near the side door that the robbers break in?

a) Red jeans
b) A sheet
c) A long black skirt
d) A black mini-skirt
e) None of the above

How sure are you that your response is correct? (Please circle)

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Extremely Unsure — Extremely Sure

5. What is propped in the corner by the door where the robbers break in?

a) A mop
b) A shovel
c) A tree branch
d) A baseball bat
e) None of the above

How sure are you that your response is correct? (Please circle)

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Extremely Unsure — Extremely Sure

6. What tool does the robber use to try and force the door open?

a) A crowbar
b) A paint brush
c) A screwdriver
d) A tape measure
e) None of the above

How sure are you that your response is correct? (Please circle)

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Extremely Unsure — Extremely Sure

7. What colour jumper is the taller robber wearing?

a) Black
b) Red
c) Khaki
d) Blue
e) None of the above

How sure are you that your response is correct? (Please circle)

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Extremely Unsure										Extremely Sure

8. What does the robber take from the drawers next to the door?

a) A handbag
b) A purse
c) A book
d) A doll
e) None of the above

How sure are you that your response is correct? (Please circle)

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Extremely Unsure										Extremely Sure

9. What does the taller robber steal from the dressing table?

a) A jewellery box
b) A box of tissues
c) A religious picture
d) Perfume
e) None of the above

How sure are you that your response is correct? (Please circle)

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Extremely Unsure — Extremely Sure

10. What colour jacket is the robber that goes into the lounge wearing?

a) Grey
b) Green
c) Orange
d) Navy
e) None of the above

How sure are you that your response is correct? (Please circle)

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Extremely Unsure — Extremely Sure

11. What is sitting on the lace mat on the coffee table, next to the laptop that the robber steals?

a) A pot plant
b) A garden gnome
c) A vase of flowers
d) A blender
e) None of the above

How sure are you that your response is correct? (Please circle)

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Extremely Unsure — Extremely Sure

12. What is sitting next to the basin in the bathroom?

a) A jar of coffee
b) Face cream
c) Hand wash
d) A pen holder
e) None of the above

How sure are you that your response is correct? (Please circle)

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Extremely Unsure — Extremely Sure

13. What time does the robbery happen (on the clock)?

a) 6:55
b) 3:35
c) 4:55
d) 9:25
e) None of the above

How sure are you that your response is correct? (Please circle)

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Extremely Unsure — Extremely Sure

14. What does the robber take from the bowl on the kitchen bench top?

a) A silver watch
b) An apple
c) A bottle of nail polish remover
d) An iPod
e) None of the above

How sure are you that your response is correct? (Please circle)

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Extremely Unsure — Extremely Sure

15. In the spare bedroom that both robbers go into, what is sitting on the chair in the corner?

a) Some books
b) A teddy bear
c) A stack of DVDs
d) A pair of flippers
e) None of the above

How sure are you that your response is correct? (Please circle)

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Extremely Unsure — Extremely Sure

16. When the getaway driver calls the robber to warn him about someone watching, what does the robber reply?

a) "It's a nice day"
b) "Ok, we're done"
c) "Don't worry, who cares"
d) "Come on, let's go"
e) None of the above

How sure are you that your response is correct? (Please circle)

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Extremely Unsure — Extremely Sure

17. What is the robber doing while the other robber is on the phone?

a) Going through drawers

b) Looking into another room

c) Looking at the robber on the phone

d) Having a drink

e) None of the above

How sure are you that your response is correct? (Please circle)

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Extremely Unsure — Extremely Sure

18. What is sitting propped up next to the inside of the front door as the robbers start to leave the house?

a) A walking stick

b) A cricket bat

c) A PVC pipe

d) An umbrella

e) None of the above

How sure are you that your response is correct? (Please circle)

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Extremely Unsure — Extremely Sure

Appendix 11

Debrief Information

You are currently participating in a memory study; however this study is not just about the answers you have given in the questionnaires, we are interested in how and why you chose those answers. During the next section, you will be asked to complete a series of questions about your experience today. These questions will be given to you in a separate booklet by the researcher. Before this, it is important for you to understand why we are asking these questions. Please read the following information carefully. If you have any additional questions at the end of the study the researcher will be happy to answer them.

During pilot testing of the current study overall accuracy for the questionnaires was taken. On average participants were accurate on 60% of the questions, although this ranged from 20% to 90% for each question. No one was accurate on 100% of questions. This means that when your questionnaire is scored, chances are that you will also be incorrect on some of the items.

We are currently trying to determine how participants choose to report a detail when they are forced to give an answer. Confidence ratings are often a good indication of whether an answer is accurate, but this is not a fool-proof system. The next section of the study is designed to elicit further information about your memory, in conjunction with the questionnaires you have already completed.

Appendix 12

Discrepancy Detection Questionnaire[15]

Please do not read through the questions before you start. It is important that you answer each question fully before moving on to the next question. You may refer back to a question if you wish.

1. During the narrative it is possible you read items that you had not remembered, or that were different to how you remembered them. Please record all of these items below.

2. You have now reported the differences you noticed between the film and the narrative. Please report when you noticed these differences (e.g. when you read them, when you answered the questionnaire, when you were asked about this in question one, or something else).

3. When you noticed the differences you gave in question one, what did you think about them?

4. During the final questionnaire you were asked either about the film or the narrative. How did you go about recalling an answer for the questionnaire? If you noticed there were differences between the film and narrative items, how did you decide which to report?

5. Sometimes it is easier to remember when you have the questionnaire in front of you. The researcher will now give you your final questionnaire back. Please mark any questions that you remember the film and narrative being different (without changing your original answer). Please also report what the other item is.

6. At the start of the study you were told this was a standard memory test, however this is not the true aim. Please describe in your own words what you believe the aim of this study is (if you think there are multiple aims, or can't decide what the true aim is you may report several).

[15] Each question was given on a new page with space to write underneath.