



University of HUDDERSFIELD

University of Huddersfield Repository

Mojtahedi, Dara

Investigating the effects of co-witness influence on blame attribution.

Original Citation

Mojtahedi, Dara (2018) Investigating the effects of co-witness influence on blame attribution. Doctoral thesis, The University of Huddersfield.

This version is available at <http://eprints.hud.ac.uk/id/eprint/34641/>

The University Repository is a digital collection of the research output of the University, available on Open Access. Copyright and Moral Rights for the items on this site are retained by the individual author and/or other copyright owners. Users may access full items free of charge; copies of full text items generally can be reproduced, displayed or performed and given to third parties in any format or medium for personal research or study, educational or not-for-profit purposes without prior permission or charge, provided:

- The authors, title and full bibliographic details is credited in any copy;
- A hyperlink and/or URL is included for the original metadata page; and
- The content is not changed in any way.

For more information, including our policy and submission procedure, please contact the Repository Team at: E.mailbox@hud.ac.uk.

<http://eprints.hud.ac.uk/>

**INVESTIGATING THE EFFECTS OF CO-WITNESS
INFLUENCE ON BLAME ATTRIBUTION**

DARA MOJTAHEDI

A thesis submitted to the University of Huddersfield in partial fulfilment of the
requirements for the degree of Doctor of Philosophy

The University of Huddersfield

May 2018

Copyright statement

- i. The author of this thesis (including any appendices and/or schedules to this thesis) owns any copyright in it (the "Copyright") and s/he has given The University of Huddersfield the right to use such copyright for any administrative, promotional, educational and/or teaching purposes.
- ii. Copies of this thesis, either in full or in extracts, may be made only in accordance with the regulations of the University Library. Details of these regulations may be obtained from the Librarian. This page must form part of any such copies made.
- iii. The ownership of any patents, designs, trademarks and any and all other intellectual property rights except for the Copyright (the "Intellectual Property Rights") and any reproductions of copyright works, for example graphs and tables ("Reproductions"), which may be described in this thesis, may not be owned by the author and may be owned by third parties. Such Intellectual Property Rights and Reproductions cannot and must not be made available for use without the prior written permission of the owner(s) of the relevant Intellectual Property Rights and/or Reproductions

Abstract

Through the use of misinformation paradigms, research has demonstrated that eyewitnesses can be influenced by their co-witnesses when attempting to attribute blame to the correct person in incidents where there are multiple potential suspects at blame (such as a fight or car accident). The act of *blame conformity* could directly contribute to the false conviction of innocent bystanders and should therefore be a central focus for research. Yet very little research has attempted to investigate the moderating factors associated with blame conformity. The present thesis investigated the effects of co-witness influence on eyewitness blame attribution. More specifically, the thesis sought to identify the external and internal predictors of blame conformity. A similar experimental paradigm to Thorley (2015) was created to observe blame conformity. In the present studies, confederates were used to expose participants to misleading post-event information about the witnessed crime footage (suggesting that the wrong person had initiated the assault). Participants were then interviewed and asked if they could determine which person from the incident was to blame for initiating the assault. A series of internal and external variables were measured and manipulated to identify the most accurate predictors of blame conformity. In total, four studies were carried out: The studies investigated the effects of age and gender (study 1a); unanimity and group size of misinformation (study 1b; using same data as 1a); personality characteristics (FIRO-B assessment)(study 2); co-witness familiarity (study 3); and the perceived intelligence and authority of the misinformation source (study 4), on co-witness influence.

The results found no significant age or gender-related differences in blame conformity. In relation to personality; the results suggested eyewitnesses who scored highly on the wanted control dimension were more likely to accept misinformation from co-witnesses, and were more likely to lose confidence in their own judgements after a group discussion. Results also indicated that participants were more vulnerable to co-witness influence when exposed to misinformation from a majority of co-witnesses. Misinformation presented by an individual confederate did not have a significant influence on participants' responses. It was found that the level of statement similarity with regard to blame attribution was higher when the co-witnesses had a pre-existing relationship. Results indicated that participants were also more likely to conform to the confederate if she was presented as having high intelligence, in comparison to a confederate whose personal characteristics were undisclosed. After controlling for perceived intelligence, the perceived authority of the confederate did not have a significant effect on their influence over the participants. The implications and practical applications of the findings — as well as directions for future research— are discussed within the thesis.

Table of Contents

Contents

Abstract	3
Table of Contents	4
List of Tables	12
List of Figures	14
Dedications and Acknowledgements.....	15
Chapter 1: Introduction.....	16
1.1. The issue with co-witness influence	16
1.2. The current work.....	20
Chapter 2: The Effects of Post-Event Information on Eyewitness Memory	21
2.1. Introduction to post-event information and the misinformation effect	21
2.2. Sources of misinformation	22
2.2.1. Misinformation from co-witnesses	22
2.2.2. Misinformation from interviewers.....	23
2.2.3. Misinformation from media reports	24
2.2.3. Comparing the different sources of post-event information	24
2.3. Causes of misinformation acceptance	26
2.3.1. Demand characteristics	26
2.3.2. Source monitoring errors.....	29
2.3.3. Comparing the causes of misinformation acceptance.....	33
Chapter 3: Co-witness Influence.....	35
3.1. Co-witness discussions.....	35
3.2. A theoretical model of co-witness influence	39
3.2.1. History of social conformity research.....	39
3.2.2. Normative VS informational influence.....	40
3.3. Measuring co-witness influence in a laboratory setting	43
3.3.1. Collaborative recall paradigm	43
3.3.2. Social contagion of memory paradigm.....	44

3.3.3. Memory conformity paradigm.....	45
3.4. Empirical research findings.....	46
3.4.1. Memory conformity.....	47
3.4.2. Interpreting the event and blame conformity	50
3.4.3. Eyewitness confidence.....	53
3.4.4. The effects of group discussion on memory recall	54
Chapter 4: Factors Influencing Memory Conformity.....	57
4.1. General introduction to the chapter	57
4.2. Gender-related differences in co-witness suggestibility.	58
4.2.1. Informational influence.....	58
4.2.2. Source monitoring	62
4.2.3. Interpersonal behaviour and normative influence.....	62
4.2.4. Research on gender and memory conformity	63
4.2.5. Limitations of previous research	64
4.3. Age-related differences in co-witness suggestibility	65
4.3.1. Informational influence.....	66
4.3.2. Source monitoring	69
4.3.3. Research on age and memory conformity	69
4.3.4. Limitations of previous research: Age as a nominal variable	70
4.4. Personality and Co-witness suggestibility	71
4.4.1. Personality and misinformation acceptance	71
4.4.2. Interpersonal characteristics and co-witness suggestibility.....	74
4.4.3. Predicting co-witness suggestibility	75
4.4.4. Limitations of previous research	77
4.5. Group size and co-witness suggestibility	78
4.5.1. Prevalence of pair studies within the existing literature.....	79
4.5.2. Misinformation size	80
4.5.3. Unanimity of misinformation	87
4.6. Co-witness familiarity	89

4.7. Co-witness characteristics	92
4.7.1. Perceived competence.....	94
4.7.2. Perceived status and authority	95
4.7.3. Informational and Normative pressures	96
Chapter 5: Introduction to the Experimental Chapters.....	98
5	98
.1. The empirical studies.....	98
5.1.1. Study 1a: Gender & age effects on co-witness suggestibility	98
5.1.2. Study 1b: Group size and co-witness influence.....	99
5.1.3. Study 2: Personality and co-witness suggestibility	99
5.1.4. Study 3: Co-witness familiarity and co-witness influence	99
5.1.5. Study 4: The impacts of perceived competence on co-witness influence.....	100
5.1.6. Multiple comparisons of data for studies one (a & b) and two	100
5.2. Methodological Considerations	101
5.2.1. Sampling.....	101
5.2.2. Stimulus materials.....	103
5.2.3. General design and procedure.....	106
5.3. Ethical considerations	108
Chapter 6 Study 1a: Gender & Age Effects on Co-Witness Suggestibility.....	110
6.1. Introduction	110
6.1.1. Gender-related differences in co-witness suggestibility.....	110
6.1.2. Age-related differences in co-witness suggestibility.....	111
6.2. Present study	111
6.3. Methodology.....	113
6.3.1. Participants.....	113
6.3.2. Design	113
6.3.3. Materials	115
6.3.4. Procedure	115
6.4. Results	116

6.4.1. Control group	119
6.4.2. Blame attribution.....	122
6.4.3. Eyewitness confidence in blame attribution	124
6.5. Discussion	126
6.5.1. Gender and co-witness suggestibility in blame attribution	127
6.5.2. Age and co-witness suggestibility in blame attribution	129
6.5.3. Misinformation and overconfidence	130
6.5.4. Limitations and directions for future research	131
6.5.5. Summary	132
Chapter 7: Study 1b: Group Size and Co-Witness Influence.....	133
7.1. Introduction	133
7.1.1. Misinformation size	133
7.1.2. Unanimity of misinformation	134
7.2. Present study	135
7.3. Methodology.....	136
7.3.1. Participants.....	136
7.3.2. Design & procedure	136
7.3.3. Materials	137
7.4. Results	137
7.4.1. General descriptive data	137
7.4.2. The effects of confederate size and unanimity on blame conformity	139
7.4.3. The effects of confederate size and unanimity on confidence	142
7.5. Discussion.....	142
7.5.1. Misinformation size and blame conformity	143
7.5.2. Unanimity of misinformation and blame conformity.....	145
7.5.3. Misinformation size, unanimity and confidence	146
7.5.4. Implications	146
7.5.5. Limitations and directions for future research	147
7.5.6. Summary	148

Chapter 8: Study 2: Personality and Co-witness Suggestibility	149
8.1. Introduction	149
8.1.1. Personality correlates of eyewitness suggestibility.....	149
8.2. Present study	150
8.3. Methodology	151
8.3.1. Participants.....	151
8.3.2. Measures and Materials	152
8.3.3. Design	153
8.3.4. Procedure	154
8.4. Results	155
8.4.1. Predicting eyewitness suggestibility through response accuracy.....	157
8.4.2. Predicting eyewitness suggestibility, through eyewitness confidence	162
8.5. Discussion	166
8.5.1. FIRO-B and blame conformity	167
8.5.2. FIRO-B and eyewitness confidence.....	171
8.5.3. Group size	172
8.5.4. Implications of results	172
8.5.5. Limitations and directions for future research.	174
8.5.6. Conclusion	175
Chapter 9: Study 3: The Effects of Co-Witness Familiarity on Blame Conformity ..	176
9.1. Introduction	176
9.1.2. Building on the existing research on co-witness familiarity.....	177
9.2. Present study	178
9.3. Methodology	179
9.3.1. Participants.....	179
9.3.2. Design & procedure	180
9.3.3. Materials	180
9.3.4. Coding	181
9.4. Results	181

9.4.1. Descriptive data	181
9.4.2. Unanimity of group statements	182
9.4.3. Eyewitness blame attribution accuracy	183
9.5. Discussion	184
9.5.1. Co-witness influence between strangers	184
9.5.2. Co-witness influence between familiar eyewitnesses.	186
9.5.3. Post-event discussion and eyewitness accuracy	187
9.5.4. Limitations and directions for future research	188
9.5.5. Conclusion	189
Chapter 10: Study 4: Perceived Competence and Co-witness Influence	190
10.1. Introduction.....	190
10.1.1. Perceived competence	190
10.1.2. Perceived status and authority.....	191
10.2. Present study.....	191
10.3. Methodology	193
10.3.1. Participants.....	193
10.3.2. Design.....	194
10.3.3. Confederates.....	195
10.3.4. Materials.....	195
10.3.5. Procedure	196
10.4. Results.....	196
10.4.1. Blame conformity.....	198
10.4.2. Confidence	200
10.5. Discussion	203
10.5.1. Intelligence and co-witness influence.....	204
10.5.2. Authority versus intelligence	205
10.5.3. Co-witness influence on confidence	207
10.5.4. Limitations and directions for future research	208
10.5.5. Conclusion	209

Chapter 11: General Discussion.....	210
11.1. Introduction.....	210
11.2. Summary of main findings.....	211
11.3. Discussion of main findings.....	215
11.3.1. Are the effects of co-witness discussions necessarily negative?.....	217
11.3.2. Gender and age-related differences.....	218
11.3.3. Personality correlates of co-witness suggestibility	219
11.3.4. Co-witness familiarity	220
11.3.5. Perceptions of the information source	221
11.3.6. Misinformation size and unanimity	222
11.3.7. Confidence as a measure of co-witness influence	224
11.4. Real life applicability of findings.....	225
11.5. Limitations and directions for future research.....	228
11.5.1. No filler tasks administrated.....	228
11.5.2. Singular measure for blame conformity	229
11.5.3. The time interval between witnessing an incident and giving evidence	230
11.5.4. Controlling for speaking order during the group discussion.....	230
11.5.5. Skewed sample size	231
11.5.6. Interviewing techniques.....	231
11.5.7. Recording the responses of participants before the group discussion ..	232
11.5.8. Controlling for the participants' ethnicity and education	232
11.5.9. Peripheral errors during the blame attribution task.....	233
11.6. Conclusion.....	234
References	236
Appendices	284
Appendix 1. Pre-experiment instruction sheets.....	284
A. True participant sheet.....	284
B. Confederate sheet.....	285
Appendix 2. Information sheet, consent form and debrief sheet.....	286

A.	Information sheet.	286
B.	Consent form.....	290
C.	Debrief sheet.....	291
	Appendix 3. Evidence of SREP approval	292
	Appendix 4. Interview script.....	292
	Appendix 5. Fundamental Interpersonal Relations Orientation-Behaviour Scale .	293

List of Tables

Table 5.1 Percentage of participant's blame attribution accuracy within pilot.....	105
Table 6.1 Frequencies for experimental conditions (N=608).....	114
Table 6.2. Distribution of responses within all conditions.	117
Table 6.3 Means and standard deviations of age for all conditions and responses.	118
Table 6.4. Means and standard deviations of confidence.....	119
Table 6.5. Multinomial logistic regression predicting blame attribution.....	121
Table 6.6. Linear Regression Model of eyewitness confidence.	121
Table 6.7. Multinomial logistic regression predicting blame attribution.....	123
Table 6.8. Multinomial logistic regression predicting blame attribution.....	124
Table 6.9. Descriptive statistics, reliability, and correlations.....	125
Table 7.1. Descriptive statistics for participant responses	138
Table 7.2. Descriptive statistics for conditions in relation to confederate size.	138
Table 7.3. Descriptive statistics and correlations for all continuous variables	138
Table 7.4. Multinomial logistic regression predicting response accuracy.....	140
Table 8.1. Participant information for each experimental condition.....	154
Table 8.2. Means and standard deviations of FIRO-B scales for all conditions	156
Table 8.3. Descriptive statistics, and correlations for all continuous variables	157
Table 8.4. Multinomial logistic regression predicting response accuracy.....	160
Table 8.5. Multinomial logistic regression predicting response accuracy.....	161
Table 8.6. Hierarchical Regression Model of confidence for correct responses.	163
Table 8.7. Hierarchical Regression Model of confidence for correct responses.	164
Table 8.8. Hierarchical Regression Model of confidence for incorrect responses. ...	165
Table 8.9. Hierarchical Regression Model of confidence for incorrect responses. ...	166

Table 9.1. Percentage of blame attribution accuracy between conditions.	182
Table 9.2. Descriptive data for average statement similarity within groups.	182
Figure 9.1 Mean percentage of group statement similarity.	183
Table 10.1. Distribution of eyewitness responses between conditions ($N=193$).....	197
Table 10.2. Mean confidence scores in blame attributions ($N=164$).....	197
Table 10.3. Multinomial logistic regression predicting blame attribution.....	200
Table 10.4. Hierarchical Regression Model of confidence in correct statements.	202
Table 10.5. Hierarchical Regression Model of confidence in incorrect statements. .	203

List of Figures

Figure 5.1:	Experimental stimulus, initial discussion between both men.....	104
Figure 5.2:	Experimental stimulus, the man in the dark green t shirt attacking.....	104
Figure 5.3:	Experimental stimulus, both men being separated after their fight.....	105
Figure 7.1:	Percentage count of participant responses between confederate sizes...	141
Figure 9.1:	Mean percentage of group statement similarity.....	183
Figure 10.1:	Distribution of eyewitness responses between the conditions.....	198

Dedications and Acknowledgements

This thesis is dedicated to my parents, Mitra Asad-Akhtari and Ebrahim Mojtahedi. Was it not for them, this PhD would not have been possible. Their love and support motivated me to push myself and work through those late nights in the office. I would also like to thank my girlfriend Rebecca, for supporting me and providing me with endless cups of tea to get me through those long nights of data analysis.

My supervisors also deserve substantial acknowledgement. Not only did Dr Maria Ioannou and Dr Laura Hammond provide fantastic supervision, but they also helped create an environment for me to excel in. Thank you for guiding me through this journey and more importantly, thank you for helping me gain confidence in myself as an academic member of staff.

Finally, I would like to acknowledge my friend, John Groarke. He did not provide any support or contribution to this PhD and was at times, detrimental to my progression. However, he has been pestering me for the last 3 years to put his name in my acknowledgements, for being "a top mate".

Chapter 1: Introduction

'What a court wants is the independent recollection of the individual witness. It does not want a number of observers to get together and agree among themselves upon a common version' (Heaton-Armstrong, 1987, p.472).

1.1. The issue with co-witness influence

Eyewitnesses play an important role in many police investigations and courtroom decisions (Brewer & Wells, 2011). There are different ways in which eyewitnesses can be used to help drive investigations forward, and ultimately help to identify and convict offenders. Witnesses to crimes can be asked to make an identification, which requires the witness to view a police line-up to see if they can identify the culprit (Brewer & Wells, 2011; Bruer, Harvey, & Adams, 2017; Gronlund, Wixted, & Mickes, 2014). Additionally, many witnesses can be asked to provide an eyewitness statement and subsequent testimony, which requires the eyewitness to recall the event and describe both the peripheral (e.g. colour of the offenders clothing) and central (e.g. the offender's actions) details from the incident (Lindholm, 2008).

The tasks of witness identification and recollection can be seen as dissimilar processes which can be explained through different cognitive models (Kintsch, 1970; Robinson & Johnson, 1996; Pozzulo, Dempsey, Crescini, & Lemieux, 2009; Robinson & Johnson, 1996). During the process of eyewitness identification, witnesses will rely on their recognition memory system to determine whether they can identify the offender within a line-up. Recognition is the process in which the contents of new information (in this case, individuals within the line-up) are compared against the contents of the existing memory to determine whether the new information had previously been encountered (Radvansky, 2017). If there is a clear match, recognition occurs and the individual is likely to make an identification (see Anderson, 2000; Murdock, 1974). However, during the task of eyewitness identification, not only must the witness find the suspect familiar, but the source of the familiarity must be correctly attributed to the criminal event for an identification to be confidently made (Radvansky, 2017).

Whilst eyewitness identification centres heavily on the witness's abilities in facial recognition (Goldstein, Johnson, & Chance, 1979), the process of providing a statement requires witnesses to recall many more aspects of an event (Wright, Gabbert, Memon, &

London, 2006). When given a statement, witnesses will be more reliant on their recollection memory. The *generate-recognize model* of recall (see Anderson & Bower, 1972; Bahrick, 1970; Kintsch, 1970; Radvansky, 2017) posits that — whereas the process of recognition involves simply discriminating new information against old memories — memory recollection is a two-stage process involving the retrieval and recognition of memories: Memory is first recalled through a retrieval process where an individual will use retrieval cues to identify fragments of information for a particular event, from their episodic memory. Then, at the second stage, the individual will use a recognition process to cross-reference the information, identify the correct memories and generate an accurate recollection of the event.

A common assumption made within the criminal justice system is that the identifications and statements given by eyewitnesses will be reliable and independent from those of other witnesses (Brigham & WolfsKeil, 1983; Deffenbacher & Loftus, 1982). Moreover, eyewitnesses are advised that any assertions made should be based on their own experiences and not on information encountered through other sources (Forbes, 2003). However, if an eyewitness discusses the event with other co-witnesses, the issue arises as to whether their own recollection will remain untainted and uninfluenced by the new information.

It must be noted that eyewitnesses do not always witness crimes in groups (Valentin, Pickering & Darling, 2003). However, multiple studies on real eyewitness cases reported that in approximately 83-86% of criminal events multiple eyewitnesses are present (Skagerberg & Wright, 2008a; Wright & McDaid, 1996). Furthermore, Paterson and Kemp's (2006a) survey on real eyewitnesses found that 86% of the respondents admitted to discussing the event with other co-witnesses prior to giving their statements. With such a high proportion of eyewitnesses choosing to discuss the event with their co-witnesses, researchers have been prompted to determine whether such actions can pose a serious risk to the validity of eyewitness testimonies as a reliable and independent form of evidence.

The consequences of co-witness influence have been demonstrated in many publicized cases where false eyewitness testimonies were used. The assassination of Swedish foreign minister, Anna Lindh, in 2003 can be used as a prime example of how collective interviewing can lead to inaccurate eyewitness statements. After the incident, police officers chose to interview several witnesses collectively, to produce a more detailed description of the offender. However, by exposing the witnesses to the reports of their co-witnesses, false information from some of the witnesses had contaminated the statements of others. Consequently, many of the witnesses were influenced into producing false information which lead the investigators into producing an erroneous description of the offender — many

witnesses had later admitted to recalling information that they had heard their co-witnesses report (Granhag, Stromwall & Hartwig, 2005). Loftus, Miller, and Burns (1978) explained that when individuals attempt to report the visual details from a previous experience, verbal information about the event (learned post-event) from their semantic memory could be erroneously integrated as a visual memory and thus, wrongfully reported as witnessed information. This could explain why many witnesses from the Lindh investigation were reporting false information that they had encountered from their co-witnesses within their statements.

Notable cases have also demonstrated the negative impact of co-witness discussions on the process of line-up identification. With regards to the British criminal justice system, one of the biggest miscarriages of justice facilitated by co-witness influence was the Jill Dando murder enquiry in 2001. Initially, most of the eyewitnesses were unable to identify the suspect from an identification parade, apart from one eyewitness who falsely believed that an innocent suspect (Barry George) was the offender. However, after discussing the case with each other during a taxi journey home from the police station, more witnesses became confident that George was the offender they had seen during the event; one eyewitness went from being uncertain to '95% sure' that George was the correct suspect (Gabbert, 2004). The change in their judgements consequently contributed to the wrongful conviction of Barry George. As discussed previously, misleading information from an individual's semantic memory could have an impact on their visual memory about the event (Loftus et al., 1978). With regard to eyewitness identification, Searcy, Bartlett, and Memon (2000) explained that such information could provide witnesses with misleading cues for memory recognition — in that witnesses could misattribute misleading information from their semantic memory as visual memory and as such, identify a suspect based on unwitnessed information about the event.

It is not uncommon for multiple eyewitnesses to identify an innocent person as the offender. The Innocence Project, a non-profit legal organisation devoted to exonerating falsely convicted individuals, found that within a sample of 234 previous cases of eyewitness misidentification within the United States, 38% involved multiple eyewitnesses making the same erroneous judgements (Cardozo, 2009). How can multiple eyewitnesses make the exact same errors when attempting to recall a witnessed event? As with the Jill Dando murder enquiry, it may be that the confidence of one witness may unintentionally influence the memories of other witnesses, leading them to produce a similar account of the event (Goodwin, Kukucka & Hawks, 2012).

Although real-life cases of eyewitness misidentification can offer some indication of the potential dangers of co-witness discussions, more controlled observations on eyewitness

behaviour are needed to determine the true risks of co-witness influence when eyewitnesses engage in post-event discussions. A large body of the current research (discussed in chapter 3) has demonstrated that eyewitnesses are vulnerable to being misled by co-witnesses into reporting false information about an event through giving false statements and also making false identifications (Wright & Gabbert et al., 2006), a phenomenon known as *memory conformity* (Williamson, Weber, & Robertson, 2013; Wright, Self, & Justice, 2000). More worryingly, research has also demonstrated that eyewitnesses can be influenced by co-witnesses when attempting to attribute blame. Thorley (2015) found that participants could be influenced by their co-witnesses into blaming an innocent bystander for committing a crime; a process which the author referred to as *blame conformity*. Such findings provide an explanation for how 38% of misidentification cases reported by the Innocence Project (see Cardozo, 2009), involved multiple eyewitnesses producing the same false testimonies.

Despite evidence suggesting that co-witness influence can significantly impact the reliability of eyewitness evidence, survey reports indicate that practitioners within the criminal justice system still deem it to be a reliable form of evidence for investigating and prosecuting crimes (Coupe & Griffiths, 1996; Kebbell & Wagstaff, 1999; Wells & Olson, 2003). In their survey of 159 police officers, Kebbell and Milne (1998) found that 51% of respondents reported that eyewitness evidence usually provided the major lead in their investigations; a further 33.1% said that it was almost always the major lead, and 2.5% stated that it was always the major lead. Further research suggests that this level of reliance is even greater when investigators are dealing with serious interpersonal crimes, such as stranger rape, serious assault and abduction (Philips & Brown, 1998). As well as police officers, jurors also seem to misjudge the reliability of eyewitness evidence, with reports estimating that 37% of jurors consider the testimony of one eyewitness to be sufficient evidence to warrant a conviction (Simons & Chabris, 2011). Additionally, Schmechel and colleagues found that many jurors failed to understand how external factors could have an impact on the accuracy of eyewitness accounts (Schmechel, O'Toole, Easterly, & Loftus, 2006).

Survey reports indicate that the criminal justice system will continue to place a strong level of reliance on eyewitness evidence, despite research exposing the malleability of human memory to external influence. This is because many crime scenes will often lack DNA-rich biological traces, leaving investigators heavily reliant on any available witnesses to help identify and convict the correct offender (Kebbell & Milne, 1998; Wells & Olson, 2003). Therefore, there is a need for researchers to identify the fundamental causes of co-witness influence, in order to aid investigators in reducing the risks of co-witness contamination. Despite a large body of pre-existing research investigating the effects of co-witness

influence, there seems to be a surprising lack of research attempting to identify the mediating variables that can determine an individual's vulnerability to co-witness influence (otherwise referred to as *co-witness suggestibility*). Research indicates that individual differences in co-witness suggestibility exist, with some eyewitnesses seemingly showing a greater level of susceptibility to co-witness influence than others (Liebman et al., 2002; Patterson, Kemp & Forgas, 2009), yet very little research has attempted to identify what these individual differences are. Why are some individuals more vulnerable to being influenced by their co-witnesses than others? What makes some co-witnesses more influential than others? These fundamental questions form the basis of the present thesis.

1.2. The current work

The current thesis focuses on the effects of co-witness influence on blame attribution (blame conformity), a process of memory recall and decision making which can be severely damaging to an investigation. The studies within the thesis attempt to identify the external and internal predictors of co-witness suggestibility in relation to blame conformity and eyewitness confidence. An experimental memory recall paradigm was designed where participants would witness a criminal event and would later encounter misleading information about the event from their co-witnesses, before giving an individual statement. The paradigm allowed the study to manipulate various environmental factors as well as measuring the individual differences of participants to determine the significant correlates of co-witness suggestibility.

First, to equip the reader with an appropriate understanding of the underlying processes behind co-witness influence, the thesis presents three introductory chapters on post-event information, co-witness discussions, and the mediating variables associated with co-witness suggestibility (memory conformity) – owing to the present studies focussing on the effects of co-witness influence on witness statements, the literature discussed in the subsequent chapters primarily centre around the effects of misinformation on memory recall rather than recognition. The introductory chapters are then succeeded by a series of empirical chapters (introduced in Chapter 5) which discuss the experimental studies that were carried out to fulfil the project's main aim. The final chapter summarises the key findings throughout the studies and discusses some of the main implications that can be drawn from the results.

Chapter 2: The Effects of Post-Event Information on Eyewitness Memory

2.1. Introduction to post-event information and the misinformation effect

After witnessing an incident, an eyewitness may encounter additional information about the event from an external source. This form of information is referred to as *post-event information* (Gabbert, Hope, Fisher, & Jamieson, 2012). Post-event information may contradict the witness's personal recollection of the event, or can provide them with additional details about the event that they may have previously been unaware of (French, Sutherland, & Garry, 2006; Gabbert, 2004; Gabbert, Memon, & Wright, 2006). Interviewers will usually encourage the witnesses to only recall the information that they remember seeing; however, research suggests that many eyewitnesses who encounter misleading post-event information will then incorporate the misinformation into their personal statements (Gabbert, Memon, Allan, 2003; Paterson & Kemp, 2006b). This behaviour is more commonly referred to as *the misinformation effect* (Belli, 1989; Gerrie, Garry, & Loftus, 2005; Loftus, 2005; Loftus & Hoffman, 1989).

Researchers have typically been able to observe the effects of post-event information on eyewitness memory by using the *misinformation paradigm*, an experimental procedure consisting of three stages (see Ayers & Reder, 1998 for review). Participants first witness an incident on a screen (usually a video or collection of images). Sometime after witnessing the event, they are then exposed to misleading information about the event, in the form of misleading questions, a false written narrative of the event, or an erroneous account from another witness. Finally, participants are individually questioned by the interviewer about the witnessed event. Responses are then compared to a control group of participants who have not been exposed to the misinformation, in order to determine whether exposure to misinformation has had a negative effect on the accuracy of the eyewitness's memory report. Studies adopting this paradigm have typically found that participants who were exposed to misinformation were more likely to produce less accurate recollections about the event (Ayers & Reder, 1998; Carlucci, Kieckhafer, Schwartz, Villalba, & Wright, 2010; Dodd & Bradshaw, 1980; Gabbert, Memon, Allan, & Wright, 2004; Garry, French, Kinzett, & Mori, 2008; Greene, Flynn, & Loftus, 1982; Paterson & Kemp, 2006b; Payne, Toglia, & Anastasi, 1994). More specifically, studies suggest that exposure to misinformation can lead to distortions in an eyewitness's memory for items that were genuinely experienced (i.e. correctly remembering that the offender was wearing a hat, but mistaking it for blue when it

was red); as well as causing eyewitnesses to recall seeing items that were not present during the actual event (i.e. the presence of a weapon or second accomplice) (Nourkova, Bernstein, & Loftus, 2004). Findings from the misinformation effect paradigm demonstrate how easily eyewitnesses can incorporate misinformation from external sources into their own memory reports.

2.2. Sources of misinformation

2.2.1. Misinformation from co-witnesses

The most frequent way that eyewitnesses encounter misinformation is through discussions with other co-witnesses (*co-witness discussions*) (Gabbert, 2004; Paterson & Kemp, 2006a). Research suggests that individuals who are present during the same event are likely to hold different recollections of the event afterwards (French, Sutherland, & Garry, 2006; Gabbert, Memon, & Wright, 2006). If co-witnesses hold differing recollections of the event, a group discussion could cause the individual statements of the eyewitnesses to become more similar (Gabbert, Memon, Allan, & Wright, 2004; Mori, 2003; Wright, Self, & Justice, 2000).

The previous real-life examples of co-witness influence discussed in chapter one demonstrated how post-event discussions could have an influence on eyewitness identification, as well as their recollection of the offender's characteristics (statement). However, when giving a statement, eyewitnesses are asked to give more information than just the offender's characteristics. Another way that post-event discussions could influence eyewitness statements is through contaminating their recollection about the incident itself and how it unfolded. A notable case in relation to co-witness misinformation and false testimonies is the 1995 Oklahoma bombing incident. Timothy McVeigh was responsible for detonating a bomb outside a federal building which subsequently killed 168 victims and injured many more. Upon searching for the suspect, the investigators were able to locate the shop that the suspect had used to rent a truck from (which was later used in the attack). Three eyewitnesses had reported having seen McVeigh come into the store they worked at to rent the vehicle. Initially, two of the witnesses had reported only seeing McVeigh get inside the truck, but the third witness (Tom Kessinger) mistakenly believed that a second accomplice was present. However, after discussing the event with each other, all three witnesses suddenly became convinced that a second accomplice was present during the event (Memon & Wright, 1999; Schacter, 2001). This collaborative error caused police officers to exhaust their time and resources looking for a non-existent second

suspect, in what is considered to be one of the most expensive manhunts in U.S. history (Skagerberg & Wright, 2008a).

The effects of co-witness discussions are explored more extensively in chapter three. But first, it is worth discussing how other sources of post-event information can influence eyewitnesses into reporting misinformation. Eyewitnesses can also be exposed to post-event information about the event from interviewers and media reports (Paterson & Kemp, 2006b; Ridley & Clifford, 2004).

2.2.2. Misinformation from interviewers

When interviewing eyewitnesses, police officers and lawyers must be cautious as to what information they reveal to the witness and how they present their questions. This is because the witness's memory can be easily influenced by any information that is presented or even suggested by the interviewer (Zaragoza, Payment, Ackil, Drivdahl, & Beck, 2001). One way in which interviewers can expose witnesses to post-event information is through the intentional or unintentional mention of additional details about the event (Jack, Zydervelt, & Zajac, 2013). Jack et al. (2013) found that participants who were presented with misinformation by the interviewer were susceptible to incorporating the misinformation into their statements later on. Another way in which interviewers can expose witnesses to post-event information is through misleading questions (Beckerian & Bowers, 1983; Loftus, 1979; Loftus, Miller, & Burns, 1978). This effect was notably demonstrated by Loftus and Palmer (1974; study 2), who showed participants ($N=150$) a film depicting a car accident. After watching the footage, participants were then questioned about the event, at which point they were asked about the speed that the cars were traveling at prior to the accident. The wording of this question was altered so that participants from one condition were asked to report how fast the cars were travelling before they 'hit' each other, whilst participants from another condition were asked to report how fast the cars were travelling before they 'smashed' into each other (with the latter implying that the cars were travelling at a faster speed). It was found that participants who were told that the cars had 'smashed' into each other erroneously predicted much higher speeds than those who were told that the cars had 'hit' each other. Additionally, the study found that participants who were told that the cars had 'smashed' into each other were more likely to falsely report seeing broken glass during the accident. The latter observation suggests that misinformation can have a snowballing effect in contaminating an eyewitness's account of an event, by also influencing the way that they interpret the incident.

2.2.3. Misinformation from media reports

During more high-profile criminal investigations, witnesses may later encounter media coverage about the witnessed incident (Gabbert et al., 2012; Paterson & Kemp, 2006b). Exposure to such outlets may provide the witness with additional information about the event, unknown to the individual prior to this exposure. Despite news outlets sometimes being inaccurate in their claims, reports show that the majority of the general public perceive the media to be a credible source for news (Kiousis, 2001). As a result, many witnesses could be susceptible to accepting inaccurate post-event information from news sources and incorporating them into their personal statements. Such an effect of media influence on memory recall was believed to have been present during the McMartin preschool trial (1983-1990), where a preschool run by members of the McMartin family had been charged with numerous acts of sexual abuse of children in their care (Talbot, 2001). Due to the media's skewed portrayal of the event, favouring the viewpoint of the prosecution, it is believed that many victims may have been influenced by media reports when giving their testimonies (Eberle & Eberle, 1993). This led to one of the longest and most expensive criminal trials in American history, which subsequently resulted in all charges being dropped (Reinhold, 1990). Similar effects of media influence and misinformation acceptance have been observed within laboratory settings. Paterson and Kemp (2006b), for example, investigated the effects of encountering post-event information through media outlets, finding that participants who were exposed to inaccurate news reports after viewing a crime were more confident in their incorrect recollections than participants that had not encountered the post-event information.

2.2.3. Comparing the different sources of post-event information

Paterson and Kemp (2006b) compared the effects of misinformation from different sources of post-event information on memory recall. Participants ($N=105$) were shown footage of a crime. One week later, they were called back in and each participant was presented with misinformation about the event from one of four different sources. Participants encountered the misinformation through either a false news article; a misleading questionnaire; indirect co-witness information (participants were presented with the written statement from a previous participant); or direct co-witness information, through a post-event discussion with an experimental confederate (introduced as a fellow

participant). In addition to the four experimental conditions, there was also a control group where participants were not exposed to any form of post-event information. The researchers then interviewed the participants privately to determine how influential each source of post-event information was in relation to misinformation acceptance. The results indicated that post-event information was most influential when encountered from another co-witness (both directly and indirectly). Participants were more likely to incorporate the misinformation into their statements when it was encountered through a co-witness discussion or through indirect information about a previous witness's statement, in comparison to the other sources of misinformation. Findings also suggested that co-witness information which was encountered indirectly was as influential as co-witness information encountered directly through post-event discussion. However, other research has produced evidence suggesting co-witness information encountered through a discussion is significantly more influential than co-witness information encountered indirectly (Gabbert et al., 2004). It must be noted that whilst the nature of the post-event information in Paterson and Kemp's (2006b) experiments were not analysed or controlled for, it appears that three out of the four pieces of misinformation were peripheral details (such as *The woman in the store was wearing a large brooch*) and not information central to the event; thus, further research would be required to determine whether similar observations would exist if the misinformation provided was more central and significant to the criminal event (see 2.3.1. for discussion about central and peripheral information).

Contrary to Paterson and Kemp's findings, other research has suggested that post-event information from interviewers can be as influential as co-witness information on memory recall, if presented through direct social interaction (Jack et al., 2013). It can be argued that in the Paterson and Kemp (2006b) study, co-witness information was only found to be the most influential source because the other sources of misinformation were presented indirectly through non-social methods (i.e. the misleading questions were presented in the form of a questionnaire). Jack et al. (2013) recreated a similar experiment, but unlike Paterson and Kemp (2006b), who used written questionnaires to present the participants with misleading questions, Jack et al. (2013) used an interviewer to directly present the misleading questions. The increased level of social interaction resulted in a similar level of misinformation acceptance between participants who were exposed to co-witness misinformation and those who were exposed to misleading questions from an interviewer. Regardless of the observations made by Jack et al. (2013), co-witnesses are still more likely to cause misinformation acceptance during real incidents due to the likelihood of encountering misinformation from co-witnesses being significantly more prevalent than the likelihood of encountering misinformation from a misleading police officer. This is because it is common practice for police officers to avoid using leading

questions when interviewing witnesses (Adler, 2013; Ainsworth, 2012; Howitt, 2015). More specifically, the implementation of the PEACE (Planning and preparation, Engage and explain, Account, Closure, and Evaluation) interview framework by UK police officers allows investigators to reduce the risks of exposing eyewitnesses with post-event information during an interview (ACPO, 2001; Dando, Wilcock, & Milne, 2009). In contrast, reports suggest that the vast majority of eyewitnesses are likely to be exposed to post-event information from co-witnesses, of which many may be false (Paterson & Kemp, 2006a; Skagerberg & Wright, 2008a).

2.3. Causes of misinformation acceptance

It is generally accepted that the misinformation effect can operate outside of a witness's awareness (Morgan, Southwick, Steffian, Hazelett, & Loftus, 2013), such that when an individual reports misinformation that was encountered post-event, they will genuinely believe that they had witnessed the misinformation (Loftus & Palmer, 1974; Scoboria, Mazzoni, & Kirsch, 2006). This unintentional acceptance of misinformation can be a result of memory distortions affecting the witness's reconstructions of the event (Cann & Katz, 2005; Schacter, Guerin, & Jacques, 2011; Tousignant, Hall, & Loftus, 1986).

However, McClosky and Zaragoza (1985) suggested that some eyewitnesses may also intentionally choose to recall the misinformation because of response biases and task demands. Eyewitnesses could be motivated to produce the correct answer and, in wanting to do so, they may purposely choose to recall misinformation that they did not witness personally if they perceive the source as being reliable (Gabbert et al., 2003; Gabbert et al., 2004). Both underlying processes behind misinformation acceptance are explained in more detail below.

2.3.1. Demand characteristics

Many eyewitnesses may intentionally choose to conform to their co-witnesses through informational social influence (Blank, 2009; Wright et al., 2009), the process of conforming to others to obtain the correct answer (Wright, London, & Waechter, 2009). This is because eyewitnesses will be aware of the implications that their statements will have on an investigation (Williamson, Weber, & Robertson, 2013). As a result, most witnesses will often try to be as cooperative as possible, by providing any information about the event

that they think might be beneficial for the investigation. However, their increased concern for providing police officers with accurate information can cause them to provide information that may have been learnt post-event. Williamson et al. (2013) asserted that when an eyewitness is motivated to provide an accurate report, they may be persuaded to report newly learned misinformation, if they perceive its source as being reliable.

The likelihood of a witness purposely including post-event information into their personal statement is moderated by the quality of their memory about the event (Gabbert, Memon, & Wright, 2007). An eyewitness would be more susceptible to accepting misinformation if their recollection of the event is limited or distorted (Walther, Bless, Strack, Rackstraw, & Wagner, 2002). Unfortunately for investigators, the memory report of eyewitnesses can often be heavily distorted (Deffenbacher, Bornstein, Penrod, & McGorty, 2004). This is because, when witnessing an incident, individuals will only encode a small proportion of the information that is present within their visual field at the time (Eysenck, 2012). Simons and Chabris (1999) demonstrated this within their observations on selective attention. Participants were asked to view a video of a group of children passing a ball around. At the same time, the footage also showed a man in a gorilla suit walking across the screen. However, when questioning the participants, the researchers found that many participants did not recall seeing the gorilla in the video. This was because when the participants' attention was fixated on the ball, their minds had failed to encode other details that were present (i.e. the man in the gorilla suit). During a criminal incident, similar issues with memory encoding can cause witnesses to miss out important details about the event (Kramer, Buckhout, Eugenio, 1990). In addition, the emotional distress exhibited by some witnesses could inhibit their cognitive abilities further, which would consequently result in an even smaller proportion of the information being encoded (Deffenbacher et al., 2004). Such effects of emotional distress and attention fixation can be used to explain the *weapon focus* effect, an inhibitory effect where eyewitnesses from crimes involving weapons (usually a firearm) tend to produce less accurate recollections of the event due to fixating their attention on the weapon (Stebly, 1992). As a result of poor memory encoding, many witnesses will encode less information and will be more likely to become reliant on post-event information to fill in the gaps within their memory, so that they can produce an accurate report for the investigator.

When individuals are asked to provide a statement about an incident, they will recall and report information that is both peripheral and central to the event (Dalton & Daneman, 2006; Daneman, Thannikkotu & Chen, 2013; Mahe, Corson, Verrier & Payoux, 2015). Central details about an event refer to critical information that play a major role in explaining how an event unfolded (Mahe et al., 2015). Such information is considered

indispensable to the course of the given incident (Candel, Merckelbach, Jelicic, Limpens, & Widdershoven, 2004). An example of central information to a criminal incident – as used in previous experimental paradigms – can be details about how a thief gained access to someone's property (see Heath & Erickson, 1998). On the other hand, peripheral details about an event refer to information relating to the characteristics of items and individuals that were present during the event – which in turn, are less relevant to explaining how the event unfolded (Christianson, 1992; Mahe et al., 2015). Referring back to the experimental paradigm of Heath and Erickson (1998), examples of peripheral information to a criminal incident include the brand of a soft drink can that was present during a robbery but not directly related the event. Both information that is peripheral and central to a criminal incident can be valuable to a criminal investigation. Central information that is reported can assist investigators in determining how a crime was carried out, which in turn could also help attribute blame to the correct suspect (Dalton & Daneman, 2006; Heath & Erickson, 1998). Peripheral details about an event can also be beneficial by allowing investigators to obtain identifiable characteristics of individuals associated with the incident (Wells & Leippe, 1981).

In relation to co-witness influence, there have been conflicting findings when comparing eyewitness suggestibility to central and peripheral misinformation. Some research has produced evidence suggesting that individuals are more susceptible to accepting misinformation that is peripheral in comparison to misinformation that is central to the event (see Dalton & Daneman, 2006). Researchers have attributed this to eyewitnesses being more attentive to the central details during an event and later being more confident in their own recollections of the such details in comparison to peripheral details (Luna & Migueles, 2009; Migueles & Garcia-Bajos, 1999). However, Mahe et al. (2015) produced results that suggested misinformation acceptance was only present when the misleading information was central to the event. An explanation for this discrepancy could be that in Mahe et al. (2015), the misinformation was presented by the interviewer as misleading questions whereas Dalton and Daneman (2006) presented the misinformation through confederates. Therefore, participants may have been more willing to accept the misleading central information from the investigator than from a confederate, due to the misinformation source being perceived as being more credible.

2.3.2. Source monitoring errors

However, not all eyewitnesses who include post-event information within their statements do it intentionally. Research indicates that many individuals will continue to include misleading post-event information in their statements, despite receiving instructions from investigators to not do so (Greene, Flynn, & Loftus, 1982; Jacoby & Kelley, 1992; Morgan et al., 2013). Jacoby and Kelley (1992) demonstrated this behaviour through a modified misinformation paradigm. Participants witnessed an event and were later presented with a misleading narrative about the incident. Later, when being interviewed by the investigator, participants were informed that the narrative provided to them earlier was incorrect and were encouraged to only recall details that they remembered seeing from the footage. Despite these precautions, many participants still reported the misinformation that they had learned from the narrative. Findings suggested that exposure to misleading post-event information could cause some eyewitnesses to genuinely believe that they had witnessed the misinformation.

To understand how false information can be embedded within a person's memory, the limitations of human memory, or — more precisely — the processes behind memory recall need to be considered. An individual's memory about an event does not exist in isolation, but rather in a world of other memories that can interfere with one another (Schacter, 2000). Memory retrieval is a reconstructive process rather than a retrieval process (Hasher & Griffin, 1978). That is, an individual will attempt to reconstruct the past by weaving together fragments of stored memories, with the aid of present knowledge about the event (Bartlett, 1933). Therefore, an eyewitness who is asked to produce a statement will first have to piece together as much information as they can from their memories to determine how the event unfolded. It is during this reconstructive process that eyewitnesses are at risk of unintentionally misattributing misinformation as witnessed information.

To avoid making such errors, the witness must be able to differentiate between the information that was witnessed during the event and additional information learnt after the event has occurred. To do this, the witness would have to evaluate each memory to determine its source, a decision-making process referred to as source monitoring (Johnson, Hashtroudi, & Lindsay, 1993). Source monitoring distinguishes different memories from one another to determine the sources from which the memories come from. When the attributes of memory representations differ significantly, fewer errors are made during source monitoring. However, if the memory representations share greater similarities, it can become more difficult to correctly attribute each memory to its correct source (Landau &

Marsh, 1997). The discrepancy detection principle (Tousignant et al., 1986) states that misinformation is more likely to be integrated within an individual's memory if it is not immediately rejected as being a false memory. Thus, the more plausible and similar the misinformation is to the individual's existing memory of the event, the more likely it is to be misattributed as witnessed information. Source monitoring judgements will predominantly focus on the quality of the memory fragment (Gabbert, 2004). The quality of memory representations can differ in relation to many different details of the event. These include the level of sensory detail, such as the colours and sounds that an individual will remember during the witnessed event (Porter & Birt, 2001); the contextual detail, remembering the time and location of witnessing the event (Friedman, 1993); the affective detail, remembering the emotional state the individual was in during the event (Buchanan & Lovallo, 2001); and the cognitive processes present during the event (i.e. what the individual was thinking at the time) (Johnson et al., 1993; Yonelinas, 2002). Memories of witnessed events will often be far more vivid and detailed than memories of imagined events that are based on post-event information (Lampinen, Meier, Arnal, & Leding, 2005; Wright & Stroud, 1998). It is therefore possible for an individual to differentiate between witnessed and imagined events based on the quality and detail of the memories (Johnson, Raye, Foley, & Kim, 1982).

However, in some cases, the witness may claim to have a very detailed and vivid memory about witnessing the misinformation. Loftus, Feldman, and Dashiell (1995) demonstrated how easily individuals could produce detailed memories about false events. With the aid of the participants' relatives, the researchers informed each participant about an imaginary event that had supposedly taken place during their childhood. Typically, participants were told that they had lost their parent in a supermarket and had been crying throughout the market for a considerable amount of time before being found. Most participants (75%) correctly stated that they could not remember the event; however, the remaining 25% had erroneously claimed to have remembered the false event. Many of these individuals went further and claimed to have remembered vivid details of the event, which had not been suggested to them. To explain this phenomenon, researchers have proposed that individuals can sometimes produce vivid memories about an imagined event by borrowing details from a similar legitimate memory to corroborate the false memory (Dewhurst, 2001; Lampinen, Faries, Neuschatz, & Toglia, 2000; Odegard & Lampinen, 2004), a psychological process referred to as *content borrowing* (Lampinen, Meier, Arnal, & Leding, 2005). Relating content borrowing back to eyewitness suggestibility, the theory suggests that eyewitnesses who are exposed to misinformation may become more convinced about witnessing the false details if the false memory is corroborated by real memories from the event.

2.3.2.1. Fate of the original memory

Eyewitnesses are more likely to incorporate misinformation during memory recall, if there are no existing memories that would contradict it. This is because it is easier to create a new memory from the misinformation than it would be to alter an existing one (Gabbert et al., 2006; Wright, Mathews, & Skagerberg, 2005). This process of creating 'new' memories from misinformation is more common when the memory is regarding the peripheral details of an event due to eyewitnesses being less likely to remember peripheral information from an even in comparison to central information. This was evidenced in Dalton and Daneman (2006) who found that participants were significantly less likely to remember peripheral details of an event than the central details. Consequently, the participants were also found to be more susceptible to accepting peripheral misinformation that they were unaware of than misinformation that was central to the event. However, even if there is an existing memory that would contradict with the misinformation, source monitoring errors can still cause the witness to internalise the misinformation into their memory. A fundamental question arising from this process is one of the fate of the original memory.

The fate of a witness's original memory after the misattribution of misinformation has been the subject of repeated debate amongst researchers. Loftus and Loftus (1980) originally suggested misinformation could alter the original memory trace and resultantly erase any recollection the individual may have of certain details from the original event. Other researchers argued that rather than erasing the original memory completely, misinformation would merely make the original memory harder to retrieve (Belli, Windschitl, McCarthy, & Winfrey, 1992; Chandler, 1991). The retrieval-strategy disruption (RSD) hypothesis suggests that exposure to conflicting information during memory recall can disrupt the memory retrieval process and consequently result in poorer memory recall (Basden & Basden, 1995; Basden, Basden, Bryner, & Thomas, 1997; Dahlström, Danielsson, Emilsson, & Andersson, 2010). Thus, eyewitnesses who encounter misinformation when trying to remember the original event will be less likely to retrieve the original memory and will consequently become more vulnerable to accepting the newly encountered misinformation.

However, the notion of memory alteration has been largely contested by many researchers who argue that misinformation cannot cause any form of impairment to an eyewitness's original memory (McCloskey and Zaragoza 1985; Zaragoza, Dahlgren, &

Muench, 1992; Zaragoza, McCloskey, & Jamis, 1987). These researchers argue that misinformation has no effect on pre-existing memory. Instead, it has been suggested that misinformation simply influences the recollections of witnesses who are not able to accurately encode the original event or are unable to recall it. With the absence of any memories to contradict the misinformation, the witnesses are susceptible to attributing the misinformation as witnessed information (Zaragoza & Lane, 1994). Alternatively, researchers suggest that some eyewitnesses may remember both sources of information but, after deliberation, may choose to accept the misleading source if they decide that it is correct (Loftus, Feldman, & Dashiell, 1995).

McCloskey and Zaragoza (1985) supported this argument through a modified misinformation paradigm that tested participants' abilities in memory recognition. Within the typical misinformation paradigm, participants would view a crime where a salient item is seen during the incident, such as a screwdriver. After witnessing the crime, some participants would be exposed to misinformation which would suggest that a different item was present instead, such as a hammer. Later, during the eyewitness interview, the participants would be asked to determine whether they saw a screwdriver or a hammer. Most participants exposed to the misinformation would erroneously believe they had seen a hammer, whereas participants who were not presented with any misinformation (control) would correctly identify the screwdriver as having been present during the event. Within McCloskey and Zaragoza's (1985) 'modified test', the misinformation option would be excluded as a possible response. Instead, the participant would be asked to choose between the correct item (screwdriver) and a new unrelated item (i.e. a pencil). If the misinformation would have truly impaired the participant's original memory of the event, the participants should have not been able to correctly recall seeing a screwdriver. However, the study found that participants who were exposed to the misinformation could still correctly identify the original item, suggesting that the misinformation had not impaired their original memory. Whilst the study of McCloskey and Zaragoza (1985) observed the effects of misinformation on memory recognition rather than memory recall – and thus not representative of the task of giving a witness statement – the findings can still be used to suggest that a witnesses' original memories for events cannot be altered or impaired by post-event information.

The true process of memory impairment during the misinformation effect remains a topic of debate. However, rather than assuming that one theory triumphs over the others, it can be accepted that eyewitnesses can incorporate misinformation into their personal memories differently (Loftus, 2005). Some witnesses may incorporate misinformation into their memories due to not having an existing memory for the event; some may incorporate

the misinformation into their memories after deliberation between the different sources of information; and some witnesses may incorporate misinformation into their memories from having their original memories of the event impaired by misinformation. Regardless of the way in which misinformation is internalized, all the theories come to an agreement on a more pressing issue: that eyewitnesses are vulnerable to incorporating misinformation into their personal memories of an event.

2.3.3. Comparing the causes of misinformation acceptance.

When considering the different causes for misinformation acceptance during memory recall, a subsequent question to consider is which contributing cause predominates? Determining the exact cause for misinformation acceptance between different individuals can bear difficulties. Participants would have to first comprehend that their memory report was confabulated and this can be an issue if the participant has incorporated the misinformation into their memory through source misattribution. Participants who incorporate the misinformation purposely as a result of demand characteristics may be reluctant to admit that this is due to the negative connotations of being perceived as a suggestible individual. Of course, one of the most straightforward ways of determining the most prevalent cause of misinformation acceptance is to simply question the participants about what influenced their responses. Loftus, Feldman, and Dashiell (1995) attempted to identify the most common cause for misinformation acceptance in such a manner. Participants ($N=301$) were shown slides about an event and afterwards, half of the participants were given a misleading narrative about the event (misinformation). When being interviewed, 49% of the participants who had been exposed to the misinformation had subsequently included the misinformation in their memory recall statements. Participants who had reported the misinformation in their statements were asked to provide a reason for their answer. The results indicated that 34% of these participants had simply guessed. A further 30% chose to include the misinformation because they had read about it and believed it was likely to be correct, suggesting that they were influenced as a result of task demand. An additional 27% of the participants who included the misinformation in their statements genuinely believed that they had witnessed the misinformation, suggesting that they were influenced as a result of source monitoring errors. Furthermore, 7% of the participants remembered the details from both the original event and the narrative, however, after, were convinced that they witnessed the misinformation. An additional 2% had included the misinformation because it sounded familiar. Overall, the study indicated that individuals can incorporate misinformation into their original reports for varying

reasons, which could suggest that the cause of misinformation acceptance may be related to individual differences. Therefore, an additional question that arises is whether the cause of misinformation acceptance can vary depending on the type of misinformation encountered. It must be acknowledged that Loftus et al. (1995) investigated the causes of misinformation acceptance to misleading questions, whereas the present studies focussed on the misinformation acceptance to co-witnesses instead. Thus, the above findings cannot be reliably used to predict the predominant causes of co-witness misinformation acceptance. The subsequent chapter investigates the causes of co-witness influence in more detail.

Chapter 3: Co-witness Influence

3.1. Co-witness discussions

As discussed in the previous chapter, co-witnesses have been identified as one of the most influential and frequent sources of misinformation (Jack et al., 2013; Paterson & Kemp, 2006b). Additionally, Gabbert et al. (2004) argued that co-witness influence was most influential when presented directly through a post-event discussion. Therefore, it is worth assessing the effects of co-witness discussions on eyewitness evidence in more depth.

It is very common for eyewitnesses to discuss the incident with the people around them straight after witnessing a crime (Skagerberg & Wright, 2008a). The recurrent tendency for an eyewitness to engage in post-event discussion with others is motivated by their need to make sense of the event (Paterson & Kemp, 2006a). After witnessing a crime, many witnesses will be left in a state of confusion and uncertainty regarding the incident, due to induced emotional distress and consequent improper memory coding (Christianson, 1992; Deffenbacher, Bornstein, Penrod, & McGorty, 2004; Payne et al., 2007). When faced with uncertainty, many witnesses will often choose to engage in a discussion with co-witnesses as a way of validating their own recollection (Blank, 2009; Williamson et al., 2013). Police officers are aware of the consequences that can arise from allowing eyewitnesses to discuss the event with each other before giving evidence (Paterson & Kemp, 2006a). However, despite their best efforts to intervene, discussions among eyewitnesses can be extremely difficult, if not impossible, to prevent (Yarmey, 1993).

In an attempt to gain more accurate figures about co-witness discussions amongst real eyewitnesses, Paterson and Kemp (2006a) used a series of questionnaires to screen for previous eyewitnesses of serious events. Whilst the study was unable to determine the impact co-witness discussions had on the accuracy of eyewitness statements, it was able to highlight the likelihood of eyewitnesses encountering post-event information. A total of 773 undergraduate students (M age=20.1) from the UK were initially approached for screening. Those who reported having witnessed a serious crime (homicide, attempted murder, manslaughter, physical assault, sexual assault, event/accident causing serious injury/death, abduction, property vandalism, breaking and entering, motor vehicle theft, fraud, blackmail, extortion, arson, or robbery) in the presence of other co-witnesses were contacted to complete a follow-up questionnaire to determine whether they discussed the event and the nature of their interactions. Initially, 75% of the participants reported having witnessed at least one serious event in the past, of which 30% were victims and 70% were witnesses.

With regards to the type of crimes witnessed; the most commonly witnessed crime was physical assault (30%), followed by an incident that resulted in serious injury/death (27%) and robbery (18%). In total, 86% of previous eyewitnesses reported having witnessed the event with at least one other co-witness present; the survey suggested that on average, there were 6.77 co-witnesses present during a crime. Of these individuals, 86% admitted to discussing the event with a co-witness after witnessing the event. Cumulatively, the figures reported by Paterson and Kemp (2006a) suggest that co-witness discussions are a common occurrence after a serious criminal incident.

The survey also found that the time interval between witnessing the event and discussing it with others varied from immediate discussion to 6 months (Paterson & Kemp, 2006a). However, the majority (67%) of the respondents reported discussing the event with other co-witnesses immediately after witnessing the incident and an additional 22% reported discussing the event later the same day. When investigating the different motivations for discussing the event with co-witnesses, the survey indicated that the majority of respondents (44%) had chosen to discuss the event with others in an attempt to provide information to others. An additional 41% chose to engage in a co-witness discussion for emotional support. This finding was fitting, as the survey had also found that the majority of eyewitnesses had exhibited some level of fear during the incident. When asked to give a rating on their level of fear during the incident, eyewitnesses reported an average score of 3.4 (out of six). Some of the less frequent causes for co-witness discussion that were reported included storytelling (21%) and advice seeking (18%). Although the survey from Paterson and Kemp (2006a) was based on a student-only sample, it offers a highly descriptive report on the prevalence of post-event discussions within real criminal investigations. Furthermore, Skagerberg and Wright (2008a) conducted a similar study on real eyewitnesses, using a more diverse sample. The study produced similar results to Paterson and Kemp (2006a), suggesting that their findings were generalisable, despite coming from a student-only population. A limitation of the surveys was that the researchers did not ask the participants whether they provided an official court testimony, making it difficult to determine whether participants who are willing to provide official testimonies are as likely to have engaged in co-witness discussions.

Practitioners within the criminal justice system are well aware of witnesses' tendencies to engage in post-event discussions. Consequently, lawyers will usually question the witnesses to determine whether they have discussed the event with other co-witnesses (Yarmey & Morris, 1998). Additionally, it is common practise for judges to prohibit witnesses from hearing the testimonies of other witnesses and to instruct each individual witness not to discuss the event with others during a trial (Yarmey & Morris, 1998). In

relation to policing practices, the UK guidelines on identification parades explicitly state that when multiple eyewitnesses are present investigators should make the effort to ensure that the witnesses are separated during the investigation (Home Office, 2003). Similar practices of separating eyewitnesses during interviews have also been integrated by police forces in Australia (Field Operations, 1997) and the United States (NIJ, 1999). Such interventions were notably enforced within the United States during the 2002 D.C sniper attacks in Washington, where police officers were instructing eyewitnesses from the crime scenes not to discuss the event with each other to prevent co-witness contamination (Morello & Davis, 2002). However, when questioning previous witnesses within the UK about their experience with how the police handled criminal incidents, Paterson and Kemp (2006a) found that the responses given contradicted the practices that have been set out by the policing framework within the UK. Although the Home Office (2003) states that the UK guidelines instruct officers to keep witnesses separated, only 14% of the previous eyewitnesses in Paterson and Kemp's (2006a) survey had been instructed by a police officer not to discuss the event with co-witnesses. Furthermore, 24% of the respondents reported that a police officer had actually encouraged them to discuss the event with their co-witnesses. The findings suggest that despite being encouraged to prevent co-witness discussions, many police officers will fail to implement this intervention during most incidents — however, it must be acknowledged that Paterson and Kemp did not exclude participants who may have witnessed a crime before 2013, meaning that some participants may discussed their experiences of giving a statement before the Home Office introduced mandates to keep witnesses separated.

Failure to prevent co-witness discussions can be attributed to different causes. As mentioned above, the majority (64%) of eyewitnesses who engage in co-witness discussions choose to discuss the event immediately after witnessing the incident (Paterson & Kemp, 2006a). Many police officers will not be able to arrive at the incident immediately, allowing these witnesses to engage in a discussion without being interrupted. Additionally, in another survey on police officers, Paterson and Kemp (2005) found that not all officers believed that co-witness discussions were detrimental to memory reports, which could suggest that some officers may intentionally choose not to disrupt a co-witness discussion. The survey also found that many police officers believed that co-witness discussions carried some advantages in improving statement quality; this would explain why almost a quarter of the previous eyewitnesses from the Paterson and Kemp (2006a) study had been encouraged by an officer to engage in a post-event discussion.

Problems from co-witness discussions can arise if the eyewitnesses hold contradicting views; the inability to settle on the details of an event between each other can

have enormous consequences for the investigation (French, Garry, & Mori, 2008). Longitudinal research has found that individuals who are present during the same event are likely to hold different recollections later on (French et al., 2006). This can be due to various different situational factors. In particular, eyewitnesses may have different recollections due to fixating on different cues during the event (Gabbert et al., 2006). Memory reports between eyewitnesses can also vary if the witnesses were situated at different vantage points (Gabbert et al., 2003). Other factors that can cause discrepancies between eyewitness recollections include the level of stress exhibited by the witness (Deffenbacher et al., 2004) and memory decay (Tuckey & Brewer, 2003). Problems can arise from co-witness discussions when some of the witnesses hold a false recollection of the event. In such circumstances, a post-event discussion can cause some witnesses to incorporate the false recollection of others into their own statements, this effect has been termed as *memory conformity* (Carlucci et al., 2010; Davis & Meade, 2013; Garry, French, Kinzett, & Mori, 2008; Paterson, Kemp, & McIntyre, 2012; Wright et al., 2005).

Previous cases of eyewitness errors have demonstrated that witnesses can be influenced by others when attempting to provide a statement and also when trying to make an identification. The previously discussed Oklahoma bombing incident (see chapter 2) provides a clear example of how co-witness discussions could lead to severe disruptions to an investigation through contaminating the memory recollection of a witness. In other cases, co-witness discussions have also contributed to misidentification of innocent suspects during an identification parade, as with the case of Barry George (see chapter 2). Although never fully convicted, Peter Hain was also wrongfully accused of a crime by multiple witnesses, due to co-witness influence. Hain, a former leader of the House of Commons, was falsely charged with bank robbery earlier on in his career. Despite being innocent, multiple witnesses had testified seeing him flee the crime scene. The witnesses were three teenagers (aged 12-13) who had decided to discuss the incident with each other prior to going to court. During discussion, all three witnesses had unanimously come to an agreement that Hain was the suspect that they had seen fleeing the scene (Hain, 1976). In reality, Hain was not involved with the incident in any way; however, it was later revealed by the witnesses that the erroneous report of one of the witnesses had influenced the reports of the others during the group discussion.

3.2. A theoretical model of co-witness influence

The previous chapter discussed how misinformation could be incorporated into one's memory through both intentional and unintentional processes. With regards to misinformation that is specifically encountered through co-witness discussions, researchers have suggested that memory conformity would be predominately facilitated by different forms of social influence such as informational influence (Blank, 2009; Wright et al., 2009), a heightened need for being correct can persuade an eyewitness to report newly learnt misinformation, if they perceive the source to be accurate (French et al., 2011; Williamson et al., 2013); and normative influence, the pressure to conform as a means for social approval (Wright et al., 2009). However, in relation to eyewitness evidence, if police investigators are trained to collect statements privately, a witness's statement would bear less social repercussions and thus, the level of normative influence would be significantly reduced. However, one could argue that a witness would still exhibit some level of normative pressure from the investigator and thus, normative influence would not be completely eradicated during an eyewitness interview. Based on research suggesting that co-witness influence will be predominantly caused by informational influence (Thorley, 2015), the fundamental theoretical frameworks relating social influence are explored below.

3.2.1. History of social conformity research

Social conformity is the act of an individual changing their behaviour in order to match that of other individuals around them (Cialdini & Goldstein, 2004). The act of social conformity can influence an individual's behaviour in a vast array of contexts, from simple personal views such as musical preferences (Berns, Capra, Morre, & Noussair, 2010) to more serious implications such as giving a verdict as a jury member (Walters & Hans, 2009). The behavioural act of social conformity has been well investigated since 1936 (see Sheriff, 1936). Perhaps the most notable paradigm used to observe the effects of social conformity is Solomon E. Asch's line-judgment experiments (e.g. Asch, 1951, 1952, 1956). Asch's paradigm (see Asch, 1952) placed participants in groups, where all but one of the participants were confederates (actors). The participants carried out a perceptual task where they were shown an image of a line and then presented with three differently-sized lines and asked to identify which one of the three lines was the same size as the original. The experiment was manipulated so that the confederates always answered incorrectly and the true participant was always the last to answer. The task difficulty was deliberately made

easy, with only one percent of the control group failing it. This way, any significant increases in false responses could be confidently attributed to another external factor (group pressure). The study found that on average there was a conformity rate of 33%, with 75% of the participants conforming in at least one of their twelve trials.

Through manipulation of the majority size between experiments, the data indicated that the addition of the third confederate had the greatest impact on conformity rates. The data also illustrated that after the addition of the third confederate, the effect of any additional confederates on conformity rates was minimal. Based on these findings, Asch theorised that after the addition of the third group member, additional group members would not increase an individual's probability of conforming any further. He stated that this was because after the addition of the third individual, the respondent would view the group as one collective source of information and therefore, additional group members would not be seen as different sources of information. Although being relatively dated studies, more recent research has reproduced the experimental paradigm and continued to find similar findings (see Chen, Wu, Tong, Guan, & Zhou, 2012; Mori & Arai, 2010). However, early research on social influence was primarily based on simplistic tasks (i.e. line judgement), where the task difficulty was very low and the level of informational influence would have consequently been lower (Festinger, 1954). When considering the process of producing an accurate eyewitness statement, the task at hand is arguably more difficult and ambiguous than the simplistic judgement tasks incorporated by the majority of early conformity studies (e.g. line judgement). Thus, the theoretical models of social influence that were derived from simple geometric tasks must be interpreted cautiously when attempting to explain informational influence amongst co-witnesses.

3.2.2. Normative VS informational influence.

3.2.2.1. Normative influence.

Researchers have identified that there are multiple influential causes for conformity, normative and informational influences (Deutsch and Gerard; 1955; Kaplan & Miller, 1987; Toelch & Dolan, 2015). Normative influence refers to the pressures that an individual may face to conform to another person or group in order to gain social approval and acceptance from them (Hagger & Chatzisarantis, 2005). The need for social approval and the fear of rejection is a consistent attitude held across all cultures (Forgas & Von Hippel, 2005; Leary & Baumeister, 2000). Normative influence is more effective when acceptance by the group is deemed to be rewarding by the individual and thus, the individual is motivated to conform

to them in order to gain their acceptance, build relationships with the individuals, and reap the perceived rewards. These rewards can range from higher social status to actual material gain from the group. Cialdini and Goldstein (2004) also found that gaining social approval can enhance an individual's self-esteem, which can act as further motivation for wanting to conform.

As well as gaining social acceptance, normative influence also relates to the fear of rejection and ridicule by the majority, which in turn can be just as influential in facilitating conformity. Hagger and Chatzisarantis (2005) found that fears of social rejection and exclusion from a social group were influential on an individual's decision to conform to others. This was evident in Asch (1952). After participants had taken part in the line-judgement task, Asch interviewed the participants and found that despite conformity being mainly due to informational influence (the need to obtain the correct information), many participants stated that they did not believe the answers they conformed to, but said it in order to prevent themselves from standing out. Research has even shown that fear of social punishment can be more effective than the reward of social acceptance for social conformity (Lewis et al., 2008; Stewart, Morris, Mellings, & Komar, 2006; Zipf, 1960). Further evidence highlighting the presence of normative influence was produced by Deutsch and Gerard (1955). Within their study, participants carried out tasks similar to Asch's line perception task; however, the experiment was manipulated so that some participants gave their answers anonymously, whilst others gave their responses in front of other group members. The study found that conformity rates were significantly reduced when the participants could give their answers anonymously and avoid being socially rejected by others. When interviewing the participants who had to give their answers in front of other group members, seven out of fourteen participants claimed that they felt obligated to conform to the others within their group, whereas the participants from the anonymous conditions did not mention feeling any obligations to agree with others. Although Asch's line judgement experiments were based on a simplistic line matching task and not a memory recall or blame attribution task, the findings could suggest that eyewitnesses could be susceptible to conforming to the recollections of their co-witnesses in order to prevent negative evaluation— however, more direct evidence is needed to support this assertion.

Similar effects of normative influence have been observed on individuals when faced with tasks that relate more to giving an eyewitness statement — such memory recall tests. In relation to the normative pressures affecting an individual's memory recall, Wright et al. (2009) found that during a series of collaborative memory recall trials, many participants had chosen to conform to their partners' erroneous reports to avoid receiving any negative

evaluation from them. As explained previously however, if police investigators are trained to collect statements privately, such normative pressures for conforming would be reduced.

3.2.2.2. Informational influence

Informational influence is a process where an individual obtains information from a group and accepts it as accurate information about reality (Kaplan & Miller, 1987; Lord, Lee, & Choong, 2001). Informational influence is at its strongest when an individual is uncertain about the task or topic at hand. The uncertainty causes the individual to rely on external sources for the correct information (Suls & Wheeler, 2000). Researchers have argued that when an individual cannot make an accurate judgement objectively, they become reliant on socially encountered information to assess the accuracy of their own judgement (Festinger, 1954; Shainyak, 2013). For informational influence to be effective, the target must believe that the information source is more likely to be correct than them (French et al., 2011; Williamson et al., 2013). The social information will be more likely to be perceived as being reliable when it is unanimously presented by all of the group members. This is because individuals are less likely to perceive information that is held consistently by multiple individuals as being incorrect — a process referred to as the frequency-validity principle (Fiedler, 2000; Hertwig, Gigerenzer, & Hoffrage, 1997). Ciadini and Trost (1998) also state that society has been led to believe that the majority consensus represents the social norm, therefore individuals are more likely to believe that a certain belief that is held by the majority of a group is likely to be correct. Post-experimental interviews with participants that had exhibited social conformity have found that many participants choose to adopt the same views as the majority because they assume it is the correct view, due to being held by the majority of the group (Asch, 1952; Fiedler, 2000; Sherif, 1961). With regard to co-witness influence on both memory recall and identification, multiple eyewitness studies have shown that eyewitnesses will only accept misinformation from co-witnesses that they deem as having accurate memory and eyesight abilities (identification: Skagerberg & Wright; 2009. Eyewitness recall: Stanny & Johnson, 2000; Thorley, 2015; Williamson et al., 2013) — providing evidence to suggest that co-witness influence is caused by informational influence. Resultantly, the subsequent chapters within the thesis primarily draw on the theoretical model of informational influence when investigating the predictors of co-witness influence.

3.3. Measuring co-witness influence in a laboratory setting

Previous research has incorporated different experimental procedures that can be used to observe the effects of co-witness discussions on memory reports, most of which have been based on the procedural framework of the *misinformation effect paradigm* (see Chapter 2). Despite the fact that many of these paradigms have not been used to directly observe the behaviour of crime eyewitnesses, they allow researchers to observe the effects of group discussions on memory recall — the integral foundation of co-witness influence. Most notably, the following three paradigms have been used to observe the potential effects of group discussions: *The social contagion of memory*, *memory conformity*, and *collaborative recall* (Harris, Paterson, & Kemp, 2008). It must be noted that the names used to refer to the following paradigms were incorporated from early research studies which notably incorporated the respective experimental designs.

3.3.1. Collaborative recall paradigm

Although not directly linked to misinformation acceptance, the collaborative recall paradigm has allowed researchers to observe the effects of group discussion on memory recall (See Basden et al., 1997; Basden, Basden, Thomas, & Souphasith, 1998; Thorley & Dewhurst, 2007). Typically, groups of participants would be given a list of items to remember (such as words or images). After completing a filler task (an unrelated task used to divert the participants' attention for a brief amount of time), participants would be instructed to work as a group and verbally recall as many items as they could remember. Following the initial recall test, participants would then be individually tested and asked to write down as many items as they could remember. The interviewer would instruct participants not to guess, and to only write down the items that they confidently remembered witnessing. Studies using the collaborative recall paradigm have typically found that individuals who engage in a collaborative discussion with others are at a higher risk of making memory recall errors when questioned individually later on (Basden et al., 1998; Meade & Roediger, 2009; Thorley & Dewhurst, 2007). Although the collaborative recall paradigm can allow researchers to observe the effects of group discussion on general memory recall, the design does not accurately simulate a co-witness discussion, mainly due to the fact that participants are asked to memorise a series of words or items rather than an event. The recollection of a series of words requires the individual to retrieve items from their short-term memory and recall it (Seidlitz & Diener, 1998), whereas the recollection of

an event would require an individual to not only recall information from their short-term memory, but to also use cognitive reasoning skills to order and interpret the event correctly (Devine, 2012; Devine, Clayton, Dunford, Seying, & Pryce, 2001), thus a more realistic paradigm is required to observe the effects of co-witness influence on eyewitness testimonies.

3.3.2. Social contagion of memory paradigm

The social contagion of memory paradigm (Roediger, Meade, & Bergman, 2001) is an experimental procedure that uses confederates to deliberately expose participants to misinformation. The paradigm was used by Roediger and colleagues to study how false memories could be implanted through social influence. Employing an interactive procedure originally conceived by Schneider and Watkins (1996), the paradigm consists of four main stages: a study phase, filler task, collaborative recall (discussion) and a final individual recall task. In the study phase, the participants were paired with a confederate and shown six different slides depicting household scenes (i.e. a bathroom or a kitchen) for a set amount of time. Each slide contained an average of 23.8 objects that were a mixture of high and low expectancy items (items that would/would not be expected to be present in certain scenes). Participants were instructed to pay attention to the objects in each slide. After witnessing all six slides, the participant and confederate were given individual filler tasks consisting of mathematical problems on a piece of paper. The participants were allocated four minutes to complete as many questions as they could. The collaborative recall phase was then used to replicate a co-witness discussion. The task required the participant and confederate to take turns in recalling an object that was present during each slide, until they had each recalled 6 objects (12 collaboratively) from each slide. The confederate had received previous instructions to recall some objects that were not present in the slides (misinformation). More specifically, the confederates had been instructed to falsely recall one high-expectancy object (e.g. a toothbrush in the bathroom) and one low-expectancy object (e.g. screwdriver in the bathroom) for each slide. Finally, the individual recall task was used to replicate an eyewitness statement. The participant was asked to list all of the items that they remembered seeing from each slide on multiple sheets of paper (a separate sheet was used for each slide).

Roediger et al. (2001) found that participants were more likely to report seeing erroneous objects within the slides if they had been suggested to them by the confederate during the collaborative recall. The paradigm has been adopted in numerous additional

research studies on co-witness influence. Concordantly, the majority of research using the social contagion of memory paradigm have produced similar observations to Roediger et al. (2001), identifying a relationship between exposure to misinformation from confederates and false eyewitness memory reports (see Allan & Gabbert, 2008; Gabbert et al., 2004; Ost, Ghonouie, Cook, & Vrij, 2008; Ost, Hogbin, & Granhag, 2006; Shaw, Garven, & Wood, 1997; Wright et al., 2005).

3.3.3. Memory conformity paradigm

The memory conformity paradigm allowed researchers to avoid the use of confederates by presenting the participants with different information about the same event. By presenting the pairs with different information, they would have been likely to hold differing recollections to each other. Subsequently when discussing the event, the participants would encounter some details about the event that they would not have been able to witness (see Gabbert, Memon, & Allan, 2003; Wright, Self, & Justice, 2000). This approach was utilised by Gabbert et al. (2003), who showed participant dyads slightly different videos of the same event. Both videos contained the exact same sequence of events, but were filmed from different angles, allowing the participants to witness items that would not have been present in their partner's footage. Shortly after viewing the footage, the participants engaged in a discussion with their partner about the event. They were instructed to collaboratively discuss their answers to a series of written questions about the event. The participants then completed a 45-minute filler task before engaging in the main recall test. Participants privately completed a questionnaire about the event which involved providing a free recall and answering eight specific questions. Using the memory conformity paradigm, Gabbert et al. (2003) demonstrated that participants who discussed the event with a co-witness were susceptible to reporting unwitnessed information from their partner in their individual statements.

When using the memory conformity paradigm, the experimenter must ensure that participants do not suspect viewing different footage from their co-witness, otherwise, participants may become aware of the study's purpose and change their behaviour accordingly. To avoid this, researchers have employed various methods to present participants with differing videos without arousing suspicion. The majority of research using this paradigm has simply used a screen to separate the participants when showing them different videos (see Gabbert et al., 2003; Hope, Ost, Gabbert, Healey, & Lenton, 2008; Skagerberg & Wright, 2008c). The researchers would usually provide the participants with a

misleading explanation for making the participants view the footage separately. For instance, Skagerberg and Wright (2008c) told their participants that two monitors had to be used to ensure that both participants viewed the footage from the same angle; similarly, Hope et al. (2008) told participants that there was only one monitor available and the researchers wanted to ensure that the participants viewed the event from the same distance. A limitation to this 'dual-screened' approach is that the participants would be separated from their co-witnesses when witnessing the event, reducing the ecological validity of the experiment. An alternative method for presenting participants with different videos without them noticing is the MORI (manipulation of rivalrous images by polarizing filters) technique (Mori, 2003; 2007). The procedure enables the experimenter to project two different videos on the same screen by utilizing light polarization. Two videos are polarized at different angles allowing the experimenter to block out either of the videos by using an appropriately adjusted polarizing filter. By allowing participants to view the projection through different polarization filters (worn as spectacles), the experimenter can present the participants with different videos at the same time and location. Owing to these benefits, the MORI technique has been widely adopted within research studies on memory conformity (French, Garry, & Mori, 2008; Hirokawa, Matsuno, Mori, & Ukita, 2006; Mori & Mori, 2008). An issue with the majority of paradigms used to observe co-witness influence was that all participants believed that they had seen the footage from the same view/angle. In reality, many participants would be aware that their co-witnesses may have witnessed the incident from a different vantage point and as this could have an impact on their willingness to accept their co-witnesses' information.

3.4. Empirical research findings

As discussed in chapter one, eyewitnesses can contribute to an investigation by providing an identification of the suspect (from a line-up), or by providing a statement about their recollection of the incident (Brewer & Wells, 2011; Bruer, Harvey, & Adams, 2017; Gronlund, Wixted, & Mickes, 2014; Lindholm, 2008). The two tasks are facilitated by different cognitive processes, with eyewitness recall primarily relying on working memory capacity and memory retrieval (Berger & Herringer, 1991); whereas eyewitness identification relies more on memory recognition pathways and facial recognition ability (Andersen, Carlson, Carlson, & Gronlund, 2014; Bindermann, Brown, Koyas, & Russ, 2012). However, despite these slight differences in underlying processes, research has indicated that eyewitnesses can be influenced by their co-witnesses during both tasks— a process that is more commonly known as *memory conformity* (Gabbert et al., 2003; Paterson et al.,

2012; Zajac & Henderson, 2009). As well as influencing what a witness remembers seeing (memory conformity), co-witness discussions can also have an influence on the confidence that a witness places in their statement and also how they interpret the event and subsequently attribute blame (blame conformity). The aforementioned effects of co-witness influence are discussed extensively below.

3.4.1. Memory conformity

Memory conformity is the most commonly observed effect of co-witness influence (Carlucci et al., 2010; Davis & Meade, 2013; Garry et al., 2008; Paterson et al., 2012; Wright et al., 2005). However, the exact nature of the types of information that witnesses can conform to falsely witnessing can vary. Research on memory conformity has most commonly found that witnesses can be influenced into erroneously recalling peripheral details that may have been present during the incident (i.e. the colour of the getaway car or the type of weapon used). Other research has found that certain items can also be falsely recalled or missed out completely due to memory conformity (Gabbert et al., 2003; Gabbert et al., 2004). For instance, Gabbert et al. (2004) found that many participants could be influenced by their co-witnesses into falsely reporting the wrong item of clothing on the offender and also reporting seeing a gun, when no weapon was used.

Memory conformity can also involve the false recollection of more salient and central details of an incident which could have a greater impact on the investigation, such as identifying the number of suspects that were present during a crime (as evident in the Oklahoma Bombing investigation). Wright et al. (2000, Experiment 2) created an experimental scenario to see whether individuals could be influenced by their co-witnesses into falsely reporting seeing additional accomplices to a crime. The memory conformity paradigm was used, participants ($N=40$) were paired up and presented with 21 images depicting a series of events where two men met each other and entered a snooker hall to play a game of snooker. Whilst playing snooker, the pictures depict a woman stealing one of the men's wallets. The researchers had slightly altered some of the images, so that half the pairs only saw the women committing the crime, whilst the other half saw the women committing the crime with multiple accomplices. After discussing the event with each other, the participants filled out a questionnaire about the incident (with one of the questions asking whether the suspect entered the building alone or with accomplices). The results indicated that participants were susceptible to conforming to their partners' reports. More specifically, 15 (79%) of the pairs came to an agreement on whether the suspect was alone

or accompanied by others, indicating that one of the participants will have conformed to the conflicting memory report of their partner. With regards to the direction of the conformity, seven of the conforming pairs agreed that there were accomplices present, and the other eight pairs decided that the suspect entered the building alone, suggesting that there was no general tendency for the memory conformity to be skewed in one direction. Instead, the results suggested that the direction of conformity was dependent on which partner was more confident in their judgement; the participant who was more confident in their judgement was more likely to influence their co-witness into accepting their memory report. Similar relationships between confidence and co-witness influence have been repeatedly reported by previous research (Goodwin et al., 2012; Schneider & Watkins, 1996). Schneider and Watkins (1996) reported that when a person displayed high levels of confidence, the other person would be more likely to be persuaded by them. Correspondingly, it is believed that after the Oklahoma bombing incident, Tom Kessinger was able to influence the other co-witnesses because of his confident recollection (Memon & Wright, 1999).

3.4.1.1. Memory conformity during line-up identification

Co-witness discussions can also influence a witness's decision during suspect identification, which can consequently contribute to causing a false conviction (Zajac & Henderson, 2009). Within many investigations where the police have identified a potential suspect, a photographic line-up (or an *identification parade* when live actors/suspects are used instead of photos) is used to determine whether an eyewitness can identify the correct suspect to the crime. Typically, a photo of the suspect is placed among the photos of multiple innocent people who are unrelated to the crime (*foils*). The witness is asked if they can identify the suspect from the line-up. Any identifications made by the witness can then be used as legal evidence to convict the suspect. Wright and McDaid (1996) estimated that in 83% of police line-ups, multiple witnesses are used. Therefore, it is likely that most witnesses who are asked to make an identification could have encountered co-witness information beforehand.

However, photographic line-ups can be unreliable due to most witnesses having a tendency to believe that the perpetrator is present within the line-up (Memon, Hope, & Gabbert, 2002). By holding this presumption, many witnesses will be motivated to make an identification, even if the target is not present within the line-up (Davies, 1996). In addition, many witnesses are at risk of falsely identifying an innocent bystander as being the

offender, through the process of *unconscious transference*. Unconscious transference refers to a processing error where an eyewitness can falsely identify an innocent bystander as the perpetrator because of a previous encounter with the bystander in another context. The misattributed sense of familiarity can consequently influence the witness to make a misidentification (Read, Tollestrup, Hammersley, McFadzen, & Christensen, 1990; Ross, Ceci, Dunning, & Toglia, 1994). Buckhout (1974) demonstrated the prevalence of unconscious transference, participants would watch crime footage and later be asked if they could identify the suspect from a line-up. The study found that approximately 25% of the participants identified an innocent bystander who was present during the crime.

Loftus and Greene (1980) found that participants were vulnerable to incorporating a co-witness's erroneous descriptions of a target into their memory reports. In the first experiment, participants viewed a crime and then read a hypothetical statement from a previous participant (co-witness), which included false information about the suspect's appearance. The study found that approximately one in three of the participants were susceptible to including the erroneous description of the offender when giving their own statement to the interviewer, relative to only one in twenty participants from the control condition. This was attributed to natural errors. In their second experiment, the researchers found that participants were also vulnerable to acting on these erroneous descriptions during an identification line-up. Sixty-nine percent of the participants who read a misleading narrative that falsely claimed the offender had a moustache picked out a foil with a moustache, whereas only thirteen percent of the participants from the control condition made this mistake. Although the co-witness misinformation within the study was presented indirectly, research suggests that the same effect is likely to be amplified when it is presented through a co-witness discussion (Gabbert et al., 2004). Similar findings were reported by Gabbert, Brewer, and Hope (2007), who also found that a witness's line-up performance was heavily influenced by their knowledge of how previous witnesses had performed.

In a slightly more recent study, Zajac and Henderson (2009) demonstrated the effects of co-witness discussions on memory recall and line-up identification. Participants ($N=79$) viewed a CCTV footage of a crime taking place and were later asked to discuss the footage with a confederate who had been instructed to falsely claim that the perpetrator had blue eyes (brown eyes in reality). When giving a suspect description, amongst the participants who had not discussed the event with a confederate, only 7.9% identified a person with blue eyes. However, amongst the participants who had discussed the event with the confederate, 66.7% had confidently claimed that the suspect had blue eyes. Of these conforming individuals, 85.7% were initially unsure about the suspect's eye colour,

suggesting that the effects of a co-witness influence are more significant when the targeted individual does not have a clear recollection. In regard to the line-up identification, participants who engaged in a co-witness discussion with the misleading co-witness were 47.2% likely to falsely choose a foil as the suspect, compared to only 23.6% of participants from the control condition. The findings from the study suggested that participants who were exposed to misleading information from co-witnesses were twice as likely to accuse an innocent person of committing a crime. In a second experiment, the participants were presented a line-up containing only brown-eyed members. This time, there were no differences in false-identification rates between the misinformation and control group, suggesting that the increase in misidentification rates within the first experiment will have been caused by the co-witness's misinformation. The effects of co-witness misinformation on line-up identification can be explained by considering the memory process behind identification. Witnesses who attempt to make an identification rely on their recognition memory to determine whether someone from a line-up can be matched to their memory of the incident (Radvansky, 2017). However, as discussed in chapter one, misleading post-event information could be integrated as a visual memory and resultantly, cause the witness to identify someone due to the familiarity between the chosen suspect and the post-event information (Loftus et al., 1978; Searcy et al., 2000).

3.4.2. Interpreting the event and blame conformity

Memory conformity indicates that an eyewitness can incorporate the misinformation of other co-witnesses into their personal memory reports when attempting to reconstruct an event (see Carlucci, et al., 2010; Davis & Meade, 2013; Garry et al., 2008). However, much of the literature discussed so far has only looked at the effects of co-witness influence on memory recall accuracy. Co-witnesses can also influence the way an individual interprets a witnessed event. Moreover, researchers have demonstrated that eyewitnesses can be influenced by other co-witnesses when attempting to determine which person from an incident is to blame, information that is highly central to the event (Thorley, 2015), a process first termed by Thorley and Rushton-Woods (2013) as *blame conformity*. Blame conformity refers to a sub-form of memory conformity. Where memory conformity is concerned with the act of conformity to any memory about an event, blame conformity is specifically concerned with the act of conformity to the blame attribution of another individual.

Although a relatively historic case, the Boston Massacre incident demonstrates how the malleability of blame attribution can have an effect on the criminal justice system. On the 5th of March 1770, a group of British Army soldiers shot and killed multiple members of an angry mob. The soldiers were tried for murder and there was controversy surrounding their commander, Captain Thomas Preston, who was accused by some for issuing the order to open fire on the civilians. There were discrepancies amongst the witnesses on who was to blame. Whilst some testified that they heard Captain Preston issue the order to open fire; another witness had claimed that the command had come from another soldier; and other witnesses contested that a soldier had fired his weapon on his own accord (Kidder, 1870; Zobel, 1970). Leading up to the trial, it is believed that propaganda had been distributed to influence the public's interpretation of the event. It is conceivable that many witnesses at the trial will have been influenced by these depositions, consequently leading to Captain Preston being acquitted. The Boston Massacre example demonstrates how the recollections and interpretations of, and subsequent blame attributions for, an event can deviate between co-witnesses, and — more importantly — how these interpretations can be influenced by external sources. A subsequent question to then ask is why the attribution of blame by eyewitnesses for a single event can be so malleable.

Whilst, the task of attributing blame also requires the individual to first retrieve information through recall memory, the process of attributing blame is significantly more cognitively demanding than general memory recall tasks. Moreover, it is a decision-making process that not only requires the witness to recall the central details to an event, but also requires them to interpret the information correctly in order to deliberate which potential suspect is at guilt (Remijn & Crombag, 2007). Due to the heuristic nature of blame attribution, an eyewitness may interpret a witnessed event differently from their co-witnesses and blame a different person, making blame attribution a relatively subjective process in comparison to conventional memory recall tasks. Of course, during many events where the victim can be clearly differentiated from the offender (such a robbery), there will be little contention regarding who is at fault. However, disagreements in eyewitness blame attributions are more prevalent during incidents where neither party can be clearly identified as a victim (such as a fight between two parties or a motor collision involving two drivers) or incidents where there may be multiple perpetrators present (such as the Boston Massacre incident). In addition, an individual who was involved in the incident or associated with someone who was, may be motivated to present co-witnesses with a false interpretation of the event, in an attempt to avoid persecution.

Research suggests that during an incident where determining who is at fault is not as easily clear, eyewitnesses can be influenced by co-witnesses when attributing blame.

Through using a misinformation paradigm, Thorley and Rushton-Woods (2013) showed participants ($N=156$) video footage depicting two men, in distinctively differently coloured clothing (one was wearing a brown t-shirt, the other was wearing a grey t-shirt), colliding into each other whilst crossing the road. Based on the nature of the collision, it could be deduced that neither person was particularly at blame, as both men were looking at an electronic device (MP3 player and mobile phone) whilst crossing the road. Participants were then presented with one of three statements from a supposed female eyewitness who was present during the incident. The three statements differed in one aspect: the person who was blamed for the collision. Participants either read that the man in brown t-shirt was to blame for the collision, the man in the grey t-shirt was to blame for the collision, or no mention was made about who was at fault (control group). The results found a significant association between who the co-witness had blamed for the collision and who the participants subsequently ended up blaming. More specifically, when the co-witness blamed the person in the brown t-shirt, 34.6% of the participants also made this blame attribution, relative to 0% of the participants from the control group. Similarly, when the co-witness blamed the man in the grey t-shirt, 38.5% of the participants also made this blame attribution, relative to 3.8% of the participants from the control condition. The majority of the participants in the control condition were unable to attribute blame to just one of the individuals.

In a later study, Thorley (2015) found that even when the ambiguity surrounding blame attribution was reduced (making it relatively easy to identify which person was to blame), participants were still vulnerable to blame conformity. Participants ($N= 168$) watched a crime video which depicted a man selling stolen goods to a woman within a pub. The footage depicted a man walking into a bar and attempting to sell a stolen camera to multiple participants, who refused. Eventually, the man approached three individuals who were sat at a table (one man and two women) and successfully sold the camera to one of the women. After viewing the footage, the participants read a statement from a (hypothetical) previous co-witness along with a photo of the witness, who was either an elderly woman or a younger female adult. The statement either blamed the correct woman, the incorrect woman, or did not specify which woman brought the camera (i.e. "one of the women bought the camera."). Later, when questioning the participants, Thorley found that when the co-witness did not blame the innocent woman, only 7.1% of the participants blamed her for buying the camera. However, when the co-witness blamed the innocent woman for buying the camera, 42.90% of the participants also blamed her for buying the camera. This effect of blame conformity was only present when the co-witness misinformation belonged to the young adult. When the same misleading co-witness

statement was presented by an elderly co-witness, there were no significant differences in false blame attribution rates.

Several implications can be drawn from the findings of Thorley (2015). Firstly, the study suggests that the participants had consciously chosen whether or conform to the co-witness, depending on the co-witness's characteristics. Thorley suggested that participants appeared less likely to perceive an elderly co-witness as having an accurate memory or good eyesight and would have therefore been less inclined to accept her judgement. As a result, it can be deduced that blame conformity will be predominantly caused by informational influence; or at the very least, that source monitoring errors would require the individual to first accept the information as being correct before it can be misattributed as witnessed information. Secondly, the study indicates that eyewitnesses can be influenced by co-witnesses into misinterpreting an event and consequently attributing blame to the wrong person, even when it is initially clear as to who is at fault. Further, the study demonstrated how easily innocent bystanders could be accused of committing a crime through co-witness influence. As discussed previously, innocent bystanders can be mistakenly blamed for committing a crime by eyewitnesses as a result of unconscious transference (Read, Tollestrup, Hammersley, McFadzen, Christensen, 1990; Ross, Ceci, Dunning, & Togliani, 1994). Theories on blame conformity would therefore suggest that individuals who possess an inaccurate reconstruction of the event (through either unconscious transference or an idiosyncratic mistake) will be at risk of contaminating the statements of their co-witnesses if they engage in a post-event discussion with them. As a result, the empirical studies within the present thesis primarily focused on the effect of co-witness influence as a product of blame conformity.

3.4.3. Eyewitness confidence

Exposure to co-witness misinformation can also influence the level of confidence a witness will have in their statement, which can consequently have an impact on their willingness to give evidence in court (Allwood, Knutsson, & Granhag, 2005; Luus & Wells, 1994; Semmler, Brewer, & Wells, 2004; Skagerberg & Wright, 2009). Exposure to co-witness misinformation can have varying effects on an eyewitness's confidence depending on their initial interpretation of the event, and whether they conform to the misinformation in their final report. In cases where the witness conforms to misinformation that contradicts their original recollection, research suggests that many witnesses would lose confidence in their reconstructed reports. Gabbert et al. (2003) compared the self-reported confidence

scores of participants who had been exposed to misinformation from co-witnesses with participants from a control group (no misinformation was presented). Their study found that younger participants (18-30 years) were less confident in their statements when recalling unwitnessed information. However, older eyewitnesses (60-80 years) exhibited the same level of confidence in their statements when recalling both witnessed and unwitnessed information, suggesting that the effects of co-witness discussions on eyewitness confidence may be mediated by the individual's age.

In cases where the witness encounters contradicting information but refrains from conforming to the misinformation, research suggests that exposure to the disconfirmatory information would reduce the witness's confidence in their memory report. Luus and Wells (1994) presented participants with feedback regarding their co-witness's responses during a line-up identification task. The study found that confidence deflation occurred when the participants were told that their co-witness's response contradicted theirs. However, although the study suggests that exposure to conflicting information can reduce a witness's confidence in their original recollection, other studies which have recreated the experimental paradigm have failed to find such a relationship between co-witness misinformation and confidence deflation (see Allwood et al., 2005; Skagerberg & Wright, 2009).

In cases where the witness already holds an incorrect recollection of the event prior to discussing the event with co-witnesses, research suggests that exposure to similar misinformation could cause the witness to gain more confidence in their erroneous memory (Allwood et al., 2006; Semmler et al., 2004). Allwood et al. (2006) presented participants with post-identification feedback in the form of a written statement from a previous participant. The study found that participants who were exposed to confirmatory feedback were more likely to report higher levels of confidence, relative to participants who had not received any feedback.

3.4.4. The effects of group discussion on memory recall

Although a large body of research has demonstrated the negative implications of co-witness discussions, a great proportion of these studies only observed the effects of co-witness discussions when participants were presented with erroneous co-witness information. Roediger et al. (2001) described such research as being 'one-sided', due to only emphasizing the negative effects of social influence. In reality, post-event information which is encountered during a co-witness discussion will not always be incorrect. Therefore, the risks of misinformation acceptance during real co-witness discussions will be lower than

predicted by the existing research. In addition, some researchers have debated whether collaborations between eyewitnesses could provide benefits to the investigation process by enhancing the performance of eyewitnesses (Paterson & Kemp, 2005; Zajac & Henderson, 2009). Therefore, a question worth addressing is whether a group discussion is beneficial or detrimental to memory performance, when misinformation is not purposely presented. In short, research indicates that group discussions can have both positive and negative effects on eyewitness performance. Clark, Stephenson, and Kniveton (1990) explained that collaborative recall facilitated more accurate recollections but simultaneously made the individuals more prone to misplacing their confidence in inaccurate recollections.

Arguments for the positive effects of co-witness discussions can be drawn from early research on collaborative recall. Previous research demonstrated that individuals who collaborated in groups during a memory recall task were able to make more accurate recollections than individuals who attempted to make recollections on their own (e.g., Hoppe, 1962; Stephenson, Brandstatter, & Wagner, 1983; Warnick & Sanders, 1980). Underwood and Milton (1993) found that collaborative groups slightly outperformed individual participants in memory recall accuracy. However, these differences were only observed when the participants had been warned that a critical accident was about to occur within the footage. Warnick and Sanders (1980) found that when misinformation was not deliberately presented during a co-witness discussion, participants who discussed the event produced more accurate reports about a witnessed crime in comparison to participants who had witnessed the crime individually.

Brown and McNeill (1966) suggested that participants who discussed the event with one another will have been able to provide each other with sufficient cues to trigger each other's memories, evoking a 'tip-of-the-tongue' reaction. As discussed earlier, many police officers seem to agree with the notion that co-witness discussions can provide benefits. Paterson and Kemp (2005) found that a large proportion of police officers in their survey believed that a group discussion amongst co-witnesses could benefit the individual performance of eyewitnesses, with 27.5% of the officers in the survey stating that they believed a co-witness discussion would prompt eyewitnesses to recall additional details that they may have otherwise forgotten.

However, many of the studies on collaborative recall have not been carried out within a forensic context. That is, the majority of research which has demonstrated a positive effect of group discussion on memory recall has involved participants providing their reports collaboratively rather than through giving individual statements privately. Thorley and Dewhurst (2007) measured memory recall accuracy between individual participants and participants who discussed their recollections in groups. The study found

that collaborative groups recalled slightly more correct items when providing their reports collectively. However, when asked to provide a private recollection, the study found no significant differences between participants who had discussed the items in a group and those who had not. Additionally, most research studies in favour of collaborative recall have produced evidence suggesting that collaborative groups perform better by comparing the recall of a collaborative group against an individual (Hinsz, Tindale, & Vollrath, 1997). When comparing the memory reports of collaborative groups with reports from the same number of non-collaborating individuals (nominal groups), researchers have found that collaborative groups are typically outperformed by the individuals (e.g., Basden et al., 1997, Basden, Basden, & Henry, 2000; Weldon, Blair, & Huebsch, 2000). Stephenson (1990) also argued that despite some research suggesting that collaborative recall provided benefits to the memory reports of eyewitnesses, there is also an abundance of evidence that suggests it could also have a negative impact on the witness's testimony. Through co-witness discussions, disagreement between witnesses may be camouflaged, hearsay may be rendered acceptable, evidence may be suppressed, and effective cross-examination prevented.

Weldon and Bellinger (1997) attributed the general under-performance of individuals in groups to collaborative inhibition, a counter-intuitive process whereby individuals within a collaborative group would perform less efficiently than if they were performing individually. One of the key causes for collaborative inhibition is the *retrieval disruption hypothesis*, which argues that exposure to conflicting information during memory recall can disrupt the memory retrieval process and consequently result in poorer memory recall (Basden & Basden, 1995; Basden et al., 1997; Dahlström et al., 2010). When individuals encode information, they develop an idiosyncratic organization of the information. Later, if the individual attempts to recall the information with others, exposure to the output of others can disrupt the individual's memory retrieval strategy, which can consequently reduce the amount of information that is correctly recalled. Another cause of collaborative inhibition can be social loafing: many individuals may purposely exert less effort in attempting to recall accurate information about the event if they are aware that others are contributing (Weldon et al., 2000). Regardless of whether the direction of co-witness conformity can point to correct or incorrect responses, it is evident that eyewitnesses would still be producing responses through the influence of others. Such behaviour would tarnish the independence of an individual's statement and would render their testimony as an inaccurate account of their experience. Therefore, the present thesis contends that attempts should be made by researchers and practitioners to reduce the prevalence of co-witness discussions and the consequent effects of co-witness influence.

Chapter 4: Factors Influencing Memory Conformity

4.1. General introduction to the chapter

Research indicates that eyewitnesses can be influenced by their co-witnesses when giving a statement (Carlucci et al., 2010; Garry et al., 2008; Hoffman, Granhag, See Kwong, & Loftus, 2001) and more specifically, when attributing blame (Thorley 2015; Thorley & Rushton-Woods, 2013). However, a consistent finding amongst these studies was that not all of the participants were influenced by their co-witnesses. The pre-existing literature indicates that some individuals seem to be more suggestible than others (Gabbert et al., 2003; Goodwin et al., 2012; Levett, 2011; Paterson et al., 2009). The observed individual differences in co-witness suggestibility suggest that some eyewitnesses may possess certain attributes that put them at a higher risk of being influenced by co-witnesses, relative to others. Alternatively, some co-witnesses may also possess certain attributes that make them more influential to other co-witnesses, than others. Further development of the current literature's understanding on co-witness suggestibility can provide significant benefits for both researchers and practitioners within the criminal justice system. By identifying the factors that can increase an eyewitness's susceptibility to being influenced by co-witnesses, both investigators and other professionals within legal settings will be able to use this information to assess the reliability of a certain eyewitnesses. In addition, by identifying the factors associated with co-witness suggestibility, police officers may be able to apply this knowledge to their interviewing techniques in order to help eyewitnesses avoid reporting post-event information that was not directly witnessed. It is therefore the intention of the present studies to identify the factors which can increase an eyewitness's susceptibility to memory conformity. As discussed in Chapter 3, the present thesis argues that blame conformity could be, perhaps, one of the most damaging forms of memory conformity, due to the fact that such behaviour could mislead investigators, contribute to the false conviction of an innocent individual and also allow the real perpetrator to avoid conviction. Owing to its significance, the thesis and current chapter pay particular attention to identifying the moderating variables that could have an impact on co-witness influence in relation to memory recall and subsequent blame attribution.

As discussed within the previous chapters, the act of memory conformity can be evoked by three different processes: Informational influence, normative influence, and source monitoring errors (Gabbert et al., 2003; Loftus et al., 1995; Wright, London & Waechter, 2009). Furthermore, research suggests that these processes can co-occur, meaning that the act of co-witness conformity can be motivated by multiple factors working

simultaneously (Loftus et al., 1995). Studies which have specifically looked at the process of blame conformity suggest that this form of co-witness influence is predominantly driven by information influence (Thorley 2015; Thorley & Rushton-Woods, 2013). However, there is no evidence to suggest that blame conformity cannot also be facilitated by normative influence or source monitoring errors. Therefore, in order to identify the factors that can increase an eyewitness's vulnerability to blame conformity, the current chapter reviews the existing literature surrounding the three psychological constructs associated with memory conformity.

The literature surrounding memory conformity has identified numerous factors which have been observed to increase an individual's tendency to conform to others (French et al., 2008; Gabbert et al., 2004; Liebman et al., 2002; Walther et al., 2002). These variables can be differentiated as internal and external factors. The internal factors refer to the inherent characteristics of an individual that make them more vulnerable to being influenced by co-witnesses (e.g. age, gender, personality type etc.). The external factors refer to the situational characteristics of the event, external to the individual, which can increase their risk of being influenced by co-witnesses (e.g. characteristics of the co-witness, number of co-witnesses presenting the information etc.). Through reviewing the existing literature, the present researcher identified three internal (age, gender and personality) and three external (group size, characteristics of information source and pre-existing relationship with information source) factors which have been frequently discussed amongst researchers, regarding their roles as mediators of memory conformity. These factors form the basis of the present thesis' empirical chapters. The current chapter offers a review of the literature on the relationship between these mediating factors and co-witness suggestibility.

4.2. Gender-related differences in co-witness suggestibility.

4.2.1. Informational influence

As discussed in chapter three, the primary cause of blame conformity (as well as memory conformity, in general) is informational influence (Thorley, 2015; Thorley & Rushton-Woods, 2013). Sistrunk and McDavid (1971) argued that the relationship between gender and susceptibility to informational influence was dependent on the task at hand. Moreover, they asserted that gender-related differences in informational influence would only exist if one gender struggled with the task at hand significantly more than the other. This is because for informational influence to be effective, the individual would have to believe that the source of the information is more likely to be correct than them (Suls &

Wheeler, 2000; Williamson et al., 2013). Therefore, an individual who exhibits greater levels of uncertainty at a task will be more reliant on the responses of others to obtain the correct answer. Based on this principle, a significant gender difference in eyewitness accuracy and confidence would be indicative of possible gender-related differences in co-witness suggestibility.

4.2.1.1. Gender-related differences in eyewitness performance

Eyewitness performance has typically been observed through memory tasks which have measured an individual's ability to recall an event (memory recall accuracy) or identify a previously witnessed suspect from a photo line-up (identification accuracy). With regards to the literature surrounding gender-related differences in eyewitness performance, the overall findings from previous research studies are contradictory (McKelvie, 1981). On one hand, numerous studies have suggested that there are no gender-related differences in memory recall accuracy (e.g. Barry, Bacon, & Child, 1957; Broverman, Vogel, Broverman, Clarkson, & Rosenkrantz, 1972; Clifford & Scott, 1978; Kuehn, 1974). Clifford and Scott (1978) found no significant gender differences in memory recall accuracy when recalling a non-violent incident. However, they found that when the crime being witnessed was violent, male eyewitnesses performed more accurately. Similarly, Kuehn (1974) found that men were more accurate in remembering violent crimes in comparison to women. Gender differences were attributed to female eyewitnesses' inability to produce accurate recollections, rather than male eyewitnesses excelling at the task (Broverman et al., 1972). It has been proposed that through gender stereotypical socialisation, many female eyewitnesses will have learned to be more fearful and vulnerable in violent encounters (Barry et al., 1957; Kuehn, 1974). Another explanation could be that female participants may have a greater inclination to avoid watching violent incidents, as research has shown the women show a greater dislike to viewing violence (Hoffner & Levine, 2009). The findings would suggest that in the context of witnessing a violent crime, female eyewitnesses could be more susceptible to informational influence and, thus, more vulnerable to co-witness influence. However, it must be acknowledged that the aforementioned theories on gender stereotypical socialisation are relatively outdated, with no recent studies supporting the claims. Therefore, the findings of Barry et al. (1957) and Kuehn (1974) may not have any relevance to eyewitness performance at present time.

In contradiction to the aforementioned observations, the majority of research on gender and eyewitness performance suggests that women hold a slight superiority in

eyewitness accuracy, both with regards to identification and recollection (Allport, 1961; Areh, 2011; Bruni, 1963; Hill et al., 1995; Hultsch et al., 1991; Larrabee & Crook, 1993; McKelvie, Standing, St. Jean & Law, 1993; Megreya et al., 2011; Rehnman & Herlitz, 2007; Seidlitz & Diener, 1998; Smith, 1966; Washlin et al., 1993; West et al., 1992; Zelinski et al., 1993). Yarmey (1993) was able to demonstrate this difference in memory recall using a more naturalistic method for observing eyewitness recall accuracy. The study adopted a more realistic approach, in comparison to traditional laboratory studies, by incorporating an observational design. Pedestrians were approached by a female actress who engaged in a short discussion with them. Later, the participants were asked by an experimenter to recall the female's physical characteristics. The findings indicated that female participants were significantly more accurate in identifying the actress's physical characteristics than male participants. It could be argued that, due to the actress being a woman, the results may have been caused by own-sex identification biases (see Mazanec & McCall, 1975; McKelvie, 1981; Yarmey & Jones, 1983), giving the female participants an advantage. However, additional research has produced similar results after controlling for such biases (see Megreya et al., 2011; Rehnman & Herlitz, 2007). Moreover, it has been suggested that these gender differences in memory recall could be a result of differing cognitive strategies used between men and women when recalling information (Halpren, 2000; Mazanec & McCall, 1975). Halpren (2000), and Mazanec and McCall's (1975) theory is supported through the analysis of brain lateralization — Neurological observations have identified clear gender differences in brain lateralization when individuals attempt to process and retrieve information (Wager, Phan, Liberzon & Taylor, 2003). More specifically; related to memory recall, Speck et al. (2000) observed brain activation of participants during working memory tasks. The study found women to perform with significantly higher accuracy than men in the working memory tasks, concurring with the existing research. Moreover, the study found that women showed far more brain activation of the left hemisphere when carrying out the working memory tasks, whereas men showed more bi-lateral or right hemisphere activation. The researchers deduced from the data that women's abilities to recall more accurate information may be due to the gender-differences in problemsolving strategies. Additionally, research has suggested that females possess slight advantages in storing short-term memory (Jensen, 1998; Knox, Seth, Mcelveen, Bergstein & Longo, 2007) and episodic memory (Herlitz & Rehnman, 2008; Tulving, 1993; Zelinski et al., 1993), which would allow them to make more accurate recollections. If women do perform better than men in memory recall, this might indicate that they will be less reliant on external information and thus less susceptible to informational influence.

An explanation for the conflicting results within the literature can be attributed to the variations of methodologies adopted by different researchers. Research has consistently

shown that individual differences in eyewitness recall and facial recognition can be dependent on the characteristics of the event (Barry et al., 1957; Keuhn, 1974) and person of interest (Areh, 2011). For instance, studies show that individuals will typically perform better at recalling the characteristics of an individual who they share greater similarities with (i.e. gender, see Megreya, Bindemann, & Havard, 2011; or race, see Meissner & Bringham, 2001). Therefore, variations in experimental stimuli between studies could elicit different observations in gender differences.

Although the majority of the literature suggests that women seem to have an advantage in recalling the characteristics of an individual, research shows that men excel in recalling the incident itself. Areh (2011) conducted a laboratory study on eyewitness accuracy. The study possessed good external validity, due to participants being told that their answers would be used to identify the offender, inducing similar investigator effects that would be present during a real eyewitness interview. The study found that women were far more accurate in recalling an offender's characteristics, which would suggest that female eyewitnesses would perform better at describing a crime suspect or identifying the suspect from a line-up. However, the study found that men were more accurate in recalling the incident as a whole, which would suggest that male eyewitnesses may be relatively better at general recall for an incident and attributing blame in comparison to female eyewitnesses. As a result, male eyewitnesses may be less susceptible to blame conformity.

4.2.1.2. Gender-related differences in confidence

Despite the evidence indicating that women perform better in most memory recall tasks, research on the confidence judgments of eyewitnesses shows that men are significantly more confident in giving statements, even when they are incorrect (Areh, 2011; Fox & Puncochar, 1994; Yarmey, 1993). Furthermore, Instone, Major, and Bunker (1983) found that women tended to be less confident than men in their general abilities (although this was measured in a non-forensic setting). Based on the principle that informational influence is dependent on an individual's perceived self-ability relative to the information source (Williamson et al., 2013), the overconfidence of men might suggest that they would be less susceptible to informational influence than women, despite being less accurate than them.

4.2.2. Source monitoring

With regards to gender-related differences in source monitoring; Loftus et al. (1992) produced evidence that during memory recall tasks, male eyewitnesses were more likely to misattribute post-event information as witnessed information than female eyewitnesses. This difference could be due to women possessing greater abilities in the rehearsal of memory and retrieval of information (Seidlitz & Diener, 1998). However, the findings of Loftus and colleagues have since been disputed by more recent research, with numerous studies failing to find any gender-related differences in an individual's susceptibility to making source monitoring errors (Pishkin, 1960; Roebbers & McConkey, 2003; Smeets et al., 2006). The discrepancies between the research studies can be attributed to the way in which the researchers have attempted to identify source monitoring errors. Typically, a *misinformation effect paradigm* (see Chapter 2) has been used to determine an individual's susceptibility to misattributing post-event information as witnessed information (Gabbert et al., 2004; Garry et al., 2008; Greene et al., 1982). However, the internal validity of using such a paradigm for observing source monitoring errors can be questionable. This is because research has demonstrated that, within the misinformation effect paradigm, participants can incorporate post-event information into their memory reports through various other psychological processes as well (such as informational influence; Loftus et al., 1995). Therefore, contradictions regarding gender-related differences in source monitoring abilities may be attributed to some of the studies failing to accurately identify source monitoring errors.

4.2.3. Interpersonal behaviour and normative influence

Sex differences in the interpersonal behaviour of eyewitnesses can also have an effect on their susceptibility to co-witness influence. Research indicates that women are more likely to discuss emotionally-charged events with others around them (Birditt & Fingerman, 2003; Harshman & Paivio, 1987). Therefore, within an eyewitness setting, individuals who actively seek to discuss the event with co-witnesses will be more likely to be exposed to the judgements of others; this can be problematic if the judgments of the co-witnesses are false. However, despite evidence suggesting that female eyewitnesses would be more likely to engage in post-event discussions, previous surveys on real eyewitnesses have failed to investigate this hypothesis (e.g. Paterson & Kemp, 2006a; Skagerberg & Wright, 2008a).

Shapiro and Penrod (1986) found in their meta-analysis that, despite performing better in facial recognition than men, female eyewitnesses were more prone to making erroneous statements. The researchers attributed this to female eyewitnesses exhibiting an increased desire for compliance to their investigator; as a result, female eyewitnesses would state as much information as they could recall. This heightened need for performance could consequently influence female witnesses to recall information that they learned from other co-witnesses, if they perceive the information as being correct.

In relation to the gender-related differences in normative influence; Eagly (1978) produced data suggesting that women were more likely to conform in social situations. This difference was attributed to women possessing a greater concern with maintaining social harmony and preventing group conflict, as well as men possessing an innate preference for being resistant to conforming in public settings (Eagly, Wood & Fishbaugh, 1981). The findings suggest that female eyewitnesses will be more likely to conform to co-witnesses through heightened normative pressures. However, more recent research has produced evidence which suggests that females may not be more susceptible to normative pressures than males (Steinberg & Monohan, 2007; Sumter, Bojhorst, Steinberg, & Westenberg, 2009). Furthermore, gender differences in normative influence would only be relevant in a context where the eyewitnesses gave their statements collectively. In reality, police investigators are typically trained to collect statements privately (Williamson et al., 2013). Therefore, a witness's statement would bear no group-related repercussions and, thus, the level of normative influence would be significantly reduced.

4.2.4. Research on gender and memory conformity

To date, no existing research has attempted to investigate the relationship between an eyewitness's gender and their susceptibility to blame conformity. However, several studies have attempted to investigate the relationship between eyewitness gender and co-witness suggestibility during memory recall and line-up identification tasks (memory conformity). When attempting to investigate gender differences in memory conformity, the existing research within the literature can be inherently contradictory. Multiple studies have produced evidence indicating that male eyewitnesses are more susceptible to co-witness misinformation (Eck et al., 2008; Loftus et al., 1992). Using the memory conformity paradigm (described in Chapter three), Eck et al. (2008) found that male participants were significantly more likely to recall unwitnessed items that were suggested to them by a co-witness, in their statements, compared to female participants. Conflictingly, there is

evidence which suggests that there are no gender differences in susceptibility to co-witness influence (Butts et al., 1995; Schwarz, 2013). Using the social contagion of memory paradigm (described in Chapter three), Schwarz (2013) observed that male and female participants were equally as likely to be misled by a confederate in recalling and reporting unwitnessed information. Schwarz's results lie in agreement with the earlier research of Sistrunk and McDavid (1971), which suggested that no gender-related differences existed in general social conformity. The differences in results between the studies can be attributed to each study incorporating varying memory recall tasks, as the process of social influence is highly dependent on the task at hand (Baron et al., 1996; Suls & Wheeler, 2000).

It must be acknowledged that the validity of the majority of existing research on gender and memory conformity can be questionable. For instance, the studies of Schwartz (2013) and Eck et al. (2008) were based on undergraduate projects, with the latter study's findings being generated from a sample of only 61 participants. As a result, the observed gender differences may have been caused by an insignificant sample. Butts et al. (1995) also investigated gender differences in eyewitness testimonies, and found no significant differences in resistance to misinformation. The paper provides further evidence in support of Schwartz (2013). Although the study used a reliable and validated experimental design (social contagion of memory paradigm), the study recruited an even smaller sample of only 40 participants, making the reliability of the results dubious.

To date, the majority of research on co-witness suggestibility has investigated the effects of an eyewitness's gender on memory tasks involving the recollection of items within an event. Although such designs can explain how eyewitnesses can misidentify a specific item, they fail to measure the effects of co-witness influence on blame attribution, leaving this area of research unaccounted for. Resultantly, there is gap within the research literature regarding the relationship between an eyewitness's gender and their susceptibility to blame conformity.

4.2.5. Limitations of previous research

4.2.5.1. Sample size

The literature on gender and co-witness influence is relatively scarce. Of the relevant papers, many had small sample sizes. Tabachnick and Fidell (2007) stated that, to hold scientific value, a study's sample size must adhere to the formula $N > 50 + 8m$, with m representing the number of independent variables. Two of the most relevant studies to the present work: Eck et al. (2008) and Butts et al. (1995), recruited a small sample size (61 &

40, respectively). Neither study's sample size satisfied the law of Tabachnick & Fidell on producing data that could hold scientific value in its generalisability.

4.2.5.2. Small group size

The majority of the studies on memory recall and social influence used experimental designs where participants were typically placed in a small group of three or even in a pair. However, a disadvantage of smaller groups and pairs was that participants would be interacting with a small majority size of two or even none (when placed in a pair). Asch (1955) argued that, as well as being unanimous, it is essential for the majority to be of sufficient size so that their judgement cannot be deemed as being idiosyncratic. Bond (2004) demonstrated that for social influence to be effective a minimum majority size of three was necessary. Further, Eagly (1978) argued that women's greater concern for group harmony and prevention of conflict would motivate them to become more conforming in social situations. It can be argued that the level of potential group conflict would be too insignificant in a group of three individuals to motivate female participants to conform, suggesting that a gender difference in conformity may only be present in larger groups. Therefore, studies observing the effects of co-witness influence should measure behaviour within different group sizes, to determine if the size of the group could have a moderating effect.

4.3. Age-related differences in co-witness suggestibility

The bulk of previous research on co-witness conformity has relied on student samples, due to their convenience and availability (e.g. Gabbert et al., 2006; Goodwin et al., 2012; Shaw et al., 1997), leading Loftus et al. (1992; page 93) to refer to them as the 'fruit flies of psychology'. Although such sampling methods can allow for faster and larger samples to be recruited, they will consequently lead to the research being mainly representative of university students who are typically young adults. However, the researcher acknowledges that in more recent years, the proportion of mature university students has increase — with 10% of UK university students in 2015 being above the age of 40 (UCAS, 2015). Therefore, it can be argued that more recent studies using university students may have incorporated a slightly more diverse age range. In lieu of this, the present research argued that research focusing on eyewitness behaviour should still carry

out precautions to incorporate a diverse sample of mixed ages, considering that only a small percentage of real life eyewitnesses will be young adults.

4.3.1. Informational influence

4.3.1.1. Age-related differences in eyewitness accuracy

Due to informational influence being dependent on a person's perceived ability to perform accurately at a task (see Sistrunk and McDavid, 1971), it is worth reviewing the literature surrounding age and eyewitness accuracy to gain an accurate understanding of the possible age-related differences in eyewitness suggestibility. When looking at age-related differences in eyewitness performance; there is general agreement within the literature that elderly eyewitnesses are far less accurate than their younger counterparts in both memory recall (Blackman & Nilsson, 1984; Dodson et al., 2007) and suspect identification (Adams-Price, 1992; Memon, Bartlett et al., 2003; O'Rourke, Penrod, Cutler & Stuve, 1989; Searcy et al., 1999), with many studies indicating that the inaccuracy of elderly eyewitnesses comes more specifically in the form of false-alarm identifications (identifying the wrong individual as an offender or wrong item as being present during the incident)(Searcy et al., 1998; Yarmey, 1993). Memon et al. (2003) examined age differences in eyewitness identification accuracy and found that older (60-82 years) eyewitnesses were significantly less accurate than younger (16-33 years) eyewitnesses. The study offers a reliable indication of age-related effects on eyewitness identification accuracy. However, a limitation of the paper was that the study measured age through a dichotomy of two extremes. The categorisation of the participants does not allow the researchers to identify if this relationship is linear and does not indicate how middle-aged eyewitnesses are likely to perform. With regard to eyewitness testimonies (memory recall), Yarmey (1993) conducted an observational study on age and eyewitness recall. Unlike the study of Memon et al. (2003), the study divided age groups into three categories: young adults (18-29), middle-aged adults (30-44) and older adults (45-65). The study found that younger adults were superior in memory recall accuracy to middle aged adults, who in turn were more accurate than older adults. However, an issue with Yarmey's experiments was that participants had to recall the characteristics of a young woman. Studies have previously identified that individuals pay more attention to others who they feel they can relate to better (Brigham & Malpass, 1985; Davies, 1993). Therefore, the use of a younger person as the stimulus may have allowed the younger participants to excel during the memory recall

task due to them being more familiar with, and interested in, younger adults - therefore raising questions as to the validity of results. Together, the findings of Yarmey (1993) and Memon et al. (2003) suggest that elderly eyewitnesses generally perform less accurately than their younger counterparts (in both recollection and identification). When comparing these two studies however, it must be noted that Memon et al.'s (2003) study used 60-85-year-old participants for their 'older group' sample whereas Yarmey's (1993) study on age and memory recall used participants aged 45-65. This contrast in age groups would suggest that more empirical evidence would be required to fully determine the memory recall abilities of elderly individuals over 65.

The reduced level of eyewitness accuracy in memory recall amongst elderly individuals is often due to age-related deficits in their episodic memory (Naveh-Benjamin et al., 2003; Nyberg et al., 1996). The process of recalling a witnessed event requires the use of one's episodic memory (Levine, Svoboda, Hay, Winocur, & Moscovitch, 2002); therefore, a deficit in the ability to recall from episodic memory could explain the significantly less accurate identifications made by older eyewitnesses within the literature. As well as episodic memory, elderly individuals are also likely to possess weaker visuospatial memory skills (Moffat, Zonderman & Resnick, 2001). Searcy et al. (1999) identified age-related deficits in visuospatial memory as a contributing factor for the relatively poor identification and recall accuracy of older eyewitnesses. They suggested that an elderly eyewitness's inability to mentally simulate an event would significantly reduce their ability to accurately recall the incident. In relation to identification errors, Memon et al. (2003) attributed the age difference in identification accuracy to older eyewitnesses possessing a deficit in source-recollection. As a result of poor source-recollection skills, older eyewitnesses are said to have an inability to remember where or when they may have seen a particular face (Cohen & Faulkner, 1989; McIntyre & Craik, 1987; Schacter, Osowiecki, Kaszniak, Kihlstrom, & Valdiserri, 1994). Consequently, they would be more likely to attribute a familiar face to the wrong witnessed event and, as a result, falsely identify the wrong individual as the offender.

Although a significant relationship has been established between age and identification accuracy, some research has identified that there is no significant effect of age in event recollection, which would suggest that there may not be any age-related differences in eyewitness blame attribution (Adam-Price, 1992; Searcy et al., 1998). As mentioned previously, the conflicting findings within the literature could be due to the differing methodologies being employed by different researchers. As well as the characteristics of the witnessed individuals, procedural factors such as the length of duration between witnessing the event and giving a response could have a mediating effect on the accuracy of some participants (Mudd & Govern, 2004). Therefore, despite the

literature suggesting that older eyewitnesses may be more susceptible to informational influence during a line up identification, there is no empirical evidence to suggest that they would necessarily be more susceptible to blame conformity.

4.3.1.2. Age-related differences in eyewitness confidence

The disadvantage in reconstructing the event could potentially influence older eyewitnesses to becoming more receptive to the information of co-witnesses and, thus, more susceptible to informational influence. However, this theory operates on the assumption that older eyewitnesses would be aware of their potential inaccuracies. If older eyewitnesses are, in fact, more confident in their judgements than younger participants, this could suggest that they may be less susceptible to informational influence. Unfortunately, the literature is once again at a disagreement. With regards to age and eyewitness confidence; Searcy et al. (1998) found no significant differences in line-up identification confidence between older and younger adult eyewitnesses, despite older participants in the study reporting lower confidence in their general memory abilities beforehand.

However, Gabbert et al. (2003) compared the self-reported confidence scores of participants who had been exposed to misinformation from co-witnesses with participants from a control group (no misinformation was presented). Their study found that younger participants (18-30 years) were less confident in their statements when recalling non-witnessed information. However, older eyewitnesses (60-80 years) exhibited the same level of confidence in their statements when recalling both witnessed and unwitnessed information, suggesting that the effects of co-witness discussions on eyewitness confidence may be mediated by the individual's age. In a different study, Cohen and Faulkner (1989) found that older eyewitnesses (60-83 years) were significantly more confident in their erroneous statements than younger eyewitnesses (24-39) after encountering misinformation. Overall, the literature on age and eyewitness confidence suggests that despite older eyewitnesses exhibiting similar levels of confidence in their memory reports, they are more likely to be overconfident when reporting co-witness misinformation, which could consequently increase their willingness to give evidence in court (Allwood et al., 2005; Luus & Wells, 1994; Semmler et al., 2004; Skagerberg & Wright, 2009), as well as their level of influence over other co-witnesses (Goodwin et al., 2012; Schneider & Watkins, 1996).

4.3.2. Source monitoring

Research on human memory has consistently demonstrated that, relative to younger adults, older adults are more prone to making source monitoring errors when attempting to recall information (Ferguson et al., 1992; Glisky et al., 2001; Henkel et al., 1998; Memon, Bartlett, Rose, & Gray, 2003). The link between age and inaccurate source monitoring could suggest that older eyewitnesses are more likely to incorporate a co-witness's misinformation into their own memory reports. The inability to differentiate between witnessed information and post-event information could consequently lead to older eyewitnesses drawing on misinformation from co-witnesses when attempting to reconstruct the event (Memon et al., 2003).

4.3.3. Research on age and memory conformity

The age of an eyewitness has been found to have a moderating effect on the individual's suggestibility to misleading questions when attempting to provide a statement (Coxon & Valentine, 1997; Dodson & Krueger, 2006; Mitchell et al., 2002). Dodson and Krueger (2006) found that when younger (17-23 years) and older adults (60-79 years) were matched on their overall memory accuracy, the older eyewitnesses were more likely to recall seeing events in a video that had only been mentioned in a subsequent questionnaire (post-event information). The authors attributed the heightened level of suggestibility to the older eyewitness's tendencies to misattribute the post-event information as witnessed information. However, the psychological processes that engender misinformation acceptance from misleading questions can be different to the processes that prompt misinformation acceptance from co-witnesses (Paterson & Kemp, 2006b). Additionally, participants will be likely to perceive information that is provided to them by an experimenter as being correct (Roebbers & Schneider, 2000), whereas when presented with information from another participant, many individuals will be more inclined to reject the information, especially if it contradicts with their own recollection (Hope et al., 2008). Therefore, more direct research is needed to determine the relationship between age and co-witness suggestibility.

When looking at the effects of co-witness influence, Gabbert et al. (2003) found no age-related differences in co-witness suggestibility. Using the memory conformity paradigm, the study found that although participants were susceptible to conforming to each other, there were no significant differences between the age groups (18-30 vs. 60-80) with

regards to conformity rates when attempting to provide a statement. However, in a later study, Gabbert et al. (2004) found that younger adults (17-33 years) were more susceptible to incorporating their co-witness's misinformation into their own memory recall reports, compared to the older adults (58-80 years). The researchers attributed this to younger adults exhibiting greater levels of normative influence due to their heightened need for social acceptance, relative to older adults. The discrepancy between the studies could be attributed to the slight differences in experimental designs. Gabbert et al., (2003) showed pairs of participants altered videos from each other to allow them to expose each other to unwitnessed information (memory conformity paradigm), whereas Gabbert et al., (2004) used confederates to expose participants to unwitnessed information (social contagion of memory paradigm). Nonetheless, both studies indicate that an individual's susceptibility to co-witness influence does not seem to bear a simple relationship to memory accuracy (i.e. elderly eyewitnesses being more vulnerable to co-witness influence), as the theories on informational influence would predict. This may be due to older eyewitness's being more confident in their reports, despite possessing weaker memory. In relation to blame attribution; there is a gap within the literature with regards to the effects of age on an individual's susceptibility to blame conformity, highlighting a further need for empirical research to determine whether age-related differences in blame conformity exist.

4.3.4. Limitations of previous research: Age as a nominal variable

Research studies that have attempted to measure the effects of age on co-witness suggestibility have done so through measuring age as a categorical variable. Such a subjective form of classification could facilitate improper grouping. For example; if a study categorises participants who are over the age of 50 as elderly and participants who are under the age of 50 as middle-aged, it makes an assumption that a 49-year-old and 51-year-old participant are significantly different in age, when this is not the case. Many research studies, such as Gabbert et al. (2003), attempted to reduce the risk of miss-categorisation by creating a gap between the two age groups. The study recruited participants that were either aged 18-30 (young adults) or 60-80 (elderly adults). By filtering a sample like this, however, the paper had to work with a much smaller sample size of 40. In addition, although the method identified two clear separate age groups, the study ignored eyewitnesses who would fall between the two age groups (31-59) and, thus, the results cannot confidently be used to make inferences about eyewitnesses that would fall into the absent age bracket. As a result, it can be suggested that research investigating the effects of age on co-witness influence should measure the variable on a continuous scale.

4.4. Personality and Co-witness suggestibility

Using the misinformation paradigm (see Chapter 2), Powers, Andricks, and Loftus (1979) found that participants subjected to identical experimental conditions varied in both memory recall accuracy and suggestibility when giving a statement. The variance in eyewitness suggestibility has led many researchers to suggest that an eyewitness's level of suggestibility (to both interviewers and co-witnesses) may also be related to individual differences in personality (Doughty et al., 2017; Loftus, 2005; Wright et al., 2009). Personality is a multifaceted concept that refers to individual differences in the way a person thinks, feels and behaves (Kazdin, 2000). An individual's personality is affected by the development of the individual through learnt responses, memories, attitudes and social relationships (Engler, 2009). The term 'personality trait' refers to consistent patterns in the way an individual behaves, feels or thinks (Pervin & Cervone, 2014).

4.4.1. Personality and misinformation acceptance

There is currently a severe lack of research investigating the relationship between personality differences and co-witness suggestibility. However, due to the significant implications and notable cases relating to investigative coercion, a large body of research has attempted to observe the relationship between personality traits and eyewitness suggestibility to misleading interviews (see Gudjonson, 1988; Merckelbach, Muris, Rassin, & Horselenberg, 2000; Trouve & Libkuman, 1992; Ward & Loftus, 1985). Despite the difference in misinformation source, comparative research suggests that the effects of interrogative suggestibility are homogenous with the effects co-witness suggestibility (Jack et al., 2014; Thorley, 2013). Therefore, the research on personality differences in eyewitness suggestibility to misleading questions can be used to gain a rudimentary understanding of the possible personality predictors of co-witness suggestibility.

One of the earliest studies to investigate the relationship between personality traits and interrogative suggestibility was that of Ward and Loftus (1985). The study measured personality using the Myers-Briggs Type Indicator (Myers and Briggs, 1962), dichotomising participants' personality types to i) intuition vs sensing and ii) introversion vs extroversion. Although the study found no significant differences between personality types and eyewitness recall accuracy, the results did indicate a clear significant relationship between personality traits and susceptibility to post-event misinformation. Subjects who were classed as introverts were significantly more likely to be influenced by misleading post-

event information. Additionally, intuitive subjects were also significantly more likely to be influenced by misleading post-event information. Unsurprisingly, participants who were classed as both introverted and intuitive were at the highest risk of being influenced by the misleading post-event information. An explanation for the relationship between introversion and eyewitness suggestibility (to both, co-witnesses and interviewers) is that the reserved nature of introverts and their lack of assertiveness would make them more inclined to be compliant and pressured by others (Gudjonsson, Sigurdsson, Bragason, Einarsson, & Valdimorsdottir, 2004). The study of Ward and Loftus (1985) did, however, bear a methodological limitation in the way that the study measured personality traits. Rather than analysing the measures of personality on a scale, both of the aforementioned personality traits were dichotomised, based on the majority scores of the questionnaire. This means that a subject who scored as being only slightly more introverted than extroverted would have been classified as being the same (introvert) as an individual with extreme levels of introversion and no extrovert tendencies. Measuring personality traits on a scale would allow for a much more accurate observation of the relationship between personality characteristics and susceptibility to misinformation. This is because an independent variable with ordinal values would allow for more comparisons to be made between datasets.

In contrast, multiple studies have produced results that contradict Ward and Loftus (1985). Trouve and Libkuman (1992) produced results which indicated that extroverted individuals were, in fact, more susceptible to misinformation acceptance than introverted individuals. More relevant to the present study; Pozzulo, Crescini, Lemieux, and Tawfik (2007) attempted to investigate the relationship between personality traits and co-witness suggestibility. Participants viewed an incident and were then presented with a misleading statement from a (hypothetical) previous participant, before being subjected to a recall task. The study found no significant difference between shy and non-shy eyewitnesses in suggestibility to misinformation. Although shyness is not a subcategory of introversion, both traits are similar in their expressions (Henderson & Zimbardo, 2010). Thus; the study can also be deemed as contradictory to the results of Ward and Loftus (1985).

The differences between the Ward and Loftus (1985) study and the latter studies may have been due to the use of different misinformation sources. Ward and Loftus introduced the misinformation through misleading questions from an interviewer, whereas Trouve and Libkuman (1992) and Pozzulo et al. (2007) both presented misinformation through non-social methods (misleading questionnaire and misleading statement, respectively). As a result, the introverted participants from Loftus and Ward's study would have been more likely to conform, in order to avoid social conflict; whereas in the other studies, the reduction in social pressure would have allowed the introverted/shy participants

to reject the misinformation easily. These discrepancies suggest that the relationship between personality and eyewitness suggestibility will be heavily dependent on the task at hand. Therefore, caution must be taken when making assumptions about co-witness suggestibility based on the findings of research which have presented misinformation to participants through non-social sources.

In her review of the misinformation effect, Loftus (2005) identified several additional personality traits that have been repeatedly associated with misinformation acceptance during memory recall, by previous research. Such traits included *empathy*; Tomes and Katz (1997) found that emotionally empathetic individuals were more habitually susceptible to accepting post-event misinformation. Loftus also identified *self-monitoring* as a predictor of eyewitness suggestibility, Mullen (1987) suggested that the more attention was focused on the self, the more an individual would attempt to match their attitudes to that of the people around them. *Absorption* was also identified; Platt, Lacey, Iobst, and Finkelman (1998) identified a negative relationship between scores on the Tellegen Absorption Scale and memory distortions, which was correspondingly associated with the acceptance of false memories. In addition, Wright and Livingston-Raper (2002) also found that approximately 10% of the variance in misinformation acceptance within a non-clinical sample was accounted for by disassociation scores. Although many of the above studies were based on eyewitness suggestibility to misleading interviews, comparative research suggests that the psychological attributes of interrogative suggestibility are concurrent with that of co-witness suggestibility (Jack et al., 2014; Thorley, 2013).

Some more general personality assessments have also been able to determine an individual's vulnerability to co-witness influence. Using the Ten-Item Personality Questionnaire (TIPI; Gosling, Rentfrow, and Swan, 2003), Doughty, Paterson, MacCann, and Monds (2017) found that participants who scored lower on measures of openness, extraversion and neuroticism were significantly more susceptible to memory conformity, relative to higher scoring participants. Further, Liebman et al. (2002) displayed a range of personality inventories (NEO OI- Revised; the Multidimensional Personality Questionnaire; Locus of Control; and Memory Efficacy) which could reliably predict the suggestibility of eyewitnesses to misleading questions. More specifically; the study found that eyewitnesses with a high external locus of control, low memory efficacy and/or high levels of neuroticism were significantly more vulnerable to interrogative suggestibility.

4.4.2. Interpersonal characteristics and co-witness suggestibility

Whilst observations on general personality differences have allowed researchers to identify the fundamental predictors of eyewitness suggestibility, the present thesis argues that co-witness suggestibility could be predicted more accurately by observing the interpersonal characteristics of eyewitnesses. This is because the informational and normative pressures of conformity are heavily mediated by the interpersonal characteristics of the targeted individual (Cialdini & Goldstein, 2004; Glomb & Liao, 2003; Heerdink, van Kleef, Homan, & Fischer, 2013), due to the exchanging of information between individuals being a highly social interaction (Gabbert et al., 2004) and the act of conformity being an interpersonal behaviour (Bass, 1960). The relationship between some interpersonal characteristics and eyewitness suggestibility have been demonstrated by previous research.

Zhu et al. (2010) found that certain interpersonal characteristics could predict an individual's risk of incorporating misleading post-event information into their memory recall reports. More specifically; cooperativeness and reward dependence (interpersonal characteristics related to a concern of satisfying other individuals, as well as gaining their approval; Cloninger, 1998) were found to be significantly linked to misinformation acceptance. However, the study bore multiple limitations. Firstly, the procedure used a presentation of still images rather than video footage for the witnessed stimulus, which significantly reduces the study's ecological validity. Secondly, the misinformation was not presented through a social medium; instead, participants read the misinformation off a sheet. This will have reduced the level of social pressure exerted on the participant significantly, as well as reducing the experiment's ecological validity. More relevant to the present study (by looking at co-witness influence), Wright et al. (2009) were able to identify a link between interpersonal characteristics and co-witness suggestibility. They found that individuals with higher levels of social anxiety were more vulnerable to being influenced by a co-witness during memory recall, due to a greater fear of negative evaluation making them more susceptible to normative influence. These findings fundamentally suggest that the individual differences in co-witness suggestibility may be accurately accounted for by the witness's interpersonal characteristics. However, to date there is a lack of research investigating the interpersonal correlates of co-witness suggestibility (with the exception of Wright et al., 2009).

4.4.3. Predicting co-witness suggestibility

The ability to identify vulnerable eyewitnesses can have significant benefits within a legal context. Through identifying witnesses who would be at a higher risk of reporting unwitnessed information, jurors and legal professionals would be able to assess the reliability of their statements more accurately. This, in turn, may help reduce the risks of false convictions. In addition, through identifying the underlying causes for co-witness suggestibility, investigators may be able to work on implementing interventions to prevent vulnerable eyewitnesses from reporting non-witnessed information.

A potentially suitable measure of interpersonal characteristics is the Temperament and Character Inventory-Revised (TCI-R) Scale, a psychological construct that attempts to measure an inventory of personality traits through a 240-item questionnaire (Cloninger, 1999). The inventory was constructed as seven multiple subscales: Novelty seeking (NS), Harm avoidance (HA), Reward dependence (RD), Persistence (PS), Self-directedness (SD), Cooperativeness (C), and Self-transcendence (SD). The model has been acknowledged and widely used by researchers in an array of research on personality, including studies on the learning of personality, stability of traits and cultural differences (Cloninger & Svrakic, 1992; Corr, Pickering, & Gray, 1995; Svrakic, Przybeck, & Cloninger, 1991; Svrakic, 1993; Farmer et al., 2003; Sigvardsson, Bohman, & Cloninger, 1987). However, within the literature there is a compilation of more recent research studies that have failed to support the validity of the TCI-R as a psychological model of personality (see Ando et al., 2004; Chapman, Mayer, Specht, Farmer, & Field, 2003; Comings, Gonzales, Saucier, Johnson, & MacMurray, 2000; Gana & Trouillet, 2003; Hansenne et al., 2000; Herbst, Zonderman, McCrae, and Costa 2000; Newman et al., 2000). Farmer and Goldberg (2008) evaluated the psychometric properties of the TCI-R. Through confirmatory factor analysis (CFA), the paper produced data that did not support the associations made by the model between TCI-R facet scales and their domains. The results also suggested that there was some possible multicollinearity between the facets RD and C. Further, additional CFA tests highlighted the scale's main limitation as failing to differentiate between multiple facet sub-scales, with five out of the 29 sub-scales displaying relatively low internal consistency. Therefore, the present study disregarded the TCI-R as a suitable scale for accurately measuring participants' interpersonal characteristics.

One tool which has repeatedly been used to identify potential interpersonal correlates of conforming behaviour is the Fundamental Interpersonal Relations Orientation-Behaviour assessment (FIRO-B; Schutz, 1958) (see Huertas & Powell, 1986; Willcoxson & Chatam, 2006). Despite being a relatively dated psychometric tool, the assessment has

been validated by more recent research on US, UK and Australian-based samples (see Naydenova, 2007; Poorman & Seelau, 2001; Willcoxson & Chatam, 2006). The self-assessment inventory measures the interpersonal characteristics of an individual through three interpersonal dimensions: Control, inclusion and affection. All three dimensions are measured through both expressed and wanted needs, creating a total of six interpersonal scales. The control dimension reflects the degree to which an individual asserts control over the actions of others (expressed), and the degree to which an individual wants their actions to be controlled by others (wanted). The inclusion dimension reflects the degree to which an individual involves other people into their activities (expressed), and the degree to which they want to be included in the in the activities of others (wanted). Finally, the affection dimension reflects the level of emotional attachment that individuals place onto others (expressed), and the level of emotional attachment that individuals desire from others (wanted) (see 8.3.2 for detailed description of FIRO-B assessment).

Although the FIRO-B was initially developed as a clinical tool, it has been widely adopted by many researchers to accurately predict a magnitude of interpersonal behaviours, such as loneliness (Jones, Freemon & Goswick, 1981), partner control (Naydenova, 2007), and even domestic abuse (Poorman & Seelau, 2001). Despite receiving some criticism for its supposed lack of construct validity (Mahoney & Stasson, 2005; Ryan, Maguire, & Ryan, 1970), many research studies have demonstrated the reliability of the FIRO-B scales in consistently measuring the six interpersonal characteristics (Gluck, 1983; Kramer, 1967; Poorman & Seelau, 2001). Furthermore, Kramer (1967) compared the scores from all six scales with a self-reported rating of each corresponding trait. Rank order correlations indicated that five out of the six scales were significantly correlated with the self-reported ratings (excluding expressed inclusion), supporting the construct validity of the FIRO-B assessment.

Previous research using the FIRO-B assessment have produced evidence suggesting a possible relationship between some of the scales and susceptibility to peer influence. The FIRO-B questionnaire was used by Huertas and Powell (1986) to successfully predict conforming behaviour within a different sample demographic. Using the inventory, the researchers examined the relationships between interpersonal characteristics and suggestibility, in teams of participants during a group task. The study's main aim was to examine the effects of a group leader on group conformity rates, with the experimental group having an allocated leader and the control group having no leaders. The results found significant positive correlations between conformity rates and the following interpersonal characteristics: expressed affection ($r=.28$), wanted affection ($r=.27$), expressed control ($r=.32$), and wanted control ($r=.25$). Although the findings offer some insight into the

interpersonal causes for suggestibility, many of the correlations observed may not be applicable to eyewitnesses. This is because the main aim of Heurtas and Powell's study was to identify the effects of conformity to group leaders, with each group having a group leader appointed. In addition, participants within the study were asked to report their answers in front of their team members. Therefore, the relationship between wanted affection and expressed control with conformity may have been caused by an individual's willingness to conform to the group to obtain the desired position of leadership (Huertas & Powell, 1986). During an eyewitness interview, there is no appointed leader and eyewitnesses would typically state their answers privately. Thus, in theory, the relationship between wanted affection and expressed control with conformity should be insignificant within such a context. However, there is not enough data within the previous literature to substantiate this inference. To gain a more reliable understanding of the interpersonal correlates of co-witness suggestibility, a more direct observation is needed. However, to date, no study has attempted to directly examine the relationship between these interpersonal characteristics and co-witness suggestibility. Based on the FIRO-B scale's wanted control dimension measuring an individual's need to have their actions and decisions controlled by others (Schutz, 1958), the present thesis contended that individuals scoring high on this dimension could be more vulnerable to co-witness influence.

4.4.4. Limitations of previous research

4.4.4.1. Interrogative suggestibility vs co-witness suggestibility

As mentioned previously, there is a severe lack of research investigating the relationship between personality traits and co-witness suggestibility. In lieu of this, researchers have had to rely on studies investigating the relationship between personality and interrogative suggestibility to gain a rudimentary understanding of the potential personality correlates of co-witness suggestibility. Although some comparative research suggests that the effects of interrogative suggestibility can be co-morbid with co-witness suggestibility (Jack et al., 2014; Thorley, 2013), there are still some sizeable differences between the two processes. Firstly, Paterson and Kemp (2006b) identified significant differences in the level of influence between misinformation that is presented through misleading questions and misinformation that is presented through co-witness discussions. Secondly, it can be inferred that misinformation acceptance can be facilitated by different processes depending on the source. Interviewers/investigators will carry a higher level of authority than participants/co-witnesses; as a result, many individuals who conform to interviewers will do so through an act of obedience to authority (Martin & Hewstone, 2003).

This could suggest that the personality correlates of interrogative suggestibility may be related to authority obedience and, thus, may not be predictive of an eyewitness's suggestibility to co-witnesses. The only way to identify accurate predictors of co-witness suggestibility is to observe this relationship directly, rather than relying on research which has been carried out on interrogative suggestibility.

4.4.4.2 Controlling for group size

The theoretical models of social influence suggest that the size of an information source can have a moderating effect on the level of influence exerted (Asch 1955; Bond, 2005; Latane, 1981; Thorley & Dewhurst, 2009; Vrij, Pannell, & Ost, 2005). Liebman et al. (2002) proposed that the relationship between personality differences and eyewitness suggestibility was heavily dependent on the experimental paradigm. Moreover, it can be suggested that some personality differences may only be able to predict co-witness suggestibility under certain circumstances (i.e. only when the misinformation is presented unanimously or by a large majority). However, despite evidence suggesting that misinformation size can have a mediating effect on co-witness suggestibility, very little research has attempted to control for this variable when attempting to identify the personality correlates of eyewitness suggestibility (See Doughty et al., 2017; Liebman et al., 2002). Therefore, the present thesis suggested that the relationship between personality differences and co-witness suggestibility should be repeatedly measured under different experimental conditions, to allow more accurate inferences to be made from the results.

4.5. Group size and co-witness suggestibility

The implications of co-witness influence have been discussed by many researchers and legal professionals, with numerous studies suggesting that the prevalence of co-witness influence contributes to a large proportion of false convictions every year (Gabbert et al., 2003; Mojtahedi, 2017; Skagerberg & Wright, 2008b). However, to gain a realistic understanding of the true risks of co-witness influence during real criminal incidents, research must first ensure that the process of a co-witness discussion is simulated and observed within an environment that boasts high ecological validity. The characteristics of a criminal incident will often vary depending on the type of crime and other situational

variables. Therefore, it is important to study the effects of co-witness influence within different situational settings, to allow researchers to determine the true prevalence of co-witness influence during real incidents.

4.5.1. Prevalence of pair studies within the existing literature

The majority of previous research on co-witness influence have typically studied the effects of post-event discussions on eyewitness pairs (or *dyads*, as referred to by previous research), where a participant would view and discuss a criminal event with either another participant who had viewed a different video (traditional memory conformity paradigm), or a misleading confederate, introduced as a fellow participant (traditional social contagion of memory paradigm) (e.g. Gabbert et al., 2003; French et al., 2008; Hope et al., 2008; Kieckhafer & Wright, 2014; Paterson et al., 2009; Roediger et al., 2001). Using the memory conformity paradigm, Gabbert et al., (2003) found that a significant proportion (71%) of witnesses reported seeing non-witnessed information that they had encountered during a post-event discussion with their co-witness. Similar effects have been observed by additional research on co-witness influence (see Paterson et al., 2009; Roediger et al., 2001), suggesting that the risks of misinformation acceptance during a co-witness discussion can be high. Additionally, research has found that misleading information presented by a single eyewitness can cause other co-witnesses to gain confidence in their erroneous judgements (Allwood et al., 2006; Paterson et al., 2009; Semmler et al., 2004), and can also cause non-conforming eyewitnesses to lose confidence in their judgements (Luus and Wells, 1994). This could be problematic for an investigation, as an eyewitness's confidence in their judgement can have an impact on their willingness to give evidence in court (Allwood et al., 2005; Luus & Wells, 1994; Semmler et al., 2004; Skagerberg & Wright, 2009).

However, these observations were made in studies that looked at the effects of co-witness discussions with only two co-witnesses present. During real criminal events, there will often be more than two eyewitnesses present (Memon, Dalton, Horry, Milne, & Wright, 2016; Paterson & Kemp, 2006a; Skagerberg & Wright, 2008b). A survey by Paterson and Kemp (2006a) calculated the mean number of eyewitnesses present during a witnessed criminal incident to be 6.77. Additionally, the survey found that 86% of eyewitnesses would choose to engage in a discussion with their co-witnesses. After combining the two statistics (M number of co-witnesses \times percentage of witnesses who engage in group discussions), the figures loosely suggest that on average, 5.82 co-witnesses would engage in a group

discussion with their co-witnesses. Additionally, a review on over 175 cases of eyewitness misidentification within the US by The Innocence Project identified that in 38% of the cases of misidentification there were multiple eyewitnesses misidentifying the same innocent individual as the offender (Cardozo, 2009). Two inferences can be made from this observed statistic: the first is that the misinformation of one witness may have influenced other co-witnesses into misidentifying the wrong individual. The second suggests that during a co-witness discussion, it is not uncommon for an eyewitness to encounter misleading information from multiple co-witnesses.

However, despite these figures suggesting that co-witness discussions will most often involve larger groups, and that misinformation can be presented by multiple sources, the majority of research has only observed the effects of co-witness influence on pairs, with very little research attempting to observe these effects within larger groups. Failure to study co-witness influence in larger and more realistic group sizes could result in inaccurate inferences being made about the behaviour of real eyewitnesses. Moreover, the generalized findings could cause researchers to produce unrealistic estimations about the prevalence of co-witness influence within real investigations. This is because traditional theories on social influence suggest that the size of an eyewitness group could have a mediating effect on the risks of co-witness influence. In particular, Bond (2005) highlighted the significance of the unanimity of misinformation, target group size and misinformation size in moderating the level of social influence an individual will be subjected to.

4.5.2. Misinformation size

The risk of informational influence has been shown to be positively correlated with the size of the information source (Bond, 2005). Early research on social conformity demonstrated that social influence was significantly greater when participants were exposed to misinformation from three sources than from one (Asch, 1955; Gerard et al., 1968; Rosenberg, 1961; Stang, 1976). Later research suggested that the level of social influence would continue to increase when more than three sources of information were present (Gerard et al., 1968; Latané & Wolf, 1981; Nordholm, 1975; Stang, 1976). However, such studies were based on simplistic tasks (i.e. line judgement; see Asch, 1955), where the task difficulty was very low and the level of informational influence would have consequently been lower (Festinger, 1954). When considering the giving an accurate eyewitness statement, the task at hand is arguably more difficult and ambiguous than the majority of judgement tasks incorporated by the majority of conformity studies (e.g. line judgement).

Line judgement tasks solely rely on an individual's ability to measure shapes, whereas the task of giving an eyewitness statement requires the individual to reconstruct and interpret memories which may have been distorted through various factors such as memory decay (Tuckey & Brewer, 2003), poor visibility (Kebbell & Wagstaff, 1999) and induced stress (Deffenbacher et al., 2004). Therefore, findings from more direct observations must be sought to gain an accurate understanding of the relationship between misinformation size and co-witness influence.

Despite the scarcity of literature on group size and co-witness influence, the relationship between the two variables has been investigated by some researchers. Foster, Huthwaite, Yesberg, Garry, and Loftus (2012) compared the effects of co-witness influence memory recollection within different conditions. Participants either encountered the misinformation from one co-witness or from three co-witnesses. Although the results found that exposure to co-witness misinformation had an influencing effect on the participant's memory reports, the study found no significant differences in memory conformity rates between either of the experimental conditions. The findings suggest that the inclusion of the first misinformation source would have had the greatest effect of social influence and any additional members would have had no significant effect on the participants. However, the study did not use live co-witnesses; instead, participants were presented with the statements of previous participants. As a result, the participants may have assumed that the misleading statement of one witness was correct, due to the fact that it was presented to them by the interviewer, and, thus, any additional co-witness statements would not have had an increasing effect. Consequently, it can be inferred that the findings would not offer an accurate representation of the relationship between misinformation size and co-witness influence during a co-witness discussion. Walther et al. (2002) investigated the relationship between group size (five versus ten) and memory conformity on eyewitness statements, using live confederates. Participants witnessed an incident and later discussed the event with a group of other co-witnesses. Participants were either subjected to co-witness misinformation from a group of five co-witnesses or ten co-witnesses (using confederates). The results suggested that misinformation was more influential when presented by the larger groups (ten). However, this difference was only observed when the task difficulty was low. When the task difficulty was increased (consequently increasing uncertainty), both group sizes had the same level of influence on the participants' responses. This is because an increase in task difficulty would have made the target more vulnerable to informational influence (Baron et al., 1996) and, as a result, fewer individuals would have been required to convince the targeted individual to conform to their judgement. The findings of Walter et al. (2002) also indicate that the relationship between misinformation size and co-witness influence is dependent on the task at hand. Moreover, the study suggests that the more

difficult a task is, the fewer sources will be required to facilitate co-witness conformity. Unfortunately, the research of Walther et al. (2002) is one of the very few studies to measure the effects of memory conformity as a function of group size. Walther and colleagues were able to accurately identify the differences in co-witness influence between groups of five and ten co-witnesses. However, research suggests that within real criminal incidents it is relatively rare for ten co-witnesses to engage in a co-witness discussion; the number is often much smaller (Paterson & Kemp, 2006a). Therefore, the present study was more interested in comparing the levels of co-witness influence between groups of two (as typically measured within the majority of memory conformity studies) to six (rounded average eyewitness group size; Paterson & Kemp, 2006a) eyewitnesses. To date, no such research has attempted to make this observation.

Multiple psychological theories have been presented to explain the relationship between misinformation size and group influence. Asch (1955) suggested that an increase in misinformation size would mean that targets would be less likely to perceive the misinformation as being an idiosyncratic judgement, and would therefore be more likely to accept it as being correct information about reality through informational influence. Mullen's (1983) theory on self-attention and conformity can also be used to explain the relationship between misinformation size and group influence, in relation to normative and informational pressure. Self-attention theory is concerned with self-regulation processes that control the direction of an individual's behaviour. When there is high self-focus, self-attention evokes a matching to standard process, where individuals will interpret the behaviour of the majority as the norm and attempt to conform to it (Carver & Scheier, 1981); thus, larger groups will have more influence on individuals through eliciting a greater level of self-focus onto the target.

An increase in group size can also influence an individual through increased memory distortions. The retrieval-strategy disruption (RTD) hypothesis (Basden & Basden, 1995; Basden et al., 1997; Dahlström et al., 2010) suggests that exposure to conflicting information during memory recall can disrupt an individual's memory retrieval process and consequently result in poorer memory recall. With inter-group conflict being more prevalent in larger groups (Carral et al., 2010), it may be the case that eyewitnesses in larger groups could face greater uncertainty when recalling the event - which may consequently increase their vulnerability to co-witness influence (Walther et al., 2002). The effects of RTD were demonstrated by Thorley and Dewhurst (2009). Participants were placed into different sized groups (1, 2, 3 or 4) and asked to memorise a series of words. They were later asked to work as in their teams to recall as many items as they could remember. The results indicated that the error rates in collaborative memory recall were higher and more similar

within groups of four participants, relative to individual or two-person groups. The researchers explained that the participants within the four-person groups would have been likely to encounter conflicting information from the other participants more frequently. The constant exposure to conflicting information during memory retrieval would have impeded their abilities to retrieve as much information accurately. As a result, they will have been less likely to remember as many words and, consequently, more susceptible to mistaking the erroneous judgements of their group as being correct.

Up to now, the present chapter has neglected the relationship that misinformation size could have with another cause of memory conformity, source monitoring errors. Theories on source monitoring suggest that eyewitnesses could also incorporate their co-witness's misinformation into their memory reports unintentionally, by misattributing the post-event information as witnessed information due to memory errors (Cann & Katz, 2005; Schacter et al., 2011; Tousignant et al., 1986). Individuals who report their co-witness's misinformation through source monitoring errors will not be aware of their errors. As a result, the observed effects of misinformation size on informational influence should have little impact on an eyewitness's susceptibility to making source monitoring errors. However, the present study presents multiple theories which suggest that misinformation size can also increase an individual's risk of misattributing post-event information as witnessed information. Firstly, research suggests that for an individual to misattribute post-event information as witnessed information they must first accept it as being valid; if the information is immediately perceived as being incorrect, the individual will be unlikely to misattribute it as witnessed information (Tousignant et al., 1986). Individuals are more likely to accept newly learnt information as being correct if it is presented by a larger group of individuals (Fiedler, 2000; Hertwig et al., 1997); therefore, an individual's risk of misattributing co-witness information as witnessed information would be higher if the information is presented by multiple individuals. Additionally, it can be argued that repeat exposure to the same misinformation would have an increasing effect on the probability of the misinformation being misattributed as witnessed information. However, the effect size of the relationship between misinformation size and source monitoring errors may be significantly weaker than the effect size of the relationship between misinformation size and social influence, due to the significantly greater amount of research supporting the latter relationship.

4.5.2.1. Using models of social influence to predict the relationship between misinformation size and co-witness influence.

Although previous studies have been able to demonstrate that co-witness influence is moderated by the misinformation size, a question that remains unanswered by the existing literature is whether this relationship is linear or not. In other words, does the addition of each new co-witness provide the same level of increase in co-witness influence or does the level of co-witness influence plateau after a certain misinformation size has been reached (suggesting that an 'optimum misinformation size' may exist)? Further, if the relationship is not straightforward and linear, it would be of interest for researchers to determine which additional information source would provide the biggest increase in co-witness influence (i.e. would the addition of the second misinformation source provide the biggest increase in co-witness influence, relative to the third and fourth etc.?). By identifying the nature of the relationship between majority size and co-witness influence, practitioners within the criminal justice system may be able to determine the risks of co-witness contamination within an investigation more accurately. Although research has identified that such a relationship would be heavily dependent on the task at hand (Baron et al., 1996), a review of the existing models of social influence and conformity can still provide some insight on the potential relationship between misinformation size and co-witness influence.

When looking at the general models of social psychology, the relationship between misinformation size and conformity is a subject which has generated varying opinions within the literature. In his meta-analysis of the existing literature on conformity, Bond (2005) indicated that previous research has identified two main trends: Asch (1955) produced data which suggested that the relationship between majority size and group pressure was nonlinear - the results showed that conformity rates were highest when there was a majority size of three and that any additional confederates would not cause a significant increase to the conformity rate. An alternative relationship, also supported by previous research, argues that the relationship between the two variables is linear. Latané (1981) argued that conformity rates would continue to increase after the majority size exceeded three individuals. However, the theory did state that the rate of increase in conformity rates - per extra individual - would decelerate as the group size increased.

Many studies have attempted to identify the exact form of relationship between the two variables, and the results have varied. Asch (1951, 1955), Reitan (1969), and Rosenberg (1961) produced data in support of the nonlinear relationship, whereas other studies have produced strong evidence in favour of the linear relationship (Gerard et al.,

1968; Nordholm, 1975; Stang, 1976). Alternatively, there is evidence to indicate that there is no difference in conformity rates once the majority size exceeds more than two group members (Goldberg, 1954; Kidd, 1956). With regards to an 'optimum majority size', previous studies have produced evidence suggesting that the optimum majority size for social influence to be at its highest can range from two (Reitan, 1969) to ten (Kumar, 1983). Contradictions in the literature are as to be expected when dealing with the process of conformity. This is because the social pressures exerted on an individual from a majority are highly dependent on numerous external factors, such as the task at hand, the type of influence that predominates (normative or informational), and the characteristics of the majority group members. Due to the varying studies incorporating different methodological designs, different research studies produce different results. Campbell and Fairey (1989) proposed that the relationship between social conformity and group size was dependent on what type of influence predominated. They stated that when the influence was predominantly normative (pressure to conform for group acceptance), it would entail a sigmoid shaped (non-linear) relationship between group size and social conformity, as proposed by Asch's theory on social conformity (1952). If the influence was predominantly informational, they argue that it would entail a more linear shaped relationship between group size and social conformity as proposed by Mullen (1983).

With regards to co-witness conformity after a post-event discussion, the influence would be predominately informational due to eyewitnesses giving their responses privately (Goodwin et al., 2012). In such cases, research studies investigating the relationship between majority size and conformity have found that the relationship can be explained by two different psychological models; Social Impact Theory (SIT; Latané, 1981) and Self-Attention Theory (Mullen, 1983).

Social Impact theory (SIT) fixates on the psychological changes caused to a person by the presence of other individuals (Latané, 1981). The theory states that there are three main dimensions of a group that determine the amount of social impact given off: group strength (status), immediacy and size. SIT also takes into account the effects of the target group size (number of individuals who are subjected to the group pressure). The theory was not developed specifically to explain social conformity but instead, it is used to explain the relationship between group size and social impact. Latané (1981) used the term 'social impact' to describe various social pressures exerted on individuals by groups, including the pressure to conform to the group. Thus, SIT can be used as a generalised representation of how group size interacts with social influence. The theory uses the psychological law of $I = sN^t$ ($t < 1$), where I is the amount of social impact, t will equal a power less than one, N is the number of sources in the group, and s represents a scaling constant. Latané (1981)

produced this law to represent the relationship between group size and social impact. The law states that the addition of an individual has less of an effect on the target as the number of individual's increase.

Mullen (1983) used self-attention theory to explain how the size of groups can have an impact on an individual's tendencies to conform. Self-attention theory is a self-regulation process that controls the direction of an individual's behaviour. When there is high self-focus, self-attention evokes a matching to standard process where individuals will interpret the behaviour of the majority as the norm and attempt to conform to it (Carver & Scheier, 1981). The theory was derived from Koffka's (1935) 'figure-ground principle', where the figure is likely to become self-attentive and more likely to conform to the ground. The theory used a formula for measuring the relationship between group size and conformity known as the Other-Total Ratio (OTR). OTR uses the formula $O/(O+S)$, with O representing the number of people in the majority group and S representing the number of individuals in the target group.

Both models share a key similarity in that they identify the relationship between group pressure and majority size as being asymptotic, with each additional majority group member having less of an impact on the overall group pressure. To understand this relationship, we must inspect the concept of informational influence. Informational influence is the process of accepting a group's view as accurate information about reality; an individual who conforms through information influence does so because they believe that the information source is correct (Kaplan & Miller, 1987). The inclusion of the first information source would be deemed as the most effective as it presents the target with new information which they may or may not choose to accept as being correct. An increase in the number of information sources would not offer any further information for the target to process its validity, instead it will only strengthen the perceived reliability of the information (Bond, 2005). Therefore, the actual content of the information presented by the information source will have more of an influence on the target than the size of the group presenting the information. The proposed relationship between majority size and conformity is supported by numerous research studies that have attempted to observe this relationship. Mullen (1983) cross-analysed 11 studies on group conformity and identified that OTR was able to significantly predict conformity rates in the majority of the studies ($p < .00001$). Adding further support, an experimental study adopting Asch's line paradigm measured conformity rates to majority groups of one to seven group members. The study found that the first and second group members had the greatest impact on conformity rates, as predicted by SIT and self-attention theory (Gerard et al., 1968). Both self-attention theory and SIT would suggest that in an eyewitness setting each additional

misleading co-witness would have less of an impact on the overall level of co-witness influence. In relation to co-witness influence; Foster et al., (2012) found no differences in the rate of co-witness conformity between participants who encountered misinformation from one co-witnesses and participants who encountered misinformation from three co-witnesses, supporting both models' proposed relationship between misinformation size and co-witness influence. However, due to the study only comparing two different misinformation sizes (1 and 3), more research is needed to gain a reliable understanding of this relationship.

As mentioned previously; both of the above models were based on the psychological constructs of social influence and, thus, the predicted relationships may not be applicable to the process of memory conformity. The models do not take into account the fact that some eyewitnesses may incorporate their co-witness's misinformation through non-social pressures (source monitoring errors). Additionally, individuals who witness a crime will be affected by additional moderating factors which can have an effect on their behaviour and susceptibility to co-witness influence (i.e. induced stress and pressure to perform). Therefore, whilst the models of social influence offer interesting predictions on the relationship between misinformation size and co-witness influence, more direct observations on eyewitnesses are needed for researchers to accurately determine the true relationship between these two variables.

4.5.3. Unanimity of misinformation

Theories on informational influence suggest that for misinformation to have a significant influence on the target it must also be unanimously held by the group (Asch, 1955; Baron, et al., 1996). If not, the presence of a dissenter will break the chain of consensus and consequently reduce the level of influence the majority group will have on the target (Allen & Levine, 1968; Asch, 1951; Hardy, 1957; Malof & Lott, 1962; Morris & Miller, 1975). To demonstrate the importance of unanimity for group influence, Asch (1951; 1952) conducted a series of line perception tasks on participants. When an individual participant was placed in a group of confederates (unanimous misinformation), approximately 33% of the participants conformed. However, when there was only one confederate against a group of participants (eliminating the presence of a unanimous group), the study found that none of the participants would conform to the confederate.

In a study more relevant to the present work, Walther et al. (2002) were able to demonstrate this effect amongst co-witnesses. As well as measuring the effects of

misinformation size, the study also measured the effects that a dissenter would have on the majority group's influence. Participants were either exposed to misinformation from a group of co-witnesses with no dissenters present (unanimous majority), or they were exposed to misinformation from a majority group with a dissenter (someone who disagreed with the majority) present. The study found that misinformation presented by a majority group was significantly less influential on eyewitnesses when there were additional dissenters present. Mori and Mori (2008) produced similar findings: using the MORI technique (explained in Chapter 3), the researchers examined the effects of co-witness influence in one-versus-two situations - where a participant would discuss the event with two misleading co-witnesses, and in two-versus-two situations - where a participant would discuss the event with two misleading co-witnesses and one supporting co-witness. The study found that participants in the one-versus-two conditions were more likely to conform to the majority, whereas the participants in the two-versus-two conditions were more likely to stick to their own judgements. Both studies indicate that the presence of a dissenter would significantly reduce the risks of co-witness influence. This is because for informational influence to be effective, the target must believe that the information source is more likely to be correct than them (French et al., 2011; Williamson et al., 2013). Walther and colleagues (2012) suggested that a dissenter would provide the individual with an independent view of the event, which could resultantly increase the individual's own confidence in their recollection and reduce their susceptibility to informational influence. Additionally, research suggests that individuals favour supporting information from group members over contradicting information (Jonas et al., 2001). Therefore, it can be suggested that exposure to confirmatory information from an individual source may have more influence on an eyewitness than exposure to contradicting information from multiple sources (as demonstrated by Mori & Mori, 2008). The relationship between unanimity and group influence can also be explained by the frequency-validity principle, which submits that the consistent repetition of a statement can increase its perceived validity (Fiedler, 2000; Hertwig, Gigerenzer & Hoffrage, 1997). In relation to co-witness influence, the theory would suggest that eyewitnesses would be more likely to accept post-event information from a co-witness, if the information was consistently suggested by all group members. In contrast, a break in the unanimity of the misinformation would evoke an increase in doubt over the reliability of the misinformation (Festinger, 1945), which could resultantly encourage the target to reject it.

4.6. Co-witness familiarity

Despite the previous literature concordantly stating that co-witness discussions can influence individual statements, most of these studies incorporated experimental designs where the participants were strangers to one another (e.g. Gabbert et al., 2003; Gabbert et al., 2004; Meade & Roediger, 2002). This is primarily due to the vast majority of eyewitness researchers incorporating an opportunity sampling approach within their own affiliated institutions, due to the on-demand availability of student participants (Loftus et al., 1992). Other studies have failed to control for the variable as a whole, with investigators failing to ask the participants if they had any pre-existing relationships with the fellow participants. Although the utilisation of heterogeneous groups can allow for a much easier sampling process (opportunity sampling), the ecological validity of such designs may be suspect due to the recurrent tendency for real eyewitnesses to have pre-existing relationships. A recent survey found that 77% of eyewitnesses are likely to have a previous acquaintance with their co-witnesses (Paterson, Chapman, and Kemp, 2007).

As mentioned previously, research suggests that co-witness influence is highly dependent on the source from which the information comes from (Hope et al., 2008; Kwong See et al., 2001; Smith & Ellsworth, 1987; Lampinen & Smith, 1995). Moreover, two research studies have suggested that eyewitnesses are more likely to conform to the memory reports of co-witnesses that they share a pre-existing relationship with, relative to unfamiliar co-witnesses (French et al., 2008; Hope et al., 2008). French et al. (2008) attempted to identify if a pre-existing relationship between co-witnesses would facilitate an increase in memory conformity, by comparing the similarity in memory reports between romantic partners and strangers. Using the MORI technique (see Chapter 3), the researchers presented pairs of participants with slightly altered versions of an event. The pairs were then asked to discuss certain parts of the events with each other (i.e. 'what colour was the car?')-unbeknown to them, the pairs would have had contradicting recollections of the event. Later, participants were given a questionnaire concerning their memory of their movie (memory recall task). The questionnaire was used to determine whether participants would report seeing items from their respective videos, or instead report seeing unseen items that were suggested to them by their co-witness. The results indicated that the participants who had discussed the footage with a romantic partner were significantly more likely to report false memories (unwitnessed items) than participants who had discussed the footage with a stranger. The findings suggest that the risks of memory conformity amongst eyewitnesses would be greater if the witnesses are in a romantic relationship. Hope et al. (2008) provided further insight on the relationship between co-

witness familiarity and memory conformity, by also looking at the effects of co-witness discussions between friends on memory recall. Participants were placed in pairs and shown slightly different videos to one another using two separate monitors and a screen to prevent them from seeing their partner's monitor. Participants were either paired with a stranger, a romantic partner, or a friend. A similar procedure to French et al. (2008) was administered, whereby the pairs would discuss the footage and, later, provide a memory recall report through answering a questionnaire. Similarly, to French et al. (2008), the study found that participants were more likely to incorporate false memories from their friends and romantic partners, than from a stranger. Additionally, the study found no significant difference in statement similarity between friends and romantic partners, suggesting that the type of pre-existing relationship did not have an effect on memory conformity. Although the aforementioned studies were based on general memory recall tasks rather than specific blame attribution tasks, they highlight the significance of pre-existing relationships in mediating co-witness influence. More importantly, the studies emphasise the importance of controlling for pre-existing relationships when attempting to reliably investigate the effects of co-witness discussions. Based on the observed relationship between co-witness familiarity and memory conformity rates, the present study argues that the vast majority of previous research which has failed to control for the variable of participant familiarity will have produced results which would not be representative of real eyewitnesses.

Multiple explanations can be used to explain the relationship between co-witness familiarity and memory conformity. The relationship could be due to eyewitnesses having an increased level of trust towards familiar co-witnesses. Many relationships are built upon, and maintained through, a shared reality, where individuals will be more inclined to trust and agree with each other (Echterhoff et al., 2005; Sorrentino & Yamaguchi, 2008). Consequently, eyewitnesses may be more likely to accept information from such acquaintances as a result of a habitual interaction. Research on deception detection suggests that people are more likely to question the integrity of a statement from an individual that they share less of an emotional connection with (Anderson, DePaulo, & Ansfield, 2002). McCornack and Parks (1986) attributed this to individuals developing a truth bias towards people that they share a relationship with. The term 'truth bias' refers to naivety of an individual in presuming that a specific speaker is telling the truth (Bond & DePaulo, 2006; Levine, Park & McCornack, 1999; Vrij, 2008; Street & Masip, 2015). Consequently, the presence of an inherent truth bias would suggest that eyewitnesses would be more likely to accept misinformation about an event from familiar co-witnesses than by those unfamiliar to them.

Additionally, research has shown that eyewitnesses are more likely to accept contradicting information from a co-witness that they share a pre-existing relationship with, than from a stranger (Hope et al., 2008). This is because when an eyewitness is exposed to contradicting information from a stranger, the individual will have limited mental schemas to help assess the validity of the co-witness, and will therefore be more inclined to disregard their information; whereas when exposed to information from a familiar co-witness, the individual can use their pre-existing knowledge about the co-witness to gauge the reliability of their judgement (Festinger, 1954; Forgas & Williams, 2001; Gabbert et al., 2007; Kieckhaefer and Wright, 2014). In contrast, if the individual perceives a familiar co-witness as being incompetent or untrustworthy, this could motivate them to disregard their co-witness's report (Claes & Poirer, 1992; Skagerberg & Wright, 2009).

The degree to which an individual identifies with another person can also have an effect on how likely they are to conform to them (Walker & Heyns, 1962). This can be accredited to a heightened level of likeability; research on social cognition suggests that the likeability of an information source can affect their level of influence (Burger et al., 2001; Chaiken, Liberman, & Eagly, 1989; Cialdini, 2001; Frenzen & Davis, 1990). Hope et al. (2008) explained that eyewitnesses are likely to spend less time evaluating the reliability of a co-witness's judgement if they find the individual more likeable (unless the individual is deemed as being extraordinarily inaccurate in life). As a result, eyewitnesses could be more inclined to conform to acquaintances than strangers, as a result of a higher level of likeability towards them. However, the literature contains conflicting evidence with regards to this. Kieckhaefer and Wright (2014) found that strangers were more likely to conform to confederates that they disliked than to confederates that they deemed likable. This was attributed to a reduced risk of negative evaluation from confederates that were deemed as being more likable as a result of disagreement (Wright et al., 2010). It must be noted, however, that the participants from Kieckhaefer and Wright (2014) were asked to give their answers in the presence of their confederates, whereas during an eyewitness interview, the witnesses would give their statements privately. Therefore, the witness's statement would bear no social repercussions and, thus, the level of normative influence would be significantly reduced.

It is also worth considering that individuals with pre-existing relationships often develop a transactive memory system which allows for the sharing of knowledge, based on each person's area of advanced knowledge (Wegner, 1986; Wegner, Erber, & Raymond, 1991). Wegner (1995) stated that individuals with pre-existing relationships will form an understanding of each person's domain of expertise. As a result, groups of eyewitnesses will

be more likely to unanimously determine which co-witness is most likely to be correct, which could motivate the group members to conform to the same co-witness.

Much like the majority of previous research on co-witness influence (e.g. French et al., 2008; Hope et al., 2008; Kieckhaefer & Wright, 2014), the two aforementioned studies on co-witness familiarity only observed the effects of co-witness influence on pairs. However, during most crimes there are often more than two eyewitnesses present (Memon et al., 2012; Paterson & Kemp, 2006; Skagerberg & Wright, 2008b), with one survey suggesting that, on average, there are over six co-witnesses present during an incident (Paterson & Kemp, 2006a). As mentioned previously, the level of co-witness influence exerted onto an individual is heavily dependent on the number of co-witnesses presenting the misinformation (Blank, 2009). This was supported by Walther and colleagues, who investigated the relationship between group size (five versus ten) and memory conformity and found that, when the memory recall task was relatively easy, co-witness misinformation was more influential when it was presented by the larger groups (Walther et al., 2002). On this basis, the present thesis postulated that there was a need for new research to investigate the effects of co-witness familiarity on blame conformity within larger eyewitness groups. However, to date, the effects of blame conformity have only been studied on eyewitness pairs.

4.7. Co-witness characteristics

So far, the literature discussed has investigated how eyewitnesses can differ from one-another in their susceptibility to co-witness influence. These differences were attributed to both individual differences (internal factors), which could make an individual more vulnerable to being influenced (age, gender and personality), as well as environmental differences (external factors) that could make the source of the misinformation more influential (group size and familiarity). Research suggests that co-witness influence is highly dependent on the source from which the information comes from (Hope et al., 2008; Kwong See, Hoffman, & Wood, 2001; Lampinen & Smith, 1995; Smith & Ellsworth, 1987). Thus, it is important to also consider whether the perceived characteristics of an eyewitness could increase their level of influence on other co-witnesses.

Research indicates that the social characteristics of an information source have an effect on how influential they are on co-witnesses (Betz et al., 1996; Forgas & Williams, 2001). More specifically, it is the way in which the information source is perceived by their co-witnesses that affects their level of informational influence (Echterhoff et al., 2005;

Skagberg & Wright, 2009; Williamson et al., 2013). Blank (2009) argued that informational influence heavily revolved around the credibility of the information source. This is supported through previous research; Dodd and Bradshaw (1980) found that participants would use the occupation of an individual to determine whether their information was reliable. For example, the study found that participants were less likely to accept information from defence lawyers, as they deemed them as being less truthful.

Research has suggested that eyewitnesses are more likely to be influenced by co-witnesses that they have a pre-existing relationship with rather than by strangers (French et al., 2008; Hope et al., 2008; Skagerberg & Wright, 2008). This is mainly attributed to differences in the level of informational influence, such that individuals who have pre-existing relationships with their co-witnesses can draw on their existing knowledge of that person to produce a better assessment on their probability of being correct (Bless et al., 2001; Festinger, 1954; Gabbert et al., 2007). As a result, an eyewitness would be more likely to believe that their co-witness was correct, if there was pre-existing information to support their abilities. When faced with a co-witness who the individual has no pre-existing knowledge of, it is harder to produce an accurate assessment of their probability of being correct and therefore, they would be less inclined to accept information from them. However, there is evidence suggesting that not only can eyewitnesses make an attempt to assess the validity of an unknown co-witness, but that they can also act on these assessments and conform to the co-witness (Kwong See et al., 2001; Thorley, 2015).

A large body of research on co-witness influence used experimental designs where the participants were strangers to each other and much of these studies demonstrated that participants would still conform to their unfamiliar co-witnesses (see Gabbert et al., 2003; Gabbert et al., 2004; Meade & Roediger, 2002; Thorley, 2015). It has been suggested that when an individual encounters misinformation from an unfamiliar individual, they will often use schema-guided information about the stranger to make stereotypical assumptions of them (Carver & Garza, 1984). Individuals automatically activate stereotypes when they confront strangers (Devine, 1989); the present thesis argues that eyewitnesses use any available social cues from a co-witness to form a stereotypical judgement of their abilities to recall information accurately. The current chapter proposes that this estimation may be the primary cause for co-witness conformity amongst strangers.

4.7.1. Perceived competence

Studies show that young eyewitnesses are less likely to conform to unknown elderly co-witnesses, due to stereotyping them as having a poorer memory retrieval system relative to their own (Kwong See et al., 2001; Thorley, 2015). Thorley (2015) found that participants were susceptible to conforming to their co-witness's false blame attribution, after reading their erroneous statement, but only when the unfamiliar co-witness was a young adult. The study found that when the co-witness was an elderly woman, participants were significantly more likely to reject her statement. Additionally, Thorley (2015) found that participants were more likely to conform to co-witnesses that were perceived as having better memory over co-witnesses that they deemed as being more reliable. This suggests that eyewitnesses will be more concerned with the competence of their co-witness rather than their reliability, when deliberating on whether or not to accept their information. Such studies suggest that eyewitnesses use negative stereotypes to assess the competence of their co-witnesses. Positive stereotyping can also be used by eyewitnesses when conforming to misinformation; research shows that the voice of an information source can have an effect on how influential they are to others through positive stereotyping between the voice of an individual and their predicted level competence (Vornik, Sharman, & Garry, 2013). Campbell-Kibler (2009) indicated that individuals will often use sociolinguistic cues to gauge the intelligence of others, indicating that as well as the characteristics of an information source (such as occupation), their behaviour can also be assessed by co-witnesses, who may then act on these assessments and conform to them.

The concept of competence is multi-faceted, in that, a variety of different items can be used to demonstrate and manipulate the trait of perceived competence (Fouad et al., 2009). This is because the term merely reflects an individual's ability to complete a task successfully or efficiently, thus, the indicators of competency will be dependent on the task at hand. Interestingly, research suggests that people are likely to associate those that are more competent than them as having exceptionally high intelligence (Alicke, LoSchiavo, Zerbst, & Zhang, 1997). Based on this, it can be suggested that an individual's intelligence could be used as a more generalisable indicator of competence. In relation to intelligence and eyewitness competence, Brigham and Wolfskeil (1983) found that individuals were likely to use the perceived intelligence of an eyewitness as an indicator of their competence in presenting an accurate memory report.

4.7.2. Perceived status and authority

The effect of authority on co-witness influence is also a prominent area of focus within the literature, with various studies attempting to identify the effect an individual's perceived status has on their level of influence. This stems from the earlier work of Milgram (1963) on obedience to authority, where participants were significantly more likely to adhere to the instructions of someone of higher status. In relation to misinformation acceptance; Vornick, Sharman, and Garry (2003) found that participants were significantly more likely to be misled by speakers that they scored as having a more powerful and authoritative voice

The effects of police officers as misinformation sources have been used as a means of measuring the effect of authority and credibility on co-witness influence (e.g. Skagerberg & Wright; 2009; Stanny & Johnson, 2000; Williamson et al., 2013); this is primarily due to the majority of the general public perceiving police officers as having a significantly high level of authority and credibility (Jackson, Bradford, Hough, Myhill, Quintin, & Tyler, 2012). The majority of the studies agree that eyewitnesses are significantly more likely to be misled by misinformation from a police officer than from an individual with a non-authoritative occupation (such as a student, Skagerberg & Wright, 2009; or an electrician, Williamson et al., 2013) when providing a statement. The underlying cause for this 'authoritarian' effect, however, can be disputed. From one perspective, people are more likely to perceive a police officer as being a more credible eyewitness than someone who is not an officer (Garrido, Masip, & Herrero, 2004), and such perceptions of credibility have previously been associated with an increase in social influence (Echterhoff et al., 2005; Hoffman et al., 2001; Kwong See et al., 2001; Smith and Ellsworth, 1987). Additionally, many individuals will be more likely to comply with an individual of higher authority (Bushman, 1984) and, thus, the relationship between the role of the co-witness and their co-witness influence can also be attributed to the normative pressures that are heightened as a result of their authority. On the other hand, Williamson et al. (2013) found that despite police officers being rated as more credible eyewitnesses than non-officers (electricians), there was no significant relationship between credibility of the misinformation source and co-witness conformity during memory recall. Instead, the study found that participants were more likely to conform to police officer confederates, due to perceiving them as having a better memory than their own. Therefore, it can be suggested that participants are more inclined to fixate on their co-witness's cognitive abilities in memory retrieval rather than their status when attempting to validate their judgement. Similar studies lend further support to this theory; Skagerberg and Wright (2009) found that during a memory recall

task, eyewitnesses were significantly more likely to be influenced by police officers in comparison to children. When discussing their findings, the authors explained that the eyewitnesses were only affected by feedback from co-witnesses that they deemed to be more likely to be correct than themselves. A limitation of the study was the comparison between police officers and children as independent variables: due to a vast proportion of differences in social characteristics between the two sources of co-witnesses, there may have been additional confounding variables influencing the participants' decisions.

4.7.3. Informational and Normative pressures

The relationship between the perceived competence of an eyewitness and their level of influence on other co-witnesses can be attributed to the fundamental constructs of informational influence - one of the primary causes of co-witness influence. It has been repeatedly mentioned within the present thesis that for informational influence to be effective the targeted individual would have to believe that the information source is more likely to be correct than them (French et al., 2011; Williamson et al., 2013). This would explain why eyewitnesses would be more likely to be influenced to co-witnesses deemed competent. Essentially, if an eyewitness perceives their co-witness as being highly likely to be correct, they would be more inclined to accept their information, even if it contradicts with their own memory report.

Another process which can facilitate memory conformity is normative influence, a process where the individual will be motivated to conform as means for gaining approval and avoiding negative evaluation from other people (Wright et al., 2010). Gilbert (1993) proposed that individuals were more likely to be submissive to those that they perceived as having a higher status than them. In relation to co-witnesses, it can be deduced that if an eyewitness would be likely to perceive co-witnesses with higher levels of authority and competence as having a higher status/social rank to them, the eyewitnesses would be more likely to be socially submissive to their arguments. Additionally, research has suggested that individuals will exhibit a greater fear of negative evaluation if they perceive themselves as being less competent or of a lower social rank than others (Ridgers, Fazey, & Fairclough, 2007; Weeks et al., 2005). Therefore, it can be suggested that when an eyewitness encounters misinformation from a co-witness who they deem as being more competent or of a higher status/authority than them, they will exhibit a greater fear of negative evaluation. Consequently, they will be more susceptible to normative influence. However, if police investigators are trained to collect statements privately, a witness's statement would

bear far less social repercussions and, therefore, the level of normative influence would be significantly reduced.

When discussing the effects of perceived competence and authority on co-witness influence, it is important to note that the relationship between these variables and co-witness influence is relative to the targeted individual's perceptions of their own level of competence and status. In other words; for a co-witness's competence or authority to have a mediating effect on their level of influence, the targeted individual would have to perceive them as being more authoritative or competent than themselves. Therefore, an eyewitness may be more influential on one co-witness than on another. Based on the effects of competence and authority being dependent on the targeted individual's perception of their self, it can be argued that these variables can be classified as both internal and external factors.

Chapter 5: Introduction to the Experimental Chapters

The present chapter introduces the empirical work that was carried out within the thesis. The chapter will outline the main aim of the research, and will discuss the general methodological considerations that were adopted within the experiments. The ethical considerations are also discussed.

5.1. The empirical studies

The main aim of present research was to investigate the effects of co-witness influence on eyewitness blame attribution (a process that requires individuals to recall and interpret central details to an incident). More specifically, the project attempted to identify the external and internal predictors of co-witness suggestibility in relation to blame conformity and eyewitness confidence (the two measures used throughout the research to measure co-witness suggestibility). To fulfil these aims, the thesis comprised of four studies, each with a sub-selection of aims and hypotheses (discussed in their respective empirical chapters) which were formulated to help identify accurate predictors of co-witness suggestibility.

5.1.1. Study 1a: Gender & age effects on co-witness suggestibility

Participants ($N=608$) viewed and discussed crime footage with co-witnesses (participants in the control condition were not permitted to discuss the event with co-witnesses) and were then individually taken into a separate room where they were privately asked to recall which person from the incident they believed was to blame. Participants were also asked to indicate how confident they were in their response (measured on a 5-point Likert scale). Confederates were used to expose the participants to misinformation about who was at fault during the discussion. The ages and genders of the participants were analysed to determine whether there were any age or gender-related differences in co-witness suggestibility. The study also controlled for group size during the investigation and analysis.

5.1.2. Study 1b: Group size and co-witness influence

The next empirical section was a continuation of analyses from study 1a, with different variables being analysed from the same data set. Therefore, this section was not a new or separate 'study', but rather an additional analysis from study one. This study aimed to gain a more accurate understanding of the risks of co-witness influence in relation to unanimity (whether the misinformation was presented by all of the co-witnesses) and misinformation size (the number of individuals presenting the misinformation). The same methodology and data set from study 1 was analysed for this study. Multiple independent conditions were used to manipulate the independent variables (misinformation size and unanimity of misinformation).

5.1.3. Study 2: Personality and co-witness suggestibility

The second study examined the relationship between co-witness suggestibility and individual differences in interpersonal characteristics. Participants ($N=473$) took part in an in a similar eyewitness simulation; five independent conditions were used to control for misinformation size. The participants then completed the Fundamental Interpersonal Relations Orientation-Behaviour assessment (FIRO-B; Schutz, 1958), a measure of expressed and wanted control, affection, and inclusion. The study analysed the participants FIRO-B scale scores to determine whether the interpersonal characteristics of an eyewitness could predict their susceptibility to co-witness influence.

5.1.4. Study 3: Co-witness familiarity and co-witness influence

The purpose of the third study was to examine the effects of pre-existing relationships between co-witnesses on statement similarity in blame attribution after a post-event discussion.. Participants ($N=420$) took part in a similar eyewitness simulation experiment, where they viewed and discussed a crime in groups of five. Participants either viewed and discussed the event with familiar co-witnesses, unfamiliar co-witnesses, or were not permitted to discuss the event with their co-witnesses (control). The group similarity scores were compared between the three experimental conditions to determine whether

participants with pre-existing relationships were more likely to provide similar recollections. The individual blame attributions were also analysed to determine if there were any differences in blame attribution accuracy between the three conditions.

5.1.5. Study 4: The impacts of perceived competence on co-witness influence

The purpose of the final study was to determine whether the perceived competence or authority of a co-witness could have an effect on their level of influence. Undergraduate students ($N=193$) participated in an eyewitness simulation, where they viewed crime footage and later discussed the event with a co-witness before giving a private statement (blame attribution). Through the use of confederates, participants were exposed to misinformation about the witnessed event. The background characteristics of the confederates were manipulated to alter their perceived level of intelligence (confederate as PhD student vs no indication of education) and authority (confederate as police officer vs no indication of occupation). The blame attributions and confidence scores of participants were compared between the different conditions to determine whether the perceived authority and intelligence of a co-witness had a mediating effect on their level of influence over other witnesses.

5.1.6. Multiple comparisons of data for studies one (a & b) and two

It must be noted that multiple comparisons of some of the same data set were used for study one (a & b) and three. The same data set ($N=608$) was analysed for studies one-a and one-b. This data set also included some of the data that had been collected from study two ($N=299$; control condition not included). The data from study two was used for study one because the studies used identical procedures, with the only exception being that participants from study two were asked to complete an additional questionnaire (FIRO-B) at the end of the experiment. However, the data for the control condition in study two was not used in the data set for study one due to the control participants from study two watching the video footage individually, whereas in study one, control participants viewed the footage in groups but were instructed not to discuss the footage. By combining some of the data sets, study one was able to yield a larger sample of comparable data. Bonferroni correction tests were conducted for each study to counteract the issue with multiple comparisons. The data sets for studies three and four were based on independent data sets; thus, in total, four separate experiments were conducted.

5.2. Methodological Considerations

5.2.1. Sampling

5.2.1.1. Participants

In total, the combined studies recruited one thousand six hundred and forty-six participants. Of these, two-hundred and fifty-one participants were randomly selected to play the role of a confederate (see below for confederate's role). As a result, their data was not used for the analysis, leaving an experimental sample size of 1395 'true' participants. However, three participants were removed from the experiment due to their inability to successfully complete the study, leaving a final sample of 1392 participants (666 males; 721 females; and 5 undisclosed) of mixed ages (16-83; $M = 30.07$, $SD = 14.01$). All four studies recruited participants through opportunistic and snowball sampling. A request for participation was advertised through online media, as well as through the circulation of flyers and posters within multiple cities centres in the UK. Participation was voluntary and participants did not receive payment for their participation, although some undergraduate participants from the University of Huddersfield received course credit (recognition for contributing to experimental research, participants are required to collect a quota to pass their module) for participation. Preliminary measures were undertaken to ensure that no participants had any serious visual impairments that might affect their ability to watch the crime footage on a screen. The studies aimed to ensure that there was an even distribution of age and gender between the experimental conditions. Due to the studies focusing on the effects of different internal and external moderators of co-witness suggestibility, the recruitment sampling criteria varied between each study and, thus, the specific sampling criteria are discussed in more detail within the respective experimental chapters.

Study three (Chapter 9) controlled for the variable of pre-existing relationships between the participants who were grouped together, with the participants in each experiment either having a pre-existing relationship with each other (for a minimum of three months) or being unfamiliar with one another. This variable was not controlled for in the other studies.

5.2.1.2. Confederates

A limitation of the existing research on blame conformity (e.g. Thorley, 2015) is that the studies have typically presented participants with co-witness misinformation through artificial statements from co-witnesses. Whilst, this methodological design can allow for inferences to be made on how eyewitnesses interact with written witness statements, the findings cannot be reliably used to model the effects of co-witness discussions on blame attribution, due to the experiments failure to facilitate interpersonal interactions between the participants. Thus, additional studies used a paradigm where participants would encounter the misinformation from other participants, so that the project could accurately understand the effects of co-witness discussions on blame attribution.

With the exception of study three, the research used confederates to expose the true participants to co-witness misinformation. Two hundred and fifty-one different confederates were used within the experiments to decrease the possibility of the results being specific to distinct characteristics of one confederate. Prior to starting the experiment, all participants within each eyewitness group (excluding the control group) were handed individual instruction sheets. Despite being told by the experimenter that the instruction sheets were identical, participants were handed one of two copies: the participants would either get a standard instruction sheet, which contained basic information about the research and the institution (given to true participants; see Appendix 1.A), or they would receive a confederate instruction sheet, which informed the participant that they had been chosen to be a confederate and provided further instructions on their role (see Appendix 1.B). Due to the study including different confederates in each trial, confederates were given specific information to state during the experimental process, to avoid any individual differences in responses from having an extraneous effect on the true participants. Study four used one confederate per trial, and required the individual to present additional information. As a result, the confederates from study four were recruited beforehand and had received full instructions prior to the trials.

All of the confederates were instructed to falsely suggest that the man in the yellow t-shirt had thrown the first hit during the discussion (when in reality, another man had thrown the first hit). They were given the option to provide the post-event information when they deemed it appropriate. They were advised to either present it before the participants (i.e. 'I remember seeing the man in the yellow top throw the first hit.');

after another participant had provided a correct report (i.e. 'No, I remember the man in the yellow top throwing the first hit.');

or after another participant had also provided the same incorrect report (i.e. 'Yes, I agree. I also remember seeing the man in the yellow top throwing the

first hit.'). The latter was more frequently used by confederates in the conditions that contained a majority group of confederates. The confederates were explicitly instructed not to add any other details to the discussion. If they were questioned about their report, the confederates were instructed to say *'well, that's what I remember seeing from the video'*. In conditions where multiple confederates were used within a trial they were instructed not to provide an identical response to the other group members (in order to prevent arousing the participant's suspicions) and were permitted to adjust their response accordingly (i.e. 'I remember seeing that from the video too'). The confederates were instructed to provide all of their statements in a confident manner, but were advised not to be assertive or to try to be purposefully persuasive. The discussion scripts were designed in accordance with the scripts used by Paterson and Kemp (2006b) in a similarly designed study. In order to generate a larger sample of true participants, some confederates were re-used in additional trials with new participants. Due to the use of a structured and consistent instruction list being provided to all confederates, it is unlikely that the recycling of confederates will have had any confounding effects on their level of influence.

5.2.2. Stimulus materials

Paterson and Kemp (2006a) identified incidents involving assault as the most frequently witnessed form of crime, with 30% of their eyewitness respondents reporting having witnessed such an event. Owing to its prevalence during real crimes, the present study used an incident involving assault as the witnessed event within the experiments. The same video footage was used for all four studies. Although some previous studies on co-witness influence have used a series of images/slides, instead of a video, as the experiment stimuli (e.g. Allan, Midjord, Martin, & Gabbert, 2011; Schwartz & Wright, 2012; Skagerberg & Wright, 2008b) it was decided that a video would provide greater ecological validity, as the participants would be able to see the event as a whole (especially if they are required to attribute blame). The footage from the present studies was a genuine closed-circuit television (CCTV) recording of a fight taking place within a bar and was presented to the participants on a computer monitor screen. The footage lasted approximately one minute and thirty seconds, and did not have an audio output. The recording shows the inside of a retail establishment (bar) with approximately fifteen customers present. Initially, two men in distinctively different clothing (one man is wearing a yellow t-shirt, whilst the other is wearing a dark green t-shirt) can be seen engaging in a discussion (see Figure 5.1). Approximately 21 seconds into the video, the man in the dark green t-shirt stands up and assaults the man in the yellow t-shirt by punching him (see Figure 5.2). Immediately after,

both men engage in a physical confrontation that lasts for approximately 50 seconds, before the two men are separated by the other customers (see Figure 5.3). The main focal point of interest from the stimulus was identifying which person had thrown the first punch, consequently starting the fight (a central detail to the incident). In reality, the video shows the man in the dark green t-shirt throwing the first punch; the participants' ability to correctly identify this was observed under different conditions to establish the effects of blame conformity.



Figure 5.1. Experimental stimulus, initial discussion between both men.



Figure 5.2. Experimental stimulus, the man in the dark green t shirt attacking first.



Figure 5.3. Experimental stimulus, both men being separated after their fight.

A pilot study was conducted to determine the accuracy of eyewitnesses when attempting to accurately recall which person had thrown the first punch. One hundred fifty-seven participants (96 females and 61 males) of mixed ages ($M = 29.02$, $SD = 11.32$) were individually shown the video footage and were later asked to identify which man had thrown the first punch. Participants attributed blame by indicating the clothing of their chosen suspect (i.e. 'the man in the dark green' or 'the man in the yellow'). The participants were also given the option to state that they were unsure, to reduce their tendency to guess. As Table 5.1 indicates, the results from the pilot study identified that despite the majority of participants producing the correct response. There was a clear distribution in eyewitness blame attribution, suggesting that participants within each group would be likely to hold different views as to who they believed had started the fight.

Table 5.1 Percentage of participant's (N= 157) blame attribution accuracy within pilot study

	Correct	Incorrect	Unsure
Count	62	59	36
Percentage	40%	32%	28%

The significant level of variance in responses were to be expected due to the study purposely incorporating the footage within the experiment for its high level of ambiguity in relation to correctly attributing blame. The study aimed to create an ambiguous task for two reasons. Firstly, the study wanted the participants to want to engage in a co-witness discussion with other participants (within the empirical studies) in order to allow them to

encounter co-witness information. Paterson and Kemp (2006a) found that eyewitnesses were significantly more likely to engage in post-event discussions with their co-witnesses, if there was some uncertainty in correctly determining what happened during the incident. Therefore, the induced level of uncertainty (as seen in Table 5.1) would encourage the participants to engage in a group discussion with their co-witnesses. Secondly, the process of blame conformity is more relevant to incidents where it can be difficult to determine which person is at fault; theories on informational influence would suggest that individuals are significantly less likely to be influenced by another person when there is an obvious correct answer (Baron et al., 1996; Suls & Wheeler, 2000). Therefore, to emulate an environment where blame conformity could be an issue, the study had to increase the task difficulty of making a correct blame attribution. The findings would be interpreted in light of the ambiguous nature of the stimulus.

5.2.3. General design and procedure

All four studies incorporated a between-subjects design where participants were placed in independent conditions to determine if the manipulated independent variables had an effect on their responses. Due to the studies incorporating different aims and objectives, the design and procedures of each individual study are also discussed within their respective chapters (Chapters 6-10). All four studies did, however, incorporate a similar experimental procedure to observe the effects of co-witness influence.

Participants were greeted upon arrival and handed an information sheet about the experiment as well as a consent form to sign (see Appendix 2), indicating their agreement with the study's terms. All participants were asked to state if they had any visual impairments that would hinder their abilities to view images on a screen. Moreover, participants were asked if they had any difficulties in recognising colours, words or items on computer screens. They were then asked to identify if they could accurately see a series of un-related images that were present on the screen. Participants who identified any visual impairments or could not accurately see the images on the screen were omitted from the experiment. Due to the ethical considerations of exposing participants to violent footage, all participants were informed that they would be viewing a CCTV footage that contained violence, in order to gain consent from them. Other details with regards to the aims of the experiments were kept to a minimum. Participants were told that the main aim of the experiment was to identify the attitudes of individuals on watching violence. After giving consent, participants were either placed in a group, pair, or on their own (depending on the

study and experimental condition), and were asked to view the CCTV footage on a computer monitor. All participants were required to sit exactly one meter away from the screen to ensure that all participants throughout the studies viewed the footage from the same distance.

After the footage had finished the second phase of the experiment, the group discussion, began. Based on research indicating that the majority (67%) of co-witnesses engage in post-event discussions immediately after witnessing the event (Paterson and Kemp, 2006a), the present study was designed so that a group discussion would commence shortly after the footage had finished. With the exception of the control group, participants were then allocated one minute to discuss in their groups (of two to six participants, depending on the experimental condition) who they believed had thrown the first hit. During this time, the experimenter would leave the room to eliminate their presence from affecting the participant's behaviour. The group discussions were capped at one minute to ensure that no participant could question the confederates for a significantly longer period than another participant from a separate trial. Participants in the control groups were not permitted to discuss the footage; instead, they were asked to sit silently until they were called to leave the room for questioning— the researcher would stand outside the room and listen to ensure that participant groups from the control conditions would not discuss the event with each other.

The final phase of the experiment was the eyewitness statement process. Participants were taken into a private room individually and asked to try and recall who they believed had thrown the first hit. Participants were instructed to only report information that they remembered seeing (see Appendix 4 for script). As mentioned previously, all participants provided their response by indicating the colour of the suspect's clothing (yellow top or dark green top). A limitation of this process was that some participants could have been at risk of identifying the incorrect colour of clothing on the correct suspect (or vice-versa), however, preliminary measures were taken to ensure that no participants with difficulties in visual and colour perception undertook the study – thus it can be contended that such risks will have been significantly reduced. Owing to the nature of this task, it can be acknowledged that the participants were tasked with recalling central details to the event (memory retrieval) and interpreting the incident to determine who was at fault for throwing the first hit (decision making). It can also be argued that the task required participants to correctly recall peripheral details about the event as well, due to participants identifying the guilty suspect through indicating what colour clothing he was wearing. A potential risk that the study had to avoid was the tendency for participants to make a guess when attributing blame. By doing so, the participants would have a 50% chance of being correct, and this

would significantly reduce the internal validity of the present study. As a result, all participants were directly advised by the interviewer to avoid making any responses through guessing. Instead, participants were given the option to state that they were uncertain if they were unable to answer the question. All participants produced one of three responses, when asked to identify which man had thrown the first hit. Eyewitnesses who blamed the man in the yellow top (misinformation) were scored as being *incorrect*, participants who blamed the man in the dark green top were scored as being *correct*, and participants who stated that they were uncertain were scored as being *unsure*. The participants from studies one, two, and four were also asked to indicate how confident they were in their blame attribution judgement. In line with previous research on eyewitness confidence (see Mudd & Govern, 2004), confidence judgements were measured using a five-point scale (five meaning maximum confidence). Participants who answered "unsure" were not asked to give a confidence rating due to their inability to identify an offender. With the exception of the second study (see chapter 8 for extended procedure), the rest of the studies ended at this point. Participants were thanked for their participation and were debriefed about the studies full aims. Confederates were also questioned after the experiment to determine whether they were able to correctly present the participants with misinformation — all confederates indicated that they had carried out their instructions correctly.

A limitation of the procedure used in the present studies was that the group discussions of the participants were not recorded for inspection afterwards. This meant that the studies could not reliably guarantee that all confederates performed correctly and that all participants from the control conditions abstained from discussing the incident. However, the decision to not record the participant's discussions can be justified. Due to the ethical implications of recording individuals without their consent, the experimenter will have had to inform participants that they would be getting recorded during the experiment. The participants' awareness of being monitored may have influenced their behaviours and subsequent responses as a result.

5.3. Ethical considerations

The research was conducted in accordance with the American Psychological Association (APA) and British Psychological Society (BPS) research guidelines (APA Ethical Principles of Psychologists and Code of Conduct, 2010; BPS Code of Human Research Ethics, 2011). In addition, all four studies were approved by the University of Huddersfield's School Research Ethics Panel (SREP) prior to data collection (see Appendix 3). Standard procedures

for gaining informed consent were used, with participants receiving an information sheet with their consent form (see Appendix 2) and having the option to ask any questions before providing consent. The study made sure to provide all participants with a clear disclaimer, within the information sheet, informing them that a video containing violence would be used in the experiment. Additionally, the studies maintained complete anonymity of participant information and all participants were given the option to withdraw from the study at any time during the experiment without the need to provide an explanation. Although the footage contained mild violence, there was no blood or serious harm shown within the footage. Further, a minimum age criteria of 16 years was set for participation, due to the video depicting mild violence. At the end of the experiment, the participants were debriefed about the study and had the opportunity to ask any questions they had. Contact details of the researcher and of relevant sources of support were also provided to the participants, should they have any further inquiries or issues later on.

Chapter 6

Study 1a: Gender & Age Effects on Co-Witness Suggestibility

6.1. Introduction

The majority of research on co-witness influence has shown that some eyewitnesses are inherently more suggestible than others. Research indicates that the suggestibility of an individual can indeed be influenced by numerous different internal variables (Doughty et al., 2017; Loftus, 2005). The literature on memory recall accuracy identifies age and gender as two variables that can have confounding effects on eyewitness statement accuracy (Areh, 2011; Megreya, Bindermann, & Havard, 2011; Memon et al., 2003; Rehnman & Herlitz, 2007; Yarmey, 2004). These findings have led many researchers to question whether similar gender and age-related differences may also exist in an eyewitness's susceptibility of to co-witness influence (co-witness suggestibility).

6.1.1. Gender-related differences in co-witness suggestibility

When attempting to investigate gender differences in memory conformity, the existing research within the literature is contradictory. Multiple studies have produced evidence indicating that male eyewitnesses are more susceptible to memory conformity (Eck, Thoftne, Sponsor, & VanVoorhis, 2008; Loftus et al., 1992). Conflictingly, there is evidence which suggests that there are no gender-related differences in memory conformity (Butts, Mixon, Mulekar, & Bringmann, 1995; Schwarz, 2013). The differences in results between the studies can be attributed to each study incorporating varying memory recall tasks, as the process of social influence has been shown to be highly dependent on the task at hand (Baron, Vamdelo, & Brunsman, 1996; Suls & Wheeler, 2000). With regard to research on blame conformity, there is a gap within the literature investigating the relationship between an eyewitness's gender and their susceptibility to co-witness influence during blame attribution.

6.1.2. Age-related differences in co-witness suggestibility

The age of eyewitnesses has been found to have a moderating effect on their suggestibility to misleading questions (Coxon & Valentine, 1997; Dodson & Krueger, 2006; Mitchell, Johnson, & Mather, 2002). However, with regards to suggestibility to misinformation from co-witnesses the previous literature is incongruous. Gabbert et al. (2003) found no age-related differences in co-witness suggestibility, yet in a later study Gabbert, Memon, Allan, and Wright (2004) produced evidence suggesting that younger eyewitnesses were be more susceptible to memory conformity. With regards to blame attribution; there is a gap within the literature investigating the relationship between age and blame conformity.

6.2. Present study

Although a large body of research exists on the effects of co-witness influence in eyewitness recall, the majority of the literature looks at the effects of co-witness influence on eyewitness accuracy for recalling peripheral items and not the implicit attribution of blame. Research on co-witness influence has shown that eyewitnesses can mistakenly recall items from post-event discussions in their statements (e.g. Gabbert et al., 2003; Gabbert et al., 2004; Hope et al., 2008). However, such studies failed to determine whether eyewitnesses could be influenced by others when attempting to attribute blame correctly. Often within certain types of crimes (i.e. robbery & fighting), it can be difficult for eyewitnesses to ascertain who is at fault (Thorley & Rushton-Woods, 2013). For this reason, it is important to determine whether eyewitnesses are likely to draw on the judgement of others when attempting to attribute blame. Recent research has suggested that eyewitnesses can be influenced by their co-witnesses when attempting to attribute blame (Thorley, 2015; Thorley & Rushton-Woods, 2013). However, the relationship between blame conformity and the eyewitness's age and gender remains unclear. Therefore, the purpose of the current research was to evaluate whether age and gender related differences exist in co-witness suggestibility when attempting to attribute blame.

To achieve this, the study had three main objectives. The first objective was to establish if age and gender differences existed in the blame attribution of eyewitnesses, after being exposed to misinformation. It was theorised that eyewitnesses could be influenced by others, even if they had not conformed to their incorrect views. Eyewitnesses may instead lose confidence in their own judgements, rather than fully conforming to the

misinformation (Semmler et al., 2004; Wright & Skagerberg, 2007). Such effects could also have detrimental effects on an investigation, given that research shows that jurors will be less likely to believe statements from eyewitnesses who lack confidence (Skagerberg & Wright, 2009). Therefore, the second objective was to identify if there were any significant age and gender related differences in the confidence of eyewitnesses who were exposed to contradicting misinformation, but refrained from conforming. Additionally, in cases where the witness would already hold an incorrect recollection of the event prior to discussing the event with co-witnesses, research suggests that exposure to similar misinformation could cause the witness to gain more confidence in their erroneous memory report (Allwood et al., 2006; Semmler et al., 2004). This can be problematic as research has demonstrated that a confident eyewitness will be more likely to influence both jurors and other co-witnesses (Goodwin et al., 2013). Owing to this, the third objective of the present study was to identify if there were any significant age and gender related differences in the confidence of participants who produced a false blame attribution.

The study also aimed to incorporate an experimental design that would be impervious to the limitations of previous research. Unlike previous studies in the field, the present study controlled for extraneous variables that have been proven to have a significant effect on social influence. The extraneous variables controlled for were group size and the unanimity of this misinformation (whether the misinformation was provided by all of the co-witnesses). By including such controls, the study would boast a much stronger internal validity than the previous research within the literature. The present study measured age as a continuous variable rather than categorising individuals into subjective age groups. By doing so, the study measured the relationship between age and co-witness influence continuously and, thus, the results would enable inferences to be made for eyewitnesses of all age groups. The study also aimed to recruit a sample size larger than that of the previous studies, in order to improve the reliability and generalizability of the results. Finally, the present study observed multiple variables in an attempt to measure co-witness influence. The majority of the previous studies only used the explicit statements of incorrect information as an indication of having been influenced. However, the present study argues that eyewitnesses can be influenced by others even if they do not conform to their incorrect views. Eyewitnesses may instead lose confidence in their own judgements, rather than fully conforming to the misinformation. Therefore, the present study observed confidence ratings in statements, as well as measuring the frequency of cases where eyewitnesses were not able to attribute blame due to uncertainty.

To date, no research study has attempted to investigate the effects of age and gender on an eyewitness's susceptibility to blame conformity. Instead the present study had

to rely on similar studies which had investigated the effects of age and gender on general memory conformity. However, even the literature on memory conformity was incongruous, with various studies producing contradicting results, making it difficult to confidently determine the likely direction of the relationships, if any. Therefore, no hypotheses were made. Instead, the study was exploratory in nature, attempting to determine whether gender and age-related differences in co-witness suggestibility during blame attribution existed.

6.3. Methodology

6.3.1. Participants

Eight hundred and sixty participants (409 males; 451 females, aged between 18 and 82 years ($M = 28.33$, $SD = 12.64$) were recruited through opportunistic sampling. Of these, two hundred and forty-nine participants (121 males; 128 females) were randomly selected to play the role of a confederate. As a result, their answers were not included in the data analysed; additionally, the data from three of the remaining participants were not included in the analyses due to the participants failing to successfully complete the experiment; leaving a total sample size of six hundred and eight participants (288 males; 320 females), aged between 18 and 82 years ($M = 28.95$, $SD = 13.04$). The study aimed to get an evenly distributed number of participants in relation to age; however, due to the sample criteria requiring participants to have adequate vision to clearly observe the monitor, the size of elderly participants was limited in comparison to younger participants. The sampling procedure, along with details regarding the preliminary measures for participant suitability are presented in chapter 5.2.1.1.

6.3.2. Design

A between-subjects design was employed by the study, with gender acting as the independent variable and age acting as the continuous variable compared within the study. The participants were randomly allocated to one of six independent group conditions. The group conditions were used to manipulate the controlled variables of misinformation size (size of the group presenting the misinformation) and unanimity of misinformation, through altering the number of participants and confederates (misinformation source) present during the trials. Condition one was the control condition. Participants in this group viewed the

footage and later, provided a response without any prior discussion with other participants. Within condition two, each participant viewed and discussed the incident with one confederate before providing a response (total group size of two). In condition three, each participant viewed and discussed the incident with one additional participant and one confederate before providing a response (total group size of three). In condition four, each participant viewed and discussed the footage with four other participants and one confederate before giving a response (total group size of six). Within condition five, each participants viewed and discussed the footage with two confederates before providing a response (total group size of three). In condition six, participants viewed and discussed the incident with five confederates before providing a response (total group size of six). As Table 6.1 illustrates, the misinformation was guaranteed to be presented unanimously in conditions five and six due to the participant being placed into a confederate-only group. Whereas in conditions three and four, the presence of multiple true participants meant that the participants were likely to encounter other dissenters, breaking the chain of unanimity. However, a caveat of the present study’s design is that participants within conditions two and three may have still been subjected to misinformation from a unanimous group, if the remaining participants had all erroneously provided misleading responses. In spite of this risk, the researchers argued that statistically, it would have been highly likely for at least one dissenter to be present within the majority of the trials in conditions three and four. Within condition two, participants were paired up with one confederate. Resultantly, the misinformation was not provided by a majority group and there were also no other dissenters present. The first condition acted as the control group. Careful measures were undertaken to ensure a relatively even distribution of age and gender within all of the experimental conditions (see Tables 6.1 and 6.2).

Table 6.1 Frequencies for experimental conditions (N=608)

Condition	Group size	True participants	Confederates	Age	
				M	Std Dev.
1 (Control) (N=174)	1	1	0	35.06	17.58
2 (N=38)	2	1	1	20.92	2.69
3 (N=56)	3	2	1	26.64	8.94
4 (N= 170)	6	5	1	28.52	10.98
5 (N=94)	3	1	2	24.66	7.7
6 (N=76)	6	1	5	26.91	10.29

A recurrent limitation with the majority of studies investigating the relationship between age and eyewitness performance was that the independent variable of age was

dichotomized as a nominal variable. Participants were grouped as being either 'young adults' (often undergraduate students) or 'elderly participants' (often participants past the age of 60) through setting cut off points of age, which could be seen as being subjective. A limitation to this approach is that the categorisation of the participants does not allow us to identify if the relationship between age and co-witness suggestibility is linear and does not identify how middle aged eyewitnesses are likely to perform. The present study assessed the participants' ages as continuous variables.

Two dependent variables were observed to measure co-witness suggestibility. The first dependent variable measured was the participants blame attributions (after witnessing the crime). This variable was measured to determine whether the participants had conformed to their co-witness's (confederate) erroneous judgement (blame conformity). The second dependent variable measured was the participants' confidence scores in their blame attributions. This variable was measured to determine whether there were any gender or age-related differences in eyewitness confidence after a co-witness discussion. Keeping in line with previous research on eyewitness confidence (see Mudd & Govern, 2004), confidence judgements were measured using a five-point scale (five meaning maximum confidence). Participants who answered 'unsure' were not asked to give a confidence rating due to their inability to identify an offender.

6.3.3. Materials

A closed circuit television (CCTV) footage of a bar fight erupting (described in chapter 5.2.2) was used as the study's experimental stimulus. The main point of interest within the footage was the indication that the man in the dark green t-shirt had thrown the first punch and not the man in the yellow t-shirt.

6.3.4. Procedure

The main procedure which is discussed in chapter 5.2.3 was implemented within this study. During the private interview (after the group discussion had ended), the investigator recorded the age and gender of each participant, before questioning them about the witnessed incident.

6.4. Results

The purpose of the present study was to identify if age and gender-related differences existed in eyewitness suggestibility when attempting to attribute blame. The main results are presented in two sections. First, evidence for the relationship between the age and gender of the participant with co-witness suggestibility is given through an analysis of eyewitness blame attribution (first dependent variable). The second section of the results investigates the relationship between the age and gender of the participant with co-witness suggestibility through analyses of eyewitness confidence (second dependent variable). Means and standard deviations for all variables are presented in Table 6.2-6.4.

A preliminary one-way between groups analysis of variance was first conducted to determine whether the variable of participant age was similar across all experimental conditions. Participants were divided into six groups according to their allocated group conditions (see Table 6.1). There was a statistically significant difference at the $p < .001$ level in the age of the participants across the six conditions [$F(5, 602) = 14.81, p < .001$]. The difference in mean ages between groups was medium. The effect size, calculated using eta squared, was .11. Post-hoc comparisons using the Tukey HSD test indicated that the average age of participants within condition one (control condition) ($M = 33.34, SD = 6.91$) was significantly higher than the average ages of participants in the experimental conditions (see Table 6.1 for mean ages). There were no other significant differences in mean age between the remaining conditions. The observed differences were considered when interpreting and discussing the results within the discussion.

Table 6.2. Distribution of responses within all conditions.

	<i>N</i>	Blame attribution (%)		
		Correct	Incorrect	Unsure
Condition 1 (control)	174	78 (44.8%)	60 (34.5%)	36 (20.7%)
Male	85	37 (43.5%)	29 (34.1%)	19 (22.4%)
Female	89	41 (46.1%)	31 (34.8%)	17 (19.1%)
Condition 2 (1p/1c)	38	14 (36.8%)	16 (42.1%)	8 (21.1%)
Male	19	7 (36.8%)	7 (36.8%)	5 (26.3%)
Female	19	7 (36.8%)	9 (47.4%)	3 (15.8%)
Condition 3 (2p/1c)	56	19 (20.2%)	61 (64.9%)	14 (14.9%)
Male	29	11 (37.9%)	12 (41.4%)	6 (20.7%)
Female	27	15 (55.6%)	8 (29.6%)	4 (14.8%)
Condition 4 (5p/1c)	170	6 (7.9%)	61 (80.3%)	9 (11.8%)
Male	84	42 (50%)	27 (32.1%)	15 (17.9%)
Female	86	38 (44.2%)	34 (39.5%)	14 (16.3%)
Condition 5 (1p/2c)	94	26 (46.4%)	20 (35.7%)	10 (17.9%)
Male	41	9 (22%)	27 (65.9%)	5 (12.2%)
Female	53	10 (18.9%)	34 (64.2%)	9 (17%)
Condition 6 (1p/5c)	76	80 (47.1%)	61 (35.9%)	29 (17.1%)
Male	30	3 (10%)	26 (86.7%)	1 (3.3%)
Female	46	3 (6.5%)	35 (76.1%)	8 (17.4%)
Total	608	223 (36.7%)	279 (45.9%)	106 (17.4%)
Male	288	109 (37.8%)	128 (44.4%)	51 (17.7%)
Female	320	114 (35.6%)	151 (47.2%)	55 (17.2%)

p= number of participants during each group discussion, c= number of confederates present during each group discussion.

Table 6.3 Means and standard deviations of age for all conditions and responses.

	N (%)	Mean Age (Std. Dev)
Condition 1	174	35.06 (17.58)
Correct	78 (44.8%)	33.23 (16.43)
Incorrect	60 (34.5%)	36.15 (19.86)
Unsure	36 (20.7%)	37.19 (15.97)
Condition 2	38	20.92 (2.69)
Correct	14 (36.8%)	21.07 (2.95)
Incorrect	16 (42.1%)	21.69 (2.6)
Unsure	8 (21.1%)	19.13 (1.55)
Condition 3	56	26.624 (8.94)
Correct	26 (46.4%)	26.77 (9.25)
Incorrect	20 (35.7%)	25.45 (6.66)
Unsure	10 (17.9%)	28.7 (12.22)
Condition 4	170	28.52 (10.98)
Correct	80 (47.1%)	28.15 (10.66)
Incorrect	61 (35.9%)	27.15 (10.2)
Unsure	29 (17.1%)	32.45 (12.78)
Condition 5	94	24.66 (7.7)
Correct	19 (20.2%)	25.79 (10.25)
Incorrect	61 (64.9%)	24.13 (5.75)
Unsure	14 (14.9%)	25.43 (11.06)
Condition 6	76	26.91 (10.29)
Correct	6 (7.9%)	26.67 (4.8)
Incorrect	61 (80.3%)	26.67 (9.88)
Unsure	9 (11.8%)	28.67 (10.29)
Total	608	28.95 (13.04)
Correct	223 (36.7%)	29.08 (12.6)
Incorrect	279 (45.9%)	27.89 (12.6)
Unsure	106 (17.4%)	31.45 (14.3)

Table 6.4. Means and standard deviations of confidence for all conditions and responses.

	N	Mean confidence (<i>Standard deviation</i>)		
		Correct	Incorrect	Total
Condition 1	138	3.09 (1.12)	2.98 (1.07)	3.04 (1.09)
Male	66	3.14 (1.23)	3.24 (.99)	3.18 (1.12)
Female	72	3.05 (1.02)	2.74 (1.09)	2.92 (1.06)
Condition 2	30	3.43 (.94)	3.31 (1.08)	3.37 (1)
Male	14	3.71 (.76)	3.29 (1.25)	3.5 (1.02)
Female	16	3.14 (1.07)	3.33 (1)	3.09 (1.16)
Condition 3	47	3.5 (1.03)	3.05 (1)	3.34 (1.05)
Male	24	3.55 (.93)	3.5 (.8)	3.58 (.88)
Female	23	3.47 (1.13)	2.38 (.92)	3.09 (1.16)
Condition 4	141	3.4 (1.11)	2.92 (1.11)	3.19 (1.13)
Male	69	3.38 (1.03)	3 (1.18)	3.23 (1.1)
Female	72	3.42 (1.2)	2.85 (1.08)	3.15 (1.17)
Condition 5	80	3.26 (.93)	3.38 (.97)	3.35 (.96)
Male	36	3.22 (.83)	3.59 (.89)	3.5 (.88)
Female	44	3.3 (1.06)	3.21 (1.01)	3.23 (1.01)
Condition 6	67	3.17 (.75)	3.41 (.96)	3.39 (.94)
Male	29	2.67 (.58)	3.38 (.98)	3.31 (.97)
Female	38	3.67 (.58)	3.43 (.95)	3.45 (.92)
Total	503	3.28 (1.07)	3.17 (1.04)	3.23 (1.06)
Male	238	3.3 (1.06)	3.23 (1.01)	3.32 (1.03)
Female	265	3.27 (1.09)	3.05 (1.05)	3.14 (1.07)

6.4.1. Control group

6.4.1.1. Age and gender-related differences in blame attribution accuracy

The results from the control group (condition one) offer an indication of how well participants performed on the eyewitness task, when no misinformation was presented. As illustrated in Table 6.2, a high proportion of the participants (34.5%) incorrectly blamed the wrong individual for starting the fight. This was anticipated by the researchers because the aim of the experimental design was to use a video footage that would naturally cause discrepancies to arise between different eyewitnesses. By administering an ambiguous task, participants would be more likely to be uncertain about the task at hand and thus, would be more attentive to the reports of their co-witnesses (Suls & Wheeler, 2000; Walther et al., 2002).

The responses of the participants from the control condition were analysed to determine whether their age and gender had any inherent relationship with general response accuracy. Multinomial Logistic regression was used to analyse the effects of age and gender on eyewitness blame attribution, when no post-event information was presented. The statements from participants were classified into three groups: those who blamed the man in the light yellow top for starting the fight (incorrect response), those who blamed the man in the dark green top as starting the fight (correct response), and those who had said they were unsure on who had started the fight (unsure). Due to the dependent variable consisting of three outcomes, two regressions were conducted: one with incorrect response (yellow top) as the reference category, and one with the correct response (dark green top) as the reference category. The main interest of current analysis was focused on the relationship between age and gender with blame attribution accuracy (3 categories) while controlling for the group condition. The analysis shows that the model fit was not significant [$\chi^2(4) = 1.99, p > .05$], which indicated that the full models did not predict significantly better, or more accurately, than the null model. The results indicated that there were no relationships between age and gender with blame attribution accuracy, in participants who did not partake in a co-witness discussion. Therefore, any relationships observed between age and gender with blame attribution accuracy within the experimental conditions could be attributed to co-witness discussions.

The first column in Table 6.5 has the outcome of 'correct response' compared to "incorrect response" (reference category). The results suggested that age and gender did not have any significant effects on eyewitness blame attribution accuracy ($p > 0.05$).

The second Column in table 6.5 has the outcome of 'unsure' compared to 'incorrect response' (Reference category). The statistical analysis indicated that there was again no significant relationship between the variables of age and gender with eyewitness blame attribution accuracy ($p > .05$).

The third Column in table 6.5 has the outcome of 'unsure' compared to 'correct response' (Reference category). The statistical analysis indicated that there was again no significant relationship between the variables of age and gender with eyewitness blame attribution accuracy. The results from the control group indicated that neither age nor gender were able to significantly predict the accuracy of the eyewitnesses' blame attributions, therefore, any significant differences observed within the experimental groups could be confidently attributed as an effect of a post-event discussion.

Table 6.5. Multinomial logistic regression predicting blame attribution.

Variable	Correct response ^a (N=78)		Unsure ^a (N=36)		Unsure ^b (N=36)	
	OR (95% CI)	SE	OR (95% CI)	SE	OR (95% CI)	SE
Age	1 (.97/1.01)	.01	1 (.98/1.03)	.01	1.01 (.99/1.04)	.01
Gender						
Male	.94 (.48/1.86)	.35	1.21 (.53/2.76)	.42	1.28 (.58/2.83)	.41
Female	1		1		1	

Note. a= Reference group: 'incorrect response' (n=60); b= Reference group: 'correct response' (n=78). OR = Odds Ratio. SE = Standard Error. 95% CI = Confidence Interval. * p<.05. ** p<0.005. *** p<0.001

6.4.1.2. Age and gender-related difference in eyewitness confidence

The self-reported confidence scores of the participants from the control condition were also analysed to determine whether their age and gender had any inherent relationship with general eyewitness confidence. Multiple regression was performed to investigate the ability of age and gender to predict eyewitness confidence in blame attribution. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. Since no priori hypotheses had been made to determine the order of entry of the predictor variables, a direct method was used for the multiple linear regression analysis. The two independent variables only explained 2.6% of variance in eyewitness confidence [$F(2, 135) = 1.79, p > .05$] (See Table 6.6). In the final model neither of the predictor variables were statistically significant, indicating that there were no age or gender-related differences in eyewitness confidence. Therefore, any significant differences observed within the experimental groups can be confidently attributed as an effect of a post-event discussion.

Table 6.6. Linear Regression Model of eyewitness confidence.

	R^2	β	B	SE	CI 95% (B)
Model	.03				
Age		.12	.01	.01	-.004 / .02
Gender		-.13	-.27	.19	-.64 / .09

Note. Statistical significance: *p < .05; **p < .01; ***p < .001

6.4.2. Blame attribution

The first objective was to establish if age and gender differences existed in the blame attribution of eyewitnesses, after being exposed to misinformation. Multinomial Logistic regression was used to analyse the effects of age and gender on eyewitness blame attribution, after a post-event discussion had occurred. The statements from participants were classified into three groups: those who blamed the man in the yellow top for starting the fight (incorrect response), those who blamed the man in the dark green top for starting the fight (correct response), and those who had said they were unsure on who had started the fight (unsure). Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. Due to the dependent variable consisting of three outcomes, two regressions were conducted: one with incorrect response (yellow top) as the reference category, and one with the correct response (dark green top) as the reference category. The main interest of current analysis was focused on the relationship between age and gender with blame attribution accuracy (3 categories) while controlling for the group condition. The analysis found that the model fit was significant [$\chi^2(14) = 82.59, p < .001$], which indicated that the full model predicted significantly better, or more accurately, than the null model.

The first column in Table 6.7 has the outcome of 'correct response' compared to 'incorrect response' (reference category). The results suggested that age and gender had no significant effect on eyewitness blame attribution accuracy ($p > 0.05$). In relation to the group condition, the results suggested that participants who were exposed to the misinformation from a unanimous majority group (condition 5, $OR = .24$; and condition 6, $OR = .08$), compared to participants from the control condition, were significant more likely to report the misinformation (incorrect response). The measures of association were medium to very large, in accordance to Cohen (1988) and Sawilowsky (2009). The effect sizes, calculated using Cohen's d , were $-.79$ and -1.39 , respectively.

The second Column in Table 6.7 has the outcome of 'unsure' compared to 'incorrect response' (Reference category). The results suggested that age and gender had no significant effect on eyewitness blame attribution accuracy ($p > 0.05$). In relation to the group condition, the results suggested that participants who were exposed to the misinformation from a unanimous majority group (condition 5, $OR = .45$; and condition 6, $OR = .28$), compared to participants from the control condition, were significant more likely to report the misinformation (incorrect response). The measures of association were small to medium, in accordance to Cohen (1988). The effect sizes, calculated using Cohen's d , were $-.44$ and $-.7$

The third Column in Table 6.7 has the outcome of 'unsure' compared to 'correct response' (Reference category). The statistical analysis indicated that there was again, no significant relationship between the variables age and gender with eyewitness blame attribution accuracy ($p > .05$). In relation to the group condition, the results suggested that participants who were exposed to the misinformation from a unanimous majority group of five confederates (condition 6, $OR = 3.75$), compared to participants from the control condition, were significant more likely to produce an unsure response. The measure of association was medium, in accordance to Cohen (1988). The effect size, calculated using Cohen's d , was .73.

Table 6.7. Multinomial logistic regression predicting blame attribution.

Variable	Correct response ^a (N=223)		Unsure ^a (N=106)		Unsure ^b (N=106)	
	OR (95% CI)	SE	OR (95% CI)	SE	OR (95% CI)	SE
Age	1 (.98/1.01)	.01	1.01 (1/1.03)	.01	1.02 (1/1.03)	.01
Gender						
Male	1.01 (.7/1.47)	.19	1.01 (.64/1.6)	.23	1 (.63/1.6)	.24
Female	1		1		1	
Condition						
1	1		1		1	
2	.66 (.29/1.48)	.42	1.04 (.39/2.79)	.5	1.58 (.59/4.28)	.51
3	.99 (.5/1.95)	.35	.95 (.39/2.3)	.45	.97 (.41/2.26)	.43
4	1 (.62/1.62)	.25	.88 (.47/1.64)	.32	.88 (.49/1.6)	.31
5	.24 (.13/.44)***	.32	.45 (.21/.95)*	.38	1.92 (.84/4.37)	.42
6	.08 (.03/.19)***	.47	.28 (.12/.64)**	.42	3.75 (1.22/11.48)*.57	

Note. a= Reference group: 'incorrect response' (N=279); b= Reference group: 'correct response' (N=223). OR = Odds Ratio. SE = Standard Error. 95% CI = Confidence Interval. * $p < .05$. ** $p < 0.005$. *** $p < 0.001$

The researcher wanted to determine whether the strength of the predictor variables would differ after the removal of the conditions where the misinformation was not presented unanimously (conditions three and four). Therefore, a second test of multinomial logistic regression was conducted with the conditions that did not have a unanimous majority group

of confederates (Conditions three and four) omitted (adjusted $N= 382$), to see if this would have an impact on the predictor variables' abilities to predict blame attribution. The analysis found that the model fit was significant [$\chi^2 (10) = 62.25, p < .001$], which indicated that the full model predicted significantly better, or more accurately, than the null model. As shown in Table 6.8, there were no significant changes in the results — with regard to significant findings and general effect size strengths— after the removal of conditions three and four.

Table 6.8. Multinomial logistic regression predicting blame attribution.

Variable	Correct response ^a ($N=117$)		Unsure ^a ($N=67$)		Unsure ^b ($N=67$)	
	OR (95% CI)	SE	OR (95% CI)	SE	OR (95% CI)	SE
Age	.99 (.98/1.01)	.01	1.01 (.99/1.03)	.01	1.01 (.99/1.03)	.01
Gender						
Male	.98 (.56/1.6)	.25	.91 (.52/1.61)	.29	.93 (.51/1.7)	.31
Female	1		1		1	
Condition						
1 (control)	1		1		1	
2 (1p/1c)	.62 (.27/1.42)	.42	.9 (.33/2.45)	.51	1.46 (.54/4)	.51
5 (1p/2c)	.22 (.12/.43)***	.33	.4 (.19/.86)*	.38	1.8 (.78/4.13)	.42
6 (1p/5c)	.07 (.03/.18)***	.42	.26 (.11/.59)**	.43	3.56 (1.16/10.97)*	.57

Note. a= Reference group: 'incorrect response' ($N=198$); b= Reference group: 'correct response' ($N=117$). OR = Odds Ratio. SE = Standard Error. 95% CI = Confidence Interval. * $p < .05$. ** $p < 0.005$. *** $p < 0.001$

6.4.3. Eyewitness confidence in blame attribution

The second and third objectives of the study were to identify if there were any significant age and gender-related differences in the confidence of eyewitnesses who were exposed to contradicting misinformation (but provided correct responses) and to investigate

for possible age and gender differences in the confidence of participants who had made a false blame attribution, respectively. The descriptive data for the continuous variables are presented in Table 6.9.

Table 6.9. Descriptive statistics, reliability, and correlations for all continuous variables (N = 223).

Variables	Confidence	Age
Confidence	1	
Age	.05	1
<i>Means</i>	3.22	28.41
<i>Standard Deviations</i>	1.06	12.71
<i>Range</i>	1-5	18-82

Note. No statistical significance measured between variables.

A three-way between groups analysis of covariance (ANCOVA) was conducted to explore the impact of gender (male; female), response (correct; incorrect) and group condition (conditions one-six) on eyewitness confidence, whilst also examining, and controlling for, the covariate of age. Preliminary observations indicated that the data satisfied the ANCOVA assumptions relating to independence of covariate and treatment effect, and homogeneity of regression slopes.

The covariate, age, was not significantly related to the confidence scores of participants, [$F(1,477) = 3.11, p > .05, r = .05$]. There were also no significant main effects of gender, [$F(1,477) = 1.28, p > .05$]; group condition, [$F(5,477) = 1.39, p > .05$]; or response, [$F(1,477) = .134, p > .05$] — after controlling for the participant's age. The interaction effect between gender and group conditions was not statistically significant [$F(5, 477) = 1.07, p > .05$]. The interaction effect between gender and response was also not statistically significant [$F(1, 477) = 2.09, p > .05$]. The interaction effect between group condition and response was also not statistically significant [$F(5, 477) = 1.25, p > .05$]. With regards to the interaction effect between all three independent variables (gender, group conditions, and response) the analysis did not find a statistically significant effect [$F(5,477) = .64, p > .05$].

The researcher wanted to determine whether the relationship between the independent variables and confidence would differ after the removal of the conditions where the misinformation was not presented unanimously (conditions three and four). Therefore, a

second three-way ANCOVA was conducted with the conditions that did not have a unanimous majority group of confederates (Conditions three and four) omitted (adjusted $N= 315$), to see if this would have an impact on the relationship between the independent variables and eyewitness confidence. After the removal of conditions three and four, the analysis produced similarly non-significant results: The covariate, age, was not significantly related to the confidence scores of participants, [$F(1,298) = 1.07, p > .05, r=.01$]. There were also no significant main effects of gender, [$F(1,298) = .09, p > .05$]; group condition, [$F(3,298) = 1.99, p > .05$]; or response, [$F(1,298) = .05, p > .05$] – after controlling for the participant's age. The interaction effect between gender and group conditions was not statistically significant [$F(3, 298) = 1.04, p > .05$]. The interaction effect between gender and response was also not statistically significant [$F(1, 298) = .69, p > .05$]. The interaction effect between group condition and response was also not statistically significant [$F(3, 298) = .36, p > .05$]. With regards to the interaction effect between all three independent variables (gender, group conditions, and response) the analysis did not find a statistically significant effect [$F(3,298) = .67, p > .05$].

6.5. Discussion

The purpose of the present study was to determine whether age and gender-related differences existed in eyewitness suggestibility when attempting to attribute blame. Specifically; the study was focused on identifying if the age and gender of an eyewitness could predict their level of suggestibility to misinformation from co-witnesses when attempting to attribute blame. Although some previous studies have attempted to investigate gender and age-related differences in eyewitness suggestibility, the majority of these studies (e.g. Gabbert et al., 2003; Gabbert et al., 2004; Hope et al., 2008) focused on line-up identification or item recall tasks rather than the implicit attribution of blame. Although eyewitness ability in memory recognition might be related to the process of identifying offenders through a line-up (Wright & Stroud, 2002), this does not provide any insight as to how witnesses may interact with misinformation when attempting to recall an event in their statements. Additionally, whilst other studies which looked at co-witness influence and general memory recall were able to indicate how witnesses could erroneously recall false details about an event in their statements (Hope et al., 2008), very little research had attempted to determine whether this misinformation could influence the way they interpret the event as a whole to attribute blame. Thus the present study attempted to build on the existing literature surrounding memory conformity and eyewitness statements. The present study aimed to measure eyewitness suggestibility by observing the frequencies

of false blame attribution, as well as through the confidence judgements of participants after they had been exposed to misinformation from co-witnesses.

Results indicated that a unanimous misinformation source was a significant predictor of false blame attribution (see Table 6.5). The findings imply that for misinformation to influence an eyewitness's judgement in blame attribution, it must be unanimously presented by all other co-witnesses. Such findings are in agreement with the fundamental models of social conformity, which suggest that a break in the unanimity of misinformation can cause the target to doubt the credibility of the source (Allen & Levine, 1968; Hardy, 1957; Malof & Lott, 1962; and Morris & Miller, 1975). It was also found that participants who had discussed the event with co-witnesses were significantly less likely to be uncertain when making a blame attribution, in comparison to participants who had not engaged in a post-event discussion. Findings therefore suggest that eyewitnesses may seek out external information when uncertain. Additionally, the results imply that uncertain eyewitnesses may be more susceptible to co-witness influence - as suggested by theories on social conformity (Smith, Hogg, Martin, & Terry, 2007). The relationships between group size and blame conformity are investigated and discussed in further detail within Chapter 7.

6.5.1. Gender and co-witness suggestibility in blame attribution

The results showed no significant gender-related differences in blame attribution across all group conditions, with men and women producing similar statements to one another. When analysing the confidence scores of participants who did not conform to the confederate, no significant gender differences were found in the confidence scores of participants who gave correct statements. The results suggest that when controlling for group size and unanimity, men and women show no variation in their susceptibility to co-witness influence during blame attribution. Findings therefore provide support for the previous studies, which argue that no gender-based differences exist within eyewitness suggestibility (Butts et al., 1995; Schwarz, 2013).

The gender similarities in blame conformity could be due to male and female participants possessing similar source monitoring abilities in short term memory. Although some research indicates that women possess greater abilities in the retrieval of information (Seidlitz & Diener, 1998), these findings have mainly been observed for distant memories. Eyewitnesses will often give their statements shortly after witnessing the event. When looking at gender differences in short term source monitoring, research suggests that men and women are likely to perform similarly (Smeets et al., 2006). In the present study, male

and female participants will have been equally as likely to possess similar source monitoring abilities when attempting to reconstruct the event and, thus, would have been equally likely to misattribute the co-witness misinformation as witnessed information. However, this explanation carries an assumption that source monitoring errors would be an integral cause of blame conformity; however, research on blame conformity has suggested that it is actually predominately driven by informational influence (Thorley, 2015).

The present study required participants to recall the event using memory retrieval, however, the findings contradict with multiple previous studies on memory recall which showed that male eyewitnesses were more suggestible than their female counterparts when attempting to recall items from a video (e.g. Eck et al., 2008; Loftus et al., 1992). These differences might suggest that gender differences in eyewitness suggestibility may only exist for tasks that involve general item recall and not for tasks that require participants to both recall an event and explicitly determine who is at fault. This may be due to the different cognitive processes required to complete the differing tasks. When asked to recall items from an event, participants will rely on their memory retrieval abilities to produce the correct answer; a process in which females possess superior capabilities (Seidlitz & Diener, 1998). However, when faced with the task of attributing blame to the correct suspect, participants will also be reliant on their cognitive and moral reasoning abilities (Devine, 2012; Devine, Clayton, Dunford, Seying, & Pryce, 2001). Research has shown that, on average, men and women perform similarly on such cognitive reasoning tasks (Blumenthal, 2005). Therefore, gender similarities in susceptibility to informational influence might explain why male and female participants showed no differences in suggestibility to misinformation when attempting to attribute blame.

Despite the present study's findings, there is still evidence within the previous literature which suggests that female eyewitnesses may be more susceptible to co-witness influence. An artificial limitation of the present study's methodology was that participants were instructed to discuss the event with co-witnesses prior to giving their statements. After real criminal incidents, not all of the witnesses will wish to discuss the event with their co-witnesses (Paterson and Kemp, 2006a). In fact, social psychologists have produced evidence indicating that females are significantly more likely to discuss emotionally-charged events with other people around them (Birditt & Fingerman, 2003; Harshman & Paivio, 1987). Such findings would therefore suggest that, after a real incident, female eyewitnesses could be more likely to engage in a post-event discussion with other co-witnesses, consequently putting them at a higher risk of exposure to misinformation. However, it can be argued that an individual's desire to discuss events with others around them could be different to their desires to discuss a crime with co-witnesses.

6.5.2. Age and co-witness suggestibility in blame attribution

The results indicated that age was not an accurate predictor of co-witness suggestibility in blame attribution. This finding was further evidenced when the analysis showed no age differences in the confidence of participants who answered correctly (after exposure to misinformation). The results lie in agreement with the findings of Gabbert et al. (2003), who found no significant age-related differences in eyewitness suggestibility during memory recall tasks. However, the present study's results contradict those of numerous previous studies which found a relationship between eyewitness age and suggestibility (Gabbert et al., 2004; Klein 1972). Gabbert et al. (2004) found that younger eyewitnesses were more suggestible than their older counterparts when attempting to recall items from a witnessed event. The discrepancies between the findings can be attributed to the different tasks that were incorporated to each study's experimental design, with the present study using a blame conformity task and the other study used a general memory recall task that did not require participants to evaluate the event. As mentioned previously; the additional cognitive functions required to correctly attribute blame (cognitive and moral reasoning) differ significantly to the processes used when recalling miscellaneous items from an event (memory retrieval). Research indicates that the age of an eyewitness can have a mediating effect on how accurately they can recall items from an event (Dodson et al., 2007; Memon et al., 2003), which in turn would suggest that age-related differences will exist in eyewitnesses' susceptibility to informational influence when faced with such tasks. However, research also shows that, when attempting to attribute blame, the age of the individual does not have a significant effect on their reasoning skills (Kuhn, Weinstock, & Flaton, 1994; Weinstock & Cronin, 2002). This would suggest that eyewitnesses of different ages would face the same levels of informational influence from their co-witnesses and, therefore, there would be no age-related differences in their suggestibility when attempting to attribute blame.

The literature on eyewitness memory identifies two main causes for co-witness suggestibility. The first is informational influence; the process of intentionally accepting contradicting information from co-witnesses in an attempt to identify the correct information (French et al., 2011; Gabbert et al., 2003; Williamson et al., 2013). The second is from source monitoring errors; the process of mistakenly attributing post-event information from co-witnesses as witnessed information (Belli, 1989; Cann & Katz, 2005; Tousignant et al., 1986; Patterson et al., 2012). These two causes for eyewitness suggestibility were observed in memory recall tasks; however, it was not clear if both processes had an effect on the

suggestibility of eyewitnesses when attributing blame. Previous research indicates that elderly eyewitnesses are significantly more likely to make source monitoring errors (Ferguson, Hashtroudi, & Johnson, 1992; Glisky, Rubin, & Davidson, 2001; Henkel, Johnson, & De Leonardis, 1998; Memon, Bartlett, Rose, & Gray, 2003). However, the present study failed to find a significant relationship between eyewitness age and suggestibility when attempting to attribute blame. As a result, it can be inferred that eyewitness suggestibility in blame attribution will be predominantly caused by informational influence rather than by source monitoring errors - an assertion that has been supported by previous research on blame conformity (Thorley, 2015).

It must be acknowledged that despite the study's sample containing a significantly large age range (18-82), a review of the means and standard deviations (see Table 6.3) indicates that the majority of the participants will have been relatively young adults ($M=29.95$, $SD= 13.04$). Therefore, it could be argued that the age-related differences observed within the present study were more representative of the differences in eyewitness suggestibility between young adults and middle-aged adults, rather than between adults of all ages. As a result, it can be suggested that age-related differences in co-witness suggestibility between elderly and relatively younger eyewitnesses may still exist despite the present findings failing to identify any significant differences. Further research, incorporating a more diverse sample size, is therefore needed to determine whether elderly eyewitnesses could be more susceptible to co-witness influence during blame attribution.

6.5.3. Misinformation and overconfidence

The present study also examined the confidence scores of participants who incorrectly blamed the wrong suspect as the offender (as suggested by the confederates). This observation was made in order to identify whether participants could get a false sense of overconfidence in their erroneous judgements after encountering similar information from a co-witness.

The results found no significant gender differences in the confidence scores of participants who gave incorrect eyewitness statements. Such findings suggest that men and women may share the same level of confidence when giving incorrect eyewitness statements. The findings are supported by Lundeberg, Fox, and Puncochar (1994). However, other studies — such as Areh (2011) — produced results that contradicts the present study's findings. Areh's study found that men were significantly more confident than women in an eyewitness setting, even when they were incorrect. Discrepancies between

these findings and those of the present study could be due to Areh (2011) using a sample entirely comprised of undergraduate students. Lundeberg et al. (1994) found that gender differences in overconfidence only existed within younger adults (of similar age as undergraduate students). Lirg (1991) discussed age as also having a confounding effect on the relationship between gender and confidence, demonstrating that older men were slightly more confident than women in self abilities. The present study controlled for the covariate of age when observing gender effects on over-confidence by using a more diverse sample, unlike Areh (2011). The insignificant results suggest that the previous findings of gender differences in over-confidence may have been caused by the factor of age acting as a confounding variable, as well as through the use of a biased sample.

The results found no significant age-related differences in the confidence scores of participants who gave incorrect eyewitness statements. This suggests that adult eyewitness of different ages share the same level of confidence when giving incorrect eyewitness statements. The findings contradict with a large proportion of previous research on age and confidence (Cohen & Faulkner, 1989; Crawford & Sankov, 1996; Hansson, Ronnlund, Juslin & Nilsson, 2008). As discussed earlier, one reason for the present study's non-significant findings may be due to the lack of elderly participants within the sample. As a result, the findings are more representative of the age-related differences between young adults and middle-aged adults. Thus, further research, using a larger proportion of elderly participants, would be required to produce a more accurate indication of the relationship between age and eyewitness confidence.

6.5.4. Limitations and directions for future research

As well as the previously highlighted limitation of the age distribution within the present study's sample, there are multiple additional issues that need addressing. Firstly, it must be acknowledged that preliminary analyses indicated that the average age of participants within the control condition was significantly higher in comparison to the other conditions. However, the overall results suggested that the age of participants did not seem to have a significant effect on their responses, thus it is unlikely that slightly higher age of the control participants will have had a confounding effect on the results.

The study attempted to control for the confederates' age and gender by using a diverse selection of confederates randomly assigned to different groups (see Chapter 5). However, the study did not aim to investigate the effects of confederate characteristics on social influence, as this would have required an even more complex sample which would

have incurred significant time constraints. Future research should aim to identify whether own-sex biases can also exist between co-witnesses during co-witness discussions (i.e. whether individuals are more likely to conform to co-witnesses of the same sex). Another variable that was not controlled for or investigated was eyewitness race. This factor could have acted as an extraneous variable, as multiple research studies have found that eyewitnesses are significantly more accurate in remembering faces of people of the same race (Johnson & Fredrickson, 2005; Meissner & Bingham, 2001; Wright, Boyd, and Tredoux, 2003). This own-race bias could therefore affect the accuracy of an individual's statement and the confidence they will have in their judgement; consequently, the race of an individual could have an effect on their level of susceptibility to co-witness influence.

6.5.5. Summary

In summary; the study failed to find any significant age or gender-related differences in co-witness suggestibility. This was attributed to the nature of the task at hand. Blame attribution requires the eyewitness to use cognitive and moral reasoning in order to identify which the guilty suspect. Such abilities have been found to be unrelated to an individual's age or gender. As a result, the age or gender of the eyewitness would not have a mediating effect on their susceptibility to informational influence. In relation to eyewitness confidence; the present findings suggest that exposure to misinformation did not have a significant effect on the confidence of participants.

Chapter 7:

Study 1b: Group Size and Co-Witness Influence.

7.1. Introduction

The majority of previous research on co-witness influence have only studied the effects of post-event discussions on eyewitness pairs (e.g. Gabbert et al., 2003; French et al., 2008; Hope et al., 2008; Kieckhafer & Wright, 2014; Paterson et al., 2009; Roediger et al., 2001). During real criminal events, there will often be more than two eyewitnesses present (Memon, Dalton, Horry, Milne, & Wright, 2016; Paterson & Kemp, 2006a; Skagerberg & Wright, 2008b) — one survey by Paterson and Kemp (2006a) calculated the mean number of eyewitnesses present during a witnessed criminal incident to be 6.77. Furthermore, Cardozo (2009) found that within 38% of 175 cases of misidentification, there were multiple eyewitnesses misidentifying the same innocent individual as the offender, suggesting that many eyewitnesses could encounter misinformation from more than just one co-witness. Failure to study co-witness influence in larger and more realistic group sizes could result in inaccurate inferences being made about the behaviour of real eyewitnesses. Moreover, the generalized findings could cause researchers to produce unrealistic estimations about the prevalence of co-witness influence within real investigations. This is because the theoretical models of social influence suggest that the size of an eyewitness group could have a mediating effect on the risks of co-witness influence (see Chapter 4.5 for discussion of group size and social influence). In particular, Bond (2005) highlighted the significance of the unanimity of misinformation and misinformation size in moderating the level of social influence an individual will be subjected to.

7.1.1. Misinformation size

The risk of informational influence has been shown to be positively correlated with the size of the information source (Bond, 2005). Walther et al. (2002) investigated the relationship between group size (five versus ten) and memory conformity during memory recall tasks, using live confederates. The results suggested that misinformation was more influential when presented by the larger groups (ten). However, this difference was only observed when the task difficulty was low. When the task difficulty was increased (consequently increasing uncertainty), both group sizes had the same level of influence on the participants' responses. The study only compared the effects of co-witness influence

from groups of five and ten witnesses, research suggests that within real criminal incidents it is relatively rare for ten co-witnesses to engage in a co-witness discussion; the number is often much smaller (Paterson & Kemp, 2006a). Therefore, the present study was more interested in comparing the levels of co-witness influence between groups of 2 (as typically measured within the majority of memory conformity studies) to 6 (rounded average eyewitness group size; Paterson & Kemp, 2006a) eyewitnesses. To date, no such research has attempted to make this observation.

7.1.2. Unanimity of misinformation

Theories on informational influence suggest that for misinformation to have a significant influence on the target it must also be unanimously held by the group (Asch, 1955; Baron, et al., 1996). Walther et al. (2002) were able to demonstrate this effect amongst co-witnesses. As well as measuring the effects of misinformation size, the study also measured the effects that a dissenter would have on the majority group's influence. Participants were either exposed to misinformation from a group of co-witnesses with no dissenters present (unanimous majority), or they were exposed to misinformation from a majority group with a dissenter (someone who disagreed with the majority) present. The study found that misinformation presented by a majority group was significantly less influential on an eyewitness's recollection when there were additional dissenters present—The findings were supported by similar results from Mori and Mori (2008). Both studies indicate that the presence of a dissenter would significantly reduce the risks of co-witness influence on eyewitness statements. Walther and colleagues (2012) suggested that a dissenter would provide the individual with an independent view of the event, which could resultantly increase the individual's own confidence in their recollection and reduce their susceptibility to informational influence. Additionally, research suggests that individuals favour supporting information from group members over contradicting information (Jonas et al., 2001). Therefore, it can be suggested that exposure to confirmatory information from an individual source may have more influence on an eyewitness than exposure to contradicting information from multiple sources (as demonstrated by Mori & Mori, 2008). The relationship between unanimity and group influence can also be explained by the frequency-validity principle, which submits that the consistent repetition of a statement can increase its perceived validity (Fiedler, 2000; Hertwig, Gigerenzer & Hoffrage, 1997). In relation to co-witness influence, the theory would suggest that eyewitnesses would be more likely to accept post-event information from a co-witness, if the information was consistently suggested by all group members. In contrast, a break in the unanimity of the

misinformation would evoke an increase in doubt over the reliability of the misinformation (Festinger, 1945), which could resultantly encourage the target to reject it.

7.2. Present study

It was suggested that observations on co-witness influence measured through traditional two-person paradigms may provide an unrealistic estimation of the true risks of co-witness influence within real criminal investigations. Figures indicate that there are often more than two eyewitnesses present during a criminal event (Paterson & Kemp, 2006a). Theories on social influence suggest that the risk of co-witness influence may be significantly greater when the misinformation is presented by such larger groups (Asch, 1955; Bond, 2005). Additionally, research indicates that if the misinformation is not unanimously held by all co-witnesses, the risk of co-witness influence would be significantly reduced (Walther et al., 2002). However, these inferences were based on general models of social psychology; therefore, a more direct observation is needed to accurately determine the relationship between group characteristics (misinformation size and unanimity of misinformation) and co-witness influence. Despite more recent research investigating the relationship between group size and memory recall (see Thorley & Dewhurst, 2009; Walther et al., 2002), no work has attempted to directly measure the effects of group characteristics on blame conformity (the central focus of the present thesis). Therefore, the present study attempted to examine whether the risk of co-witness influence on blame attribution was significantly mediated by misinformation size and group unanimity.

Another measure of co-witness influence which has been neglected by the majority of previous research is the confidence of eyewitnesses in their recollections. Despite suggestions that eyewitness confidence can be influenced through co-witness discussions (both positively and negatively; see Allwood et al., 2006), no existing research has investigated the relationship between group size and eyewitness confidence. Thus, the present study also focused on the confidence of eyewitnesses as a second measure of co-witness influence.

It is suggested that by identifying the relationship between group size and co-witness influence, investigators and practitioners within the legal system would be able to assess the reliability of eyewitness evidence more accurately, by gauging the potential risks of statement contamination.

On the basis of the research findings discussed, it was hypothesised that:

(H1) An increase in misinformation size (0 to 5) would increase the risk of blame conformity.

(H2) The absence of a unanimous majority would significantly reduce the rates of blame conformity.

(H3) There would be a negative correlation between misinformation size and eyewitness confidence in participants who produced correct responses.

(H4) There would be a positive correlation between misinformation size and eyewitness confidence in participants who produced an incorrect response.

7.3. Methodology

7.3.1. Participants

Data from the same sample used in study one-a (chapter 6) was used for the present study. Resultantly, the same participant details discussed in chapter 6.3.1 are applied to the present study's analysis.

7.3.2. Design & procedure

A between-subjects design was employed, with participants being randomly allocated to one of six independent conditions. The conditions varied in relation to the number of true participants and confederates included within each trial (see Table 7.1). The conditions were used to allow the researchers to assess the impact of the two independent variables, majority size and unanimity of misinformation. Majority size was assessed through manipulating the number of confederates present within conditions which had one true participant per group. The majority sizes used within the conditions were none (control group/condition one), one (condition two), two (condition three) and five (condition four). The second independent variable, unanimity of misinformation, was also manipulated between the experimental conditions. With the exception of the control group, participants were either exposed to misinformation from a unanimous majority group of confederates (conditions three and four), one confederate with multiple true participants present (conditions five and six), or from one confederate with no other participants present (condition two). However — as mentioned previously— a caveat of the present study's design is that participants within conditions two and three may have still been subjected to

misinformation from a unanimous group, if the remaining participants had all erroneously provided misleading responses. Despite this risk, statistically it would have been highly likely for at least one dissenter to be present within the majority of the trials in conditions two and three. The variables of participant age and gender were also controlled for throughout the analysis.

As with the previous studies, the same two dependent variables were used to measure co-witness influence. The first dependent variable was the blame attribution of the participants. The second dependent variable used to measure co-witness influence was the confidence of participants in their responses, after encountering misleading information. The main procedure which is discussed in chapter 5.2.3 was implemented within this study

7.3.3. Materials

The closed-circuit television (CCTV) footage of a bar fight (described in chapter 5.2.2) was used as the study's experimental stimulus. The main point of interest within the footage was the indication that the man in the dark green t-shirt had thrown the first punch and not the man in the yellow t-shirt.

7.4. Results

7.4.1. General descriptive data

In the control group (condition one), 44.8% of participants produced a correct response, 34.5% produced an incorrect response, and 20.7% were uncertain. The variance in responses suggested that the experimental task was relatively ambiguous. The mean confidence scores across all conditions ranged from 2.98 to 3.5, suggesting that a large proportion of eyewitnesses faced some level of uncertainty when making their judgements. The high number of 'unsure' responses suggests that the participants will have been less likely to attribute blame through guessing. Means and standard deviations for all variables are presented in Table 7.1 and 7.2, and the correlations between continuous variables are presented in Table 7.3. It must be noted that —as discussed in chapter 6.4— preliminary analyses indicated that the mean age of participants within condition one (control) was significantly higher than the mean age of participants within the remaining conditions. However, study one-a found that the age of the participants was unlikely to have a

confounding effect on their responses. Nevertheless, this limitation was considered during the interpretation and discussion of the present chapter's findings.

Table 7.1. Descriptive statistics for participant responses (N=608)

Condition	True participants	Confederates	Total	Blame attribution			Mean Confidence (S.D)	
				Dark Top	Yellow Top	Uncertain	Dark Top	Yellow Top
1(N=174)	1	0	1	78 (44.8%)	60 (34.5%)	36 (20.7%)	3.01 (1.12)	2.98 (1.07)
2(N=38)	1	1	2	14 (36.8%)	16 (42.1%)	8 (21.1%)	3.43 (.94)	3.31 (1.08)
3(N=94)	1	2	3	19 (20.2%)	61 (64.9%)	14 (14.9%)	3.47 (.97)	3.37 (.97)
4(N=76)	1	5	6	6 (7.9%)	61 (80.3%)	9 (11.8%)	3.17 (.75)	3.41 (.96)
5(N=56)	2	1	3	26 (46.4%)	20 (35.7%)	10 (17.9%)	3.5 (1.03)	3.05 (1)
6(N=170)	5	1	6	80 (47.1%)	61 (35.9%)	29 (17.1%)	3.4 (1.11)	2.92 (1.11)

Table 7.2. Descriptive statistics for conditions in relation to confederate size (N=608).

Confederate Size	Blame attribution			Mean Confidence (S.D)	
	Dark Top	Yellow Top	Uncertain	Dark Top	Yellow Top
0	78 (44.8%)	60 (34.5%)	36 (20.7%)	3.03 (1.11)	2.98 (1.07)
1	14 (36.8%)	16 (42.1%)	8 (21.1%)	3.43 (.94)	3.31 (1.08)
2	19 (20.2%)	61 (64.9%)	14 (14.9%)	3.47 (.97)	3.24 (.92)
5	6 (7.9%)	61 (80.3%)	9 (11.8%)	3.17 (.75)	3.41 (.96)

Table 7.3. Descriptive statistics and correlations for all continuous variables (N=608).

Variables	C ^a	CS	Age
Confidence ^a	1	.09	.04
Confederate size (CS)	.09	1	-.17***
Age	.05	-.17***	1
Means	3.22	1.37	28.95
Standard Deviations	.96	1.52	13.04
Range	1-5	0-5	18-82

Note. . a= missing data for 'unsure' participants were replaced by confidence average score.

Statistical significance: *p < .05; **p < .01; ***p < .001

7.4.2. The effects of confederate size and unanimity on blame conformity

A Multinomial Logistic Regression was used to analyse predictors for an unordered group classification of eyewitness responses: a correct response, an incorrect response, and a response of 'unsure'. Due to the dependent variable consisting of three outcomes, two regressions were conducted: one with incorrect response as the reference category, and one with the correct response as the reference category. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. The analysis shows that the model fit is significant, [$\chi^2(14) = 82.59, p < .001$], indicating that the full models predicted significantly better, or more accurately, than the null model.

The first column in Table 7.4 has the outcome of 'correct response' compared to 'incorrect response' (reference category). The results suggest that the age and gender of the participants had no significant effect on their response. With respect to the group conditions, participants from condition three ($OR=.24$) and four ($OR=.08$) were significantly more likely to produce an incorrect response than those in the control condition. The measures of association were medium to very large, in accordance with Cohen (1988). The effect sizes, calculated using Cohen's d , were $-.79$ and -1.39 , respectively.

The second column in Table 7.4 has the outcome of 'unsure' compared to 'incorrect response' (reference category). The results suggest that the age and gender of the participants had no significant effect on their responses. With respect to the group conditions; participants from conditions three ($OR=.45$) and four ($OR=.28$) were significantly more likely to produce an incorrect response than an 'uncertain' response, when compared to the control group. The measures of association were small to medium, in accordance with Cohen (1988). The effect sizes, calculated using Cohen's d , were $-.44$ and $-.7$, respectively.

The third column in Table 7.4 has the outcome of 'unsure' compared to 'correct response' (reference category). The results suggest that the age and gender of the participants had no significant effect on their statements. With respect to the group conditions; participants from condition four ($OR=3.75$), compared to participants in the control condition, were over three times more likely produce an 'uncertain' response than a correct response. The measure of association was medium, in accordance with Cohen (1988). The effect size, calculated using Cohen's d , was $.73$. Figure 7.1 illustrates the distribution in participant responses in relation to the number of confederates present.

Table 7.4. Multinomial logistic regression predicting eyewitness response accuracy.

Variable	Correct response ^a (N=223)		Unsure ^a (N=106)		Unsure ^b (N=106)	
	SE	OR (95% CI)	SE	OR (95% CI)	SE	OR (95% CI)
Age	.01	1 (.98/1.01)	.01	1.01(.99/1.03)	.02	1.02(1/1.03)
Gender						
Female		1		1		1
Male	.19	1.01 (.7/1.47)	.27	1.33 (.78/2.27)	.24	1 (.63/1.6)
Condition						
1		1		1		1
2	.42	.66 (.29/1.49)	.5	1.04 (.39/2.79)	.51	1.58 (.59/4.28)
3	.32	.24 (.13/.44)***	.38	.45 (.21/.95)*	.42	1.92 (.84/4.37)
4	.47	.08 (.03/.19)***	.42	.28 (.12/.64)**	.57	3.75 (1.22/11.48)*
5	.35	.99 (.5/1.95)	.45	.95 (.39/2.3)	.24	1 (.63/1.6)
6	.25	1 (.62/1.62)	.32	.88 (.47/1.64)	.31	.88 (.49/1.6)

Note. a= Reference group: 'incorrect response' (n=279); b= Reference group: 'correct response' (n=223). OR = Odds Ratio. SE = Standard Error. 95% CI = Confidence Interval. * p<.05. ** p<0.005. *** p<0.001

Within study one-a, the same data set was analysed with the conditions that did not have a unanimous majority group of confederates omitted, to see if it would have an impact on the predictor variables' abilities to predict blame attribution. The results indicated that there were no significant changes in the results — with regard to significant findings and general effect size strengths— after the removal of these conditions (see Table 6.8). Thus, the present analysis did not choose to re-analyse the data sets for the unanimous confederate conditions.

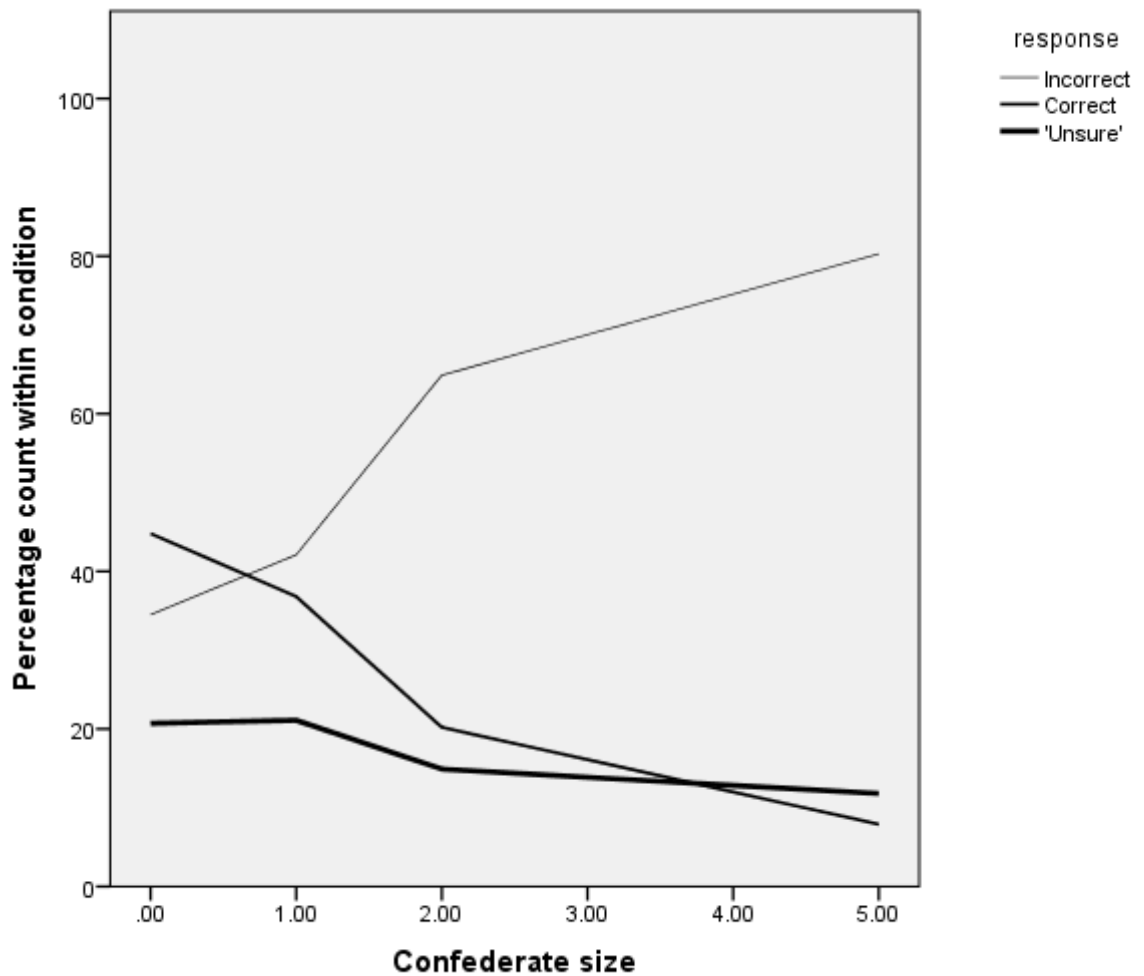


Figure 7.1. Percentage count of participant responses between confederate sizes ($N=608$).

The percentage of correct, incorrect and uncertain responses (dependent variable) for participants who were exposed to misinformation from two and five confederates (independent variable) were compared to determine whether the change in misinformation size influenced response accuracy. A 2 (two or five confederates) X 3 (correct, incorrect or 'unsure' response) chi-square analysis was performed. A weak, significant association was found between the two different groups and eyewitness response accuracy [$\chi^2(2, N = 170) = 6.01, p < .05, \phi_c = .19$]. However, an examination of the standardized residuals revealed that the critical values did not correspond to an alpha of 0.05, suggesting that the difference in responses between the conditions was small.

7.4.3. The effects of confederate size and unanimity on confidence

The confidence judgements of participants who answered correctly and incorrectly were analysed in order to determine whether the group condition influenced the level of confidence that participants placed in their responses (participants who answered 'unsure' were omitted from this analysis, due to their inability to attribute blame). A two-way between groups analysis of variance (ANOVA) was conducted to explore the impact of group condition (6) and the participant's response (2) on their confidence. The interaction between group conditions and response accuracy was not found to be statistically significant [$F(5, 490) = 1.14, p > .05$]. There was no statistically significant main effect for group condition [$F(5, 490) = 1.04, p > .05$]. The main effect for participant response did not reach statistical significance [$F(1, 490) = 1.09, p > .05$]. The results therefore suggest that neither the group condition nor response had any mediating effects on the level of confidence participants placed in their responses.

A second two-way ANOVA was conducted with the conditions that did not have a unanimous majority group of confederates (Conditions five and six) omitted (adjusted $N=315$) omitted, to see if this would have an impact on the relationship between the independent variables and eyewitness confidence. After the removal of conditions five and six, the analysis produced similarly nonsignificant results: The interaction between group conditions and response accuracy was not found to be statistically significant; [$F(3, 307) = .31, p > .05$]. There was no statistically significant main effect for group condition; [$F(3, 307) = 1.66, p > .05$]. The main effect for participant response did not reach statistical significance; [$F(1, 307) = .04, p > .05$]. The results suggest that after removal of conditions five and six, neither the group condition nor response had any effect on the level of confidence participants placed in their responses.

7.5. Discussion

The main purpose of the present study was to determine whether the risk of co-witness influence on blame attribution was significantly mediated by misinformation size and group unanimity. Although the study was not the first to examine the effects of group processes on memory recall (Thorley & Dewhurst, 2007; Walther et al., 2002), very little research had attempted to measure this relationship within a forensic setting. Moreover, the study sought to determine whether the risks of blame conformity were dependent on the

misinformation size and majority consensus, an un-researched area within the eyewitness literature.

7.5.1. Misinformation size and blame conformity

Previous research on social influence indicated that participants would be significantly more vulnerable to being influenced by a majority size of three than by a single individual (Asch, 1955; Campbell & Fairey, 1989; Gerard et al., 1968; Rosenberg, 1961; Stang, 1976), suggesting a positive relationship between majority size and social influence. In relation to memory recall; Walther et al. (2002) found that a majority size of five was as influential as a majority size of ten when the task was ambiguous. The findings suggest that the relationship between majority size and co-witness influence plateaus after a majority size of five was reached. Based on these findings, it was hypothesised in the present study that an increase in misinformation size (0 to 5) would increase the risk of blame conformity to the confederates (H1).

The present study found that an increase in misinformation size supplemented a higher rate of false responses and a decrease in the rate of correct responses, supporting the first hypothesis. More specifically; results indicated that participants who were exposed to misinformation from a majority group of two or five confederates were significantly more likely to produce an incorrect response (misinformation) than a correct or 'unsure' response, when compared with participants from the control conditions (see Table 7.2). As illustrated in Figure 7.1; an increase in misinformation size resulted in fewer 'unsure' responses. An inspection of the odds ratios in Table 7.4 suggests that as the majority size increased, participants who would have been uncertain about the event would have been more inclined to conform and give a false statement. It was also found that participants who were exposed to misinformation from a group of five confederates were over three times more likely ($OR= 3.75$) to give an uncertain response than a correct response, compared to the participants from the control condition. This suggests that some participants were influenced by the confederates, despite not fully conforming to them. Overall, the findings suggest that individuals are more likely to have their memory recollections and subsequent interpretations of the event influenced by co-witnesses, when the information is provided by a larger group

The results concur with earlier research on social influence which showed a greater effect of social influence when the misinformation size was increased (e.g. Asch, 1955; Bond, 2005; Campbell & Fairey, 1989; Gerard et al., 1968; Rosenberg, 1961; Stang, 1976).

These observations can best be explained through the frequency-validity principle, which proposes that an individual would be more likely to perceive information from an external source as being valid, with regards to both reliability and accuracy, if it is expressed by multiple different sources (Fiedler, 2000; Hertwig et al., 1997). The theory would suggest that within the experiments, eyewitnesses who encountered the misinformation from additional co-witnesses (two and five) will have been more likely to accept the misinformation as being correct. Consequently, through informational influence, these participants would have been more inclined to conform to their co-witness's misinformation when attributing blame.

The results also suggested that the rate of false responses was higher when participants were exposed to misinformation from five confederates than by two; however, additional analysis indicated that this difference was small ($\phi_c = .19$). This suggests that the relationship between majority size and blame conformity starts to plateau before reaching a misinformation size of five (see Figure 7.1). This corresponds with the findings of Walther et al. (2002), who showed that when uncertainty was high, an increase in majority size beyond five sources had no additional significant impact on co-witness influence (Walther et al., 2000). This relationship can be attributed to the way in which the participants perceive majority groups; Asch (1952) proposed that after the addition of the third information source, the target would view the group as a collective source of information rather than as individual sources; subsequently the impact of any additional sources would be made redundant.

Interestingly, the results suggested that in the one-versus-one condition, misinformation from an individual confederate did not seem to have a significant influence on the participants' blame attribution. This finding contradicts the majority of previous research on memory conformity, which has typically found that participants can be influenced by a misleading co-witness (Foster et al., 2012; Thorley and Rushton-Woods, 2013). This could be attributed to the ambiguity of the present study. Within the present study, participants will have been aware of the difficulty in attributing blame to the correct person from the footage, due to how suddenly the fight erupted. As a result, the participants will have been more likely to perceive misinformation from an individual source as an erroneous recollection. However, when presented with misinformation from multiple co-witnesses, participants would have been less likely to deem the information as being idiosyncratic and would have been more likely to consider the misinformation as being correct (Asch, 1955).

7.5.2. Unanimity of misinformation and blame conformity

The literature on social influence also identified the unanimity of misinformation as a mediating factor for social influence (Asch, 1955; Bond, 2005; Vandello & Brunson, 1996). Moreover, Walther et al. (2002) also demonstrated that when attempting to recall an incident, an individual's vulnerability to memory conformity was significantly reduced when the misinformation was not unanimously held by the group. Based on these findings, the present study predicted that the absence of a unanimous majority would significantly reduce the rate of blame conformity (H2).

Within three of the experimental conditions, participants were exposed to misinformation from an individual confederate: in condition two, participants were grouped with one confederate; in condition five, participants were grouped with one confederate and another participant; and in condition six, participants were grouped with one confederate and five other participants. The groups were used to assess the level of influence one confederate had on participants, as either the sole information source or a group minority. Results indicated that in all three conditions the confederate had no effect on the participants' responses. The findings suggest that the misinformation was only influential when presented by a unanimous majority group, somewhat supporting the second hypothesis. Self-attention theory (Carver, 1979; Carver & Scheier, 1981) can be used to explain the lack of influence from an individual confederate; Mullen (1987) suggested that the more self-attention was focused on the self, the more an individual would attempt to match their attitudes with majority consensus. However, self-attention would only be evoked when the individual was against a majority norm; thus, misinformation from an individual confederate may have failed to evoke enough self-focus to influence the participant into conforming.

With respect to the literature on group unanimity; the present findings support the propositions of Walther et al. (2002), to an extent. They found that the level of co-witness influence was significantly reduced when there were multiple dissenters present within the eyewitness group. Although the present study did not use dissenters, the results indicated that when multiple true participants were present misinformation from confederates had no influence on the participants. However, the present study did not measure the effects of co-witness influence from majority groups who were not unanimous (multiple true participants present). Consequently, the present findings cannot determine whether eyewitnesses would be vulnerable to co-witness influence from a majority group if the misinformation was not

unanimous. As such, it is suggested that further research is needed in order to fully address the second hypothesis.

7.5.3. Misinformation size, unanimity and confidence

It was predicted that there would be a negative correlation between misinformation size and eyewitness confidence in participants who produced correct responses (H3). Additionally, it was anticipated that there would be a positive correlation between misinformation size and eyewitness confidence in participants who produced an incorrect response (H4). However, the results failed to support either of these hypotheses. Neither group size nor the unanimity of misinformation had a mediating effect on the impact of misinformation to the confidence of participants, contradicting the findings of Allwood et al. (2006). A key difference between the present study and the majority of the previous studies into co-witness influence was that the current study purposely used an ambiguous task, with only 44.8 % of the control group blaming the correct offender and 20.7% answering 'unsure', suggesting that the task was reasonably ambiguous (see Table 7.1). It is suggested that the ambiguity of the task may have significantly affected the confidence of most participants, resulting in the majority of participants displaying some level of doubt in their responses, regardless of their condition or answer. This can be seen in Table 7.1, where the mean confidence scores within all conditions ranges from 2.98 to 3.5.

7.5.4. Implications

The main findings of the present study suggested that for blame conformity to be effective, the eyewitness would have to encounter the misinformation from the majority of co-witnesses. This suggests that the real risks of blame conformity during an investigation might be lower than originally predicted by one-versus-one memory conformity studies. However, research on previous cases of misidentification indicates that in 38% of cases there are more than one eyewitnesses giving the same incorrect statement (The Innocence Project, 2009). As a result, it could be that misinformation from one individual can lead to a snowballing effect on a group of eyewitnesses. Another implication of the findings is that misinformation from co-witnesses might create a notion of uncertainty amongst those who are able to accurately recall the event, leading them to refrain from recalling correct information. This can be seen through the analysis which found that participants were more

likely to state that they were uncertain than give a correct statement as the confederate size increased. This is to be expected, as when giving an eyewitness statement the eyewitnesses are aware of the importance of their statements, and, consequently, there would be a high pressure to perform accurately. The eyewitness would be aware of the negative repercussions of giving misleading information and, as a result, they may only choose report details that they are confident about. Exposure to contradicting information from other co-witnesses could evoke a sense of uncertainty in eyewitnesses and, as a result, could deter them from mentioning certain details (Goodwin et al., 2013). A possible implication for police intervention could be to instruct officers to explicitly encourage eyewitnesses to report any information that they remember seeing, regardless of whether their co-witnesses agreed or disagreed with the recollection. Police officers could specifically ask the witnesses if they remembered witnessing any details that their co-witnesses disagreed with. This would allow the police officers to recover potentially accurate details about the incident that would have otherwise been disregarded by the witness before giving evidence. However, a potential risk with this approach would be that eyewitnesses may be more inclined to report post-event information that may have been misattributed as witnessed information, through source monitoring errors.

7.5.5. Limitations and directions for future research

Although the current paper provided some empirical insight into the social and cognitive processes of co-witness influence, the study bore multiple limitations. The unanimity of misinformation was manipulated by varying the number of confederates and participants within each condition. Multiple participants were used in conditions five and six to cause a divide in judgement during the post-event discussions and break the unanimity of the misinformation. However, based on the response rates in the control condition, there is a small possibility that participants in conditions four and five may have still been exposed to misinformation from a unanimous group of co-witnesses. The unanimity of misinformation could perhaps have been manipulated more effectively using the experimental design outlined by Walther et al. (2002), who manipulated the unanimity of misinformation using dissenters (confederates used to purposely suggest correct information). Further research is therefore needed to reliably determine the importance of group unanimity on co-witness influence. The study failed to measure the effects of co-witness influence from majority group that were not unanimous (i.e. five confederates and two true participants/dissenters); therefore, the present study cannot determine whether misinformation size would still have a mediating effect on co-witness influence if multiple

dissenters were present. Through such observations, future research should seek to determine whether the size or the unanimity of misinformation has a greater moderating effect on co-witness influence.

7.5.6. Summary

Overall, the findings of the present study suggest that the risk of blame conformity amongst eyewitnesses is dependent on the size of the information source. Moreover, results suggest that misinformation from an individual co-witness will most likely be rejected, and that for an eyewitness to be influenced by their co-witnesses the information would have to be presented by the majority of co-witnesses. Based on these observations, it is proposed that the true risks of blame conformity during real criminal investigations may be lower than originally predicted by previous research based on two-person observations. The present study suggests that the risk of possible co-witness contamination is less of a concern if there is clear deviation between the statements of co-witnesses; however, further research is required to allow researchers and practitioners to make accurate predictions about the risks of co-witness contamination within an investigation, based on the group characteristics.

Chapter 8:

Study 2: Personality and Co-witness Suggestibility

8.1. Introduction

8.1.1. Personality correlates of eyewitness suggestibility

Research suggests that an individual's vulnerability to co-witness influence (co-witness suggestibility) may be related to individual differences in personality. Doughty, Paterson, MacCann, and Monds (2017) demonstrated that participants who scored lower on measures of openness, extraversion and neuroticism were significantly more susceptible to memory conformity – when providing a memory report – relative to higher scoring participants. Furthermore, Liebman et al. (2002) displayed a range of personality inventories (NEO OI- Revised; the Multidimensional Personality Questionnaire; Locus of Control; and Memory Efficacy) which could reliably predict the suggestibility of eyewitnesses to misleading questions. More specifically, the study found that eyewitnesses with a high external locus of control, low memory efficacy and neuroticism were significantly more vulnerable to interrogative suggestibility. As discussed earlier (see chapter 4.4), Loftus (2005) identified numerous personality traits that have been frequently found to co-exist with memory suggestibility. These traits include empathy (Tomes & Katz, 1997), self-monitoring (Mullen, 1987), absorption (Platt et al., 1998), and dissociative personality (Eisen & Lynn, 2001; Winograd, Peluso, & Glover, 1998; Qin, Ogle, & Goodman, 2008).

Researchers have also been able to use the interpersonal characteristics of participants to predict their susceptibility to memory conformity. Zhu and colleagues (2010) found that individuals who possessed cooperative and reward dependent personalities were significantly more vulnerable to being influenced by post-event information. Additionally, Wright et al. (2009) found that individuals with high levels of social anxiety were significantly more vulnerable to being influenced by group members during memory recall tasks. The researchers attributed this to increased levels of normative influence exhibited by these individuals, due to their heightened fear of negative evaluation. Wright and colleagues also found that individuals with higher levels of social anxiety were more vulnerable to being influenced by other participant's during memory recall, due to a greater fear of negative evaluation. The present study proposed that the interpersonal characteristics of an eyewitness could be a strong predictor for their susceptibility to co-witness influence, due to previous research indicating that the informational and normative pressures of conformity were heavily mediated by the interpersonal characteristics of the targeted individual

(Cialdini & Goldstein, 2004; Glomb & Liao, 2003; Heerdink, van Kleef, Homan, & Fischer, 2013).

The present study identified the Fundamental Interpersonal Relations Orientation-Behaviour (FIRO-B) as a potentially suitable scale for predicting an individual's susceptibility to co-witness influence during blame attribution (see Chapter 4.4). This was primarily due to the scale's repeated use within research on social conformity (see Huertas & Powell, 1986; Willcoxson & Chatam, 2006). However, to date, no research study has attempted to use the FIRO-B scale to predict an eyewitness's susceptibility to co-witness influence. The ability to identify vulnerable eyewitnesses can have significant benefits within a legal context. Through identifying witnesses who would be at a higher risk of reporting non-witnessed information, jurors and legal professionals would be able to assess the reliability of their statements more accurately. This, in turn, may help reduce the risks of false convictions. In addition, through identifying the underlying causes for co-witness suggestibility, investigators may be able to work on implementing interventions to prevent vulnerable eyewitnesses from reporting unwitnessed information.

8.2. Present study

Although previous research has attempted to identify the relationship between general personality traits and co-witness suggestibility in memory recall, a systematic observation on interpersonal characteristics would provide more reliable predictors of co-witness suggestibility. To date, most research studies on co-witness influence have only considered a singular measure for co-witness influence memory conformity. Whilst observation on memory conformity can allow researchers to clearly determine whether an individual has been influenced by their co-witnesses, such an approach would assume that any participant who did not conform to the misinformation will not have been influenced. However, research has found that eyewitnesses who do not conform to their co-witnesses may still be influenced by the misinformation through a loss of confidence in their reports (Allwood et al., 2005; Luus & Well, 1994). Based on this evidence, it can be argued that by solely relying on a single measure for co-witness influence, such as blame conformity, researchers may underestimate the true prevalence of co-witness influence. Therefore, keeping in line with the present thesis' methodological design, the present study also measured the confidence of eyewitnesses after encountering misleading co-witness information.

The purpose of the present study was to explore the association between an eyewitness's interpersonal characteristics and their susceptibility to co-witness influence (co-witness suggestibility) when attributing blame, whilst controlling for age, gender, and group characteristics (misinformation size and unanimity). The FIRO-B assessment was selected as an appropriate tool for measuring the interpersonal characteristics of the participants due to its extensive use in previous research for identifying interpersonal predictors of group behaviour (see Jones et al., 1981; Naydenova, 2007; Poorman & Seelau, 2001). Additionally, previous research findings suggest that both misinformation size and unanimity of misinformation may have a mediating effect on an individual's vulnerability to co-witness influence, yet very few studies have attempted to control for these variables. Therefore, this effect was controlled for in the present study by conducting trials under multiple different conditions where the number of confederates and true participants present was manipulated.

To date, no research study has attempted to investigate the relationship between the FIRO-B personality traits and co-witness suggestibility, making it difficult to confidently determine the likely direction of the relationships, if any. However; based on the available findings from general research on group conformity (see Huertas & Powell, 1986), the study predicted that:

(H1) participants who scored high on wanted control would be more vulnerable to co-witness influence.

Although Huertas and Powell (date) identified multiple other FIRO-B scales as predictors of conforming behaviour (expressed control, wanted affect and expressed affection), these associations were likely to have been specific to the study's procedure, which is significantly different from the present study's design. Therefore, no additional hypotheses were made with regards to the relationship between the FIRO-B scales and co-witness suggestibility.

8.3. Methodology

8.3.1. Participants

The study recruited five hundred and ninety-nine participants, of which, one hundred and twenty-six participants were randomly selected to play the role of a confederate. As a result, their answers were not included in the data analysis. The remaining experimental sample consisted of 473 participants. Two hundred twenty-four were male (M age= 29.3;

range= 16-70; *SD* = 11.91) and two hundred forty-nine were female (*M* age= 28.58; *range*= 16-80; *SD* = 11.77). The sampling procedure, along with details regarding the preliminary measures for participant suitability are presented in chapter 5.2.1.1. After gaining confirmation for participation, participants were randomly assigned to one of five experimental conditions, whilst ensuring a relatively even distribution of male and female participants within each experimental group. Additional descriptive tests were conducted to ensure that there was a relatively equal distribution of age within all conditions (See Table 8.1).

8.3.2. Measures and Materials

8.3.2.1. Visual Stimulus

The closed-circuit television (CCTV) footage of a bar fight (described in chapter 5.2.2) was used as the study's experimental stimulus. The main point of interest within the footage was the indication that the man in the dark green t-shirt had thrown the first punch and not the man in the yellow t-shirt.

8.3.2.2. Fundamental Interpersonal Relations Orientation-Behaviour (FIRO-B; Schutz, 1958)

The FIRO-B assessment was used as a measure for the participant's interpersonal characteristics. The items are presented as statements about the individual's interpersonal needs (e.g. "people control my actions"), the participant then scored their level of agreement with each statement through a six-point scale (six indicating maximum agreement). Each item is scored dichotomously (zero or one), depending on the participant's level of agreement with the statement (see Appendix 5). The scoring criteria is set out by the FIRO-B Manual and varies between each item. The scores are then totalled to produce six overall scores, ranging from zero and nine (with nine indicating the strongest presence of the interpersonal trait) for each scale.

The six FIRO-B scales were constructed using the Guttman scaling design, which suggests that the scales would possess high levels of reproducibility (Babbie, 2013). Schutz (1978) demonstrated the reliability of the assessment through testing the reproducibility of the scales. As predicted, the results reported suitable reproducibility coefficients for all scales, ranging between .93 and .94. The FIRO-B has also been shown to have adequate

test-retest reliability (Gluck, 1983; Hutcherson, 1965; Schutz, 1978). Schutz (1978) found that after a one-month duration, the test-retest coefficients were as follows: .82 for expressed inclusion, .75 for wanted inclusion, .80 for expressed affection, .73 for wanted affection, .74 for expressed control, and .71 for wanted control. In light of the aforementioned research surrounding the validity of the FIRO-B assessment, despite some of the criticisms received the assessment remains as a reliable predictor for interpersonal characteristics. Based on the primary aim of the present study focusing on the interpersonal correlates of co-witness influence, it was the FIRO-B assessment was determined to be the most appropriate scale for the present study. The validity of the FIRO-B scale has been further evidenced through its repeated — and successful— use on UK-based samples by previous research (see Ditchburn & Brook, 2015; Macrosson & Semple, 2001; Willcoxson & Chatam, 2006), demonstrating its appropriateness for measuring the interpersonal characteristics of the present project's sample. Moreover, Macrosson and Semple (2001) reported good reliability coefficients (*Cronbach CI* .66, *split-half* .55) of the scale and also demonstrated minimal to no interscale correlations between the dimensions.

Using the present study's data, preliminary tests were conducted by the researchers to assess the internal validity of the assessment. A one-way multivariate analysis of variance (MANOVA) was conducted on the mean scores of the FIRO-B scales within each experimental condition. The analysis did produce significant results, $F(24, 1616.42) = 2.21$, $p < .05$; *Wilk's Λ* = .89, *partial η^2* = .03; however, post-hoc observations found that other than the wanted affection scale, the other five scales remained consistent between all experimental conditions— suggesting that five out of the six scales possessed good internal validity.

8.3.3. Design

A mixed design was employed, with participants being randomly allocated to one of five independent conditions. The group conditions were used to manipulate the independent variables of misinformation size (size of the group presenting the misinformation) and unanimity of misinformation, through altering the number of participants and confederates (misinformation source) present during the trials. As Table 8.1 illustrates, the misinformation was guaranteed to be presented unanimously in conditions four and five due to the participant being placed into a confederate-only group. In conditions two and three, the presence of multiple true participants meant that the participants were likely to encounter other dissenters, breaking the chain of unanimity. However, a caveat of the

present study's design is that participants within conditions two and three may have still been subjected to misinformation from a unanimous group, if the remaining participants had all erroneously provided misleading responses. In spite of this risk, statistically it would have been highly likely for at least one dissenter to be present within the majority of the trials in conditions two and three.

Table 8.1. Participant information for each experimental condition.

Condition	N	Group size	True participants	Confederates	Age	
					M	S.D
1 (Control)	171	1	1	0	31.22	13.48
2	56	3	2	1	26.64	8.94
3	170	6	5	1	28.52	10.98
4	38	3	1	2	21.84	3.87
5	38	6	1	5	31.97	12.13

The FIRO-B scores for each six scales were used as predictor variables of co-witness suggestibility. Co-witness suggestibility was measured through two dependent variables: the response given by the participants when asked to identify which man had thrown the first hit (blame attribution), and the level of confidence the participants placed in their response (eyewitness confidence). In line with previous research on eyewitness confidence (see Mudd and Govern, 2004), confidence judgements were measured using a five-point scale (five meaning maximum confidence). Participants who answered "unsure" were not asked to give a confidence rating due to their inability to determine who was to blame.

8.3.4. Procedure

The main procedure which is discussed in chapter 5.2.3 was implemented within this study. However, for this study, participants were asked to complete an additional questionnaire: After being interviewed by the investigator, the participants were instructed to complete a copy of the FIRO-B assessment privately. The participants were asked to complete the assessment after giving their reports about the incident to prevent their awareness of the assessment's questions from affecting their blame attribution responses.

Participants in the control condition watched the footage individually and did not discuss the footage with any co-witnesses. After completing the assessment, participants were debriefed and thanked for their participation.

8.4. Results

The main results are presented in two sections. First, evidence for the relationship between interpersonal characteristics and co-witness suggestibility is given through an analysis of eyewitness blame attribution (the first dependent variable). The second section of the results investigates the relationship between interpersonal characteristics and co-witness suggestibility through analyses of eyewitness confidence (second dependent variable). Means and standard deviations for all variables are presented in Table 8.2, and the correlations between predictor variables are presented in Table 8.3.

Prior to the main analyses, a preliminary one-way between groups analysis of variance was first conducted to determine whether the variable of participant age was similar across all experimental conditions. Participants were divided into five groups according to their allocated group conditions (see Table 8.1). There was a statistically significant difference at the $p < .001$ level in the age of the participants across the five conditions [$F(4, 468) = 6.66, p < .001$]. The difference in mean ages between groups was small. The effect size, calculated using eta squared, was .05. Post-hoc comparisons using the Tukey HSD test indicated that there was a significant difference in mean age between participants from the condition one (control) ($M=31.22, SD= 13.48$) and participants in condition four (1p/2c) ($M= 21.84, SD= 3.87; d=.76$); and between participants from condition three (5p/1c) ($M= 28.32, SD= 11.17$) and condition four ($d=.63$). No other significant differences in mean age were observed between the remaining conditions. The observed differences were considered when interpreting and discussing the results within the discussion.

Table 8.2. Means and standard deviations of FIRO-B scales for all conditions

	N (%)	M Confidence (Std. Dev)	WC		EC		WA		EA		WI		EI	
			M	S.D	M	S.D	M	S.D	M	S.D	M	S.D	M	S.D
Condition 1	171	2.95 (1.1)	4.71	2.58	3.2	2.69	4.91	2.78	4.2	2.11	4.82	3.06	4.86	2.19
Correct	73 (42.7%)	2.9 (1.19)	4.56	2.71	3.52	2.83	4.59	2.71	3.92	1.99	4.97	3.24	5	2.18
Incorrect	58 (33.9%)	3 (1.08)	4.89	2.25	2.86	2.38	5.17	2.87	4.52	2.02	4.69	2.84	4.95	1.99
Unsure	40 (23.4%)	a	4.7	2.85	3.13	2.9	5.1	2.8	4.28	2.43	4.73	3.11	4.48	2.47
Condition 2	56	3.3 (1.03)	4.09	2.6	2.25	2.61	5.77	2.48	4.16	2.33	5.13	3.09	4.96	2.22
Correct	26 (46.4%)	3.5 (1.03)	4.04	2.54	2.38	2.62	5.58	2.76	4.23	1.88	5.04	3.09	5.31	2.35
Incorrect	20 (35.7%)	3.05 (1)	4.1	2.88	2.8	2.95	5.65	2.48	4.3	2.85	5.3	3.03	4.95	2.14
Unsure	10 (17.9%)	a	4.2	2.44	.8	1.03	6.5	1.65	3.7	2.41	5	3.5	4.1	2.02
Condition 3	170	3.19 (1.13)	4.8	2.68	3.16	3.83	5.45	2.54	4.09	2.28	4.92	3.01	4.91	2.36
Correct	80 (47.1%)	3.4 (1.11)	4.24	2.7	3.52	2.83	5.86	2.4	4.29	2.17	5.25	2.91	5.15	2.57
Incorrect	61 (35.9%)	2.92 (1.11)	5.61	2.64	2.61	2.8	5.26	2.5	3.72	2.48	4.64	3.01	4.75	2.05
Unsure	29 (17.1%)	a	4.66	2.41	2.64	2.66	4.61	2.82	4.31	2.12	4.62	3.28	4.58	2.37
Condition 4	38	3.36 (.82)	4.29	2.43	3.95	2.52	5.55	1.88	4.76	1.92	5.92	2.17	5.55	2.27
Correct	4 (10.5%)	3.25 (.5)	3.25	1.5	7	2.16	5.75	2.06	3.25	.96	6.5	2.38	5.25	2.63
Incorrect	29 (76.3%)	3.38 (.86)	4.83	2.11	3.17	2.05	5.48	2.03	5	2.07	5.79	2.29	5.62	2.31
Unsure	5 (13.2%)	a	2	3.46	6	2.65	5.8	.84	4.6	.89	6.2	1.48	5.4	2.3
Condition 5	38	3.41 (1.05)	4.18	2.14	3.55	2.18	4.76	2.2	4.3	2.17	5.55	1.88	5.76	1.68
Correct	2 (5.3%)	3 (1.41)	4.56	2.71	5.5	2.12	4.5	.71	6	1.41	6.5	.71	6.5	.7
Incorrect	32 (84.2%)	3.44 (1.04)	4.09	2.2	3.47	2.14	4.75	2.27	5.28	1.73	5.63	2	5.81	1.64
Unsure	4 (10.5%)	a	5.25	2.06	3.25	2.63	5	2.45	5.75	.5	4.5	.58	5	2.45

Note. a= No confidence scores was recorded for participants who answered "unsure" due to their inability to attribute blame.

Table 8.3. Descriptive statistics, and correlations for all continuous variables (N = 473).

Variables	C ^a	Age	WC	EC	WA	EA	WI	EI
Confidence ^a	1	.05	-.14**	.09*	.01	-.04	.01	.004
Age	.05	1	-.12**	.01	.04	.01	-.03	-.08*
Wanted Control	-.14**	-.12**	1	-.26***	-.09*	.07	-.1*	.06
Expressed Control	.09*	.01	-.26***	1	.07	.05	.19***	.11**
Wanted Affection	.01	.04	-.09*	.07	1	.39***	.42***	.29***
Expressed Affection	-.04	.01	.07	.05	.39***	1	.18***	.28***
Wanted Inclusion	.01	-.03	-.1*	.19***	.42***	.18***	1	.59***
Expressed Inclusion	.004	-.08*	.06	.11**	.29***	.28***	.59***	1
<i>Means</i>	3.12	28.92	4.59	3.16	5.25	4.3	5.04	5.02
<i>Standard Deviations</i>	1.19	11.83	2.58	3.11	2.57	2.17	2.91	2.24
<i>Range</i>	1-5	16-80	0-9	0-9	0-9	0-9	0-9	0-9

Note. a= missing data for "unsure" participants were replaced by confidence average score. Statistical significance: *p < .05; **p < .01; ***p < .001

8.4.1. Predicting eyewitness suggestibility through response accuracy.

8.4.1.1. Control group

The results from the control group (condition one) offer an indication of how well participants performed on the eyewitness task, when no misinformation was presented. Although most participants were able to produce a correct response (42.7%), a large

proportion of the participants blamed the wrong man for throwing the first hit (33.9%), and an additional 23.4% of the participants stated that they were uncertain (See Table 8.2); suggesting that the task difficulty was moderately high. The study purposely used an ambiguous task, due to research suggesting that informational influence is more effective in the presence of uncertainty (Walther et al., 2002).

The results from participants in the control condition were analysed to ensure that the FIRO-B scales had no inherent relationship with general response accuracy. A series of multinomial logistic regressions were used to analyse the relationship between FIRO-B scores and eyewitness blame attribution when no group discussion was permitted. The analysis found that the model fit was not significant, [χ^2 (12, $N=171$) = 8.32, $p > .05$]. The results indicated that there was no relationship between the FIRO-B scales and report accuracy in participants who did not partake in a co-witness discussion. Therefore, any relationships observed between the FIRO-B scales and report accuracy within the experimental conditions could be attributed to co-witness discussions.

8.4.1.2. Investigating the relationship between FIRO-B scores and eyewitness blame attribution.

First, the study wanted to establish whether there were any relationships between the interpersonal characteristics of an eyewitness and their susceptibility to blame conformity, whilst controlling for age, gender and group condition. To investigate these relationships, multinomial logistic regression was used to analyse the effects of the FIRO-B scores and group conditions on the participant's blame attribution. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. Due to the dependent variable consisting of three outcomes, two regressions were conducted: one with the incorrect response (yellow top; misinformation) as the reference category, and one with the correct response (dark green top) as the reference category. The analysis found that the model fit was significant, [χ^2 (24, $N=473$) = 85.28, $p < .001$], indicating that both full models predicted significantly better, or more accurately, than the null model.

The first column in Table 8.4 has the outcome of "correct response" compared to "incorrect response" (reference category). In relation to the experimental conditions; the results suggested that participants who were exposed to misinformation from a unanimous majority group (conditions 4, $OR= .09$; and 5, $OR= .04$) were significantly more likely to report the misinformation (incorrect response) than those in the control condition. The

measures of association were large, in accordance with Cohen (1988). The effect sizes, calculated using Cohen's d , were -1.33 and - 1.77, respectively. The data suggested that exposure to misinformation that was not unanimous (conditions 2 and 3) did not have any effect on the participants' reports. In relation to the FIRO-B scales; the results suggested that participants who scored higher on the wanted control scale ($OR=.89$) were significantly more likely to report the misinformation (incorrect response). However, the measure of association was small, in accordance with Cohen (1988). The effect size, calculated using Cohen's d , was -.06. The data suggested that the remaining FIRO-B scales could not reliably predict the eyewitness's blame attribution.

The second column in Table 8.4 compares the outcome of "unsure" to "incorrect response" (reference category). In relation to the experimental conditions; the results suggested that participants who were exposed to misinformation from a unanimous majority group (conditions 4, $OR= .27$; and 5, $OR= .17$) were significantly more likely to report the misinformation (incorrect response) than those in the control group. The measures of association were medium to large, in accordance with Cohen (1988). The effect sizes, calculated using Cohen's d , were -.72 and - .98, respectively. The data suggested that exposure to misinformation that was not unanimous (conditions 2 and 3) did not seem to have any effect on the participants' responses. The data also suggested that none of the FIRO-B scales could reliably predict the eyewitness's blame attribution.

The third column in Table 8.4 has the outcome of "unsure" compared with "correct response" (reference category). The results suggest that the experimental condition was not a reliable predictor of eyewitness response accuracy. Participants who scored higher on expressed inclusion ($OR=.85$) were significantly more likely to produce a correct response. However; the measure of association was very small, in accordance with Cohen (1988). The effect size, calculated using Cohen's d , was -.09. The data suggested that none of the other scales could reliably predict the eyewitness's blame attribution.

Table 8.4. Multinomial logistic regression predicting eyewitness response accuracy.

Variable	Correct response (N=185)		Unsure ^a (N=88)		Unsure ^b (N=88)	
	SE	OR (95% CI)	SE	OR (95% CI)	SE	OR (95% CI)
Age	.01	.99 (.97/1.01)	.01	1.01(.99/1.03)	.01	1.02(1/1.04)
Gender						
Male	.23	1 (.64/1.56)	.27	1.33 (.78/2.27)	.27	1.33 (.78/2.27)
Female		1		1		1
Condition						
1		1		1		1
2	.36	.98 (.49/2)	.45	.77 (.32/1.33)	.44	.79 (.33/1.85)
3	.25	1.05 (.64/1.72)	.31	.72 (.39/1.33)	.3	.69 (.38/1.24)
4	.58	.09 (.03/.27)***	.55	.27 (.09/.8)*	.72	3.21 (.78/13.12)
5	.76	.04 (.01/.19)***	.56	.17 (.05/.53)***	.9	3.94 (.68/22.97)
Wanted Control	.05	.89 (.81/98)*	.06	.95 (.85/1.05)	.06	1.06 (.95/1.18)
Expressed Control	.04	1.05 (.97/1.14)	.05	1.05 (.95/1.15)	.04	1 (.91/1.09)
Wanted Inclusion	.05	1.01 (.91/1.11)	.06	1.03 (.92/ 1.16)	.06	1.03 (.91/1.16)
Expressed Inclusion	.07	1.06 (.93/1.2)	.08	.9 (.78/1.04)	.07	.85 (.73/.99)*
Wanted Affection	.05	.98 (.88/1.08)	.06	.99 (.87/ 1.12)	.06	1.01 (.89/1.15)
Expressed Affection	.06	.99 (.88/1.11)	.07	1.05(.92/1.2)	.07	1.06 (.93/1.21)

Note. a= Reference group: 'incorrect response' (n=200); b= Reference group: 'correct response' (n=185). OR = Odds Ratio. SE = Standard Error. 95% CI = Confidence Interval. * p<.05. ** p<0.005. *** p<0.001

A second test of multinomial logistic regression was conducted with the conditions that did not have a unanimous majority group of confederates (Conditions two and three) omitted (adjusted N= 247), to see if this would have an impact on the predictor variables' abilities to predict blame attribution. The analysis found that the model fit was significant [$\chi^2(20) = 70, p < .001$], which indicated that the full model predicted significantly better, or more accurately, than the null model. As shown in Table 8.5, the new analysis suggested

that the wanted control and expressed inclusion scales were no longer significant predictors of blame attribution, after the removal of conditions two and three ($p > .05$). With regard to the remaining predictor variables, the new analysis found no significant changes in the results — in relation to significant p -values and general effect size strengths— after the removal of conditions two and three.

Table 8.5. Multinomial logistic regression predicting eyewitness response accuracy.

Variable	Correct response (N=79)		Unsure ^a (N=49)		Unsure ^b (N=49)	
	SE	OR (95% CI)	SE	OR (95% CI)	SE	OR (95% CI)
Age	.01	.98 (.96/1.01)	.01	1(.97/1.03)	.02	1.02(.99/1.05)
Gender						
Male	.35	.86 (.44/1.7)	.37	1.49 (.72/3.08)	.39	1.73 (.8/3.7)
Female		1		1		1
Condition						
1 (control)		1		1		1
4 (1p/2c)	.6	.08 (.02/.25)***	.57	.24 (.08/.7)*	.73	3.1 (.73/13.05)
5 (1p/5c)	.77	.05 (.01/.22)***	.59	.18 (.06/.58)**	.91	3.79 (.64/22.937)
Wanted Control	.07	.95 (.83/1.09)	.08	.96 (.83/1.11)	.08	1.01 (.87/1.18)
Expressed Control	.07	1.14 (1/1.3)	.05	1.05 (.95/1.15)	.07	.97 (.84/1.12)
Wanted Inclusion	.07	1.05 (.91/1.21)	.08	1.03 (.88/ 1.2)	.08	.98 (.84/1.15)
Expressed Inclusion	.09	1.01 (.84/1.21)	.1	.88 (.72/1.07)	.11	.87 (.71/1.07)
Wanted Affection	.08	.95 (.82/1.1)	.08	1.04 (.88/ 1.21)	.09	1.09 (.92/1.28)
Expressed Affection	.09	.88 (.73/1.05)	.1	.97 (.8/1.18)	.1	1.11 (.9/1.35)

Note. a= Reference group: 'incorrect response' (n=119); b= Reference group: 'correct response' (n=79). OR = Odds Ratio. SE = Standard Error. 95% CI = Confidence Interval. * $p < .05$. ** $p < 0.005$. *** $p < 0.001$

8.4.2. Predicting eyewitness suggestibility, through eyewitness confidence

For the second part of the results, the confidence judgements of participants who answered correctly and incorrectly were analysed to determine whether exposure to co-witness misinformation influenced the level of confidence that participants placed in their responses. In addition, whether the relationship between co-witness misinformation and eyewitness confidence could be predicted by the interpersonal characteristics of the individual was assessed. No significant correlations were observed between the FIRO-B scores and eyewitness confidence within the control condition. Therefore, any observed relationships between the variables within the experimental conditions could be attributed as an effect of the co-witness discussion.

8.4.2.1. Eyewitness confidence in correct responses

Hierarchical multiple regression was performed to investigate the ability of the FIRO-B scales as predictors of eyewitness confidence (dependent variable) in participants who did not conform to the confederates. The variables of group condition, as well as participant age and gender, were also controlled for. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, and homoscedasticity.

In the first step of hierarchical multiple regression, the controlled variables (group condition, age and gender) were entered. This model was not statistically significant [$F(3, 108) = .81; p > .05$], and explained 2.2% of variance in confidence scores (see Table 8.6), suggesting that none of the variables were related to confidence scores. After entry of FIRO-B scores at step 2, the total variance explained by the model as a whole was 19% [$F(9, 102) = 2.66; p < .01$]. The introduction of the FIRO-B scores explained an additional 17% of variance in confidence [$R^2 \text{ Change} = .17; F(6, 102) = 3.52; p < .005$]. In the final adjusted model, one out of six predictor variables were statistically significant (wanted control; $r = -.36$), with a Beta value of ($\beta = -.27, p < .05$). The measure of association was medium, in accordance with Cohen (1988). The effect size, calculated using Cohen's d , was $-.56$.

Table 8.6. Hierarchical Regression Model of eyewitness confidence for correct responses.

	R	R ²	R ² Change	B	SE	β	t
Step 1	.15	.02					
Age				.01	.01	.13	1.35
Gender				.04	.2	.02	.22
Condition				-.13	.18	-.07	-.73
Step 2	.44	.19	.17**				
Age				.01	.01	.05	.55
Gender				.17	.2	.08	.85
Condition				-2.3	.18	-.12	-.29
Wanted Control				-.11	.04	-.27*	-2.58
Expressed Control				.08	.04	.22	2
Wanted Affection				.03	.05	.07	.62
Expressed Affection				-.02	.05	-.04	-.42
Wanted Inclusion				-.03	.05	-.09	-.64
Expressed Inclusion				.06	.06	.15	1.14

Note. Statistical significance: * $p < .05$; ** $p < .01$; *** $p < .001$

A second test of hierarchical multiple regression was conducted with the conditions that did not have a unanimous majority group of confederates (Conditions two and three) omitted (adjusted $N = 79$), to see if this would have an impact on the predictor variables' abilities to predict eyewitness confidence in correct responses.

In the first step of hierarchical multiple regression, the controlled variables (group condition, age and gender) were entered. This model was not statistically significant [$F(3, 78) = .13$; $p > .05$], and explained .5% of variance in confidence scores (see Table 8.7), suggesting that none of the variables were related to confidence scores. After entry of FIRO-B scores at step 2, the total variance explained by the model as a whole was 2.4% [F

(9, 78) = .19; $p > .05$]. The introduction of the FIRO-B scores explained an additional 1.9% of variance in confidence [R^2 Change = .19; $F(6, 69) = .23$; $p > .05$]. In the final adjusted model, none of the variables were statistically significant.

Table 8.7. Hierarchical Regression Model of eyewitness confidence for correct responses.

	R	R ²	R ² Change	B	SE	β	t
Step 1	.07	.01					
Age				.001	.01	.03	.28
Gender				.06	.28	.02	.2
Condition				.08	.15	.06	.5
Step 2	.16	.03	.02				
Age				.01	.01	.06	.48
Gender				.13	.31	.06	.42
Condition				.05	.16	.04	.34
Wanted Control				.01	.06	.01	.09
Expressed Control				.02	.06	.05	.36
Wanted Affection				-.04	.06	-.09	-.62
Expressed Affection				.01	.08	.02	.13
Wanted Inclusion				.01	.05	.02	.13
Expressed Inclusion				.05	.08	.09	.65

8.4.2.2. Eyewitness confidence in incorrect responses

A hierarchical multiple regression analysis was then conducted on participants who produced incorrect responses, to investigate the ability of the FIRO-B scales as predictors of eyewitness statement confidence in participants who reported the misinformation (false blame attribution).

In the first step of hierarchical multiple regression, the controlled variables (group condition, age and gender) were entered. This model was not statistically significant [$F(3, 138) = 2.21$; $p > .05$], and explained less than 4.6% of variance in confidence scores (see

Table 8.8), suggesting that none of the variables were related to confidence scores. After entry of FIRO-B scores at step 2, the total variance explained by the model as a whole was 11.7% [$F(9, 132) = 1.94; p > .05$]. The introduction of interpersonal characteristic scores explained an additional 7% of variance in confidence [$R^2 \text{ Change} = .07; F(6, 132) = 1.77; p > .05$]. In the final adjusted model, one out of six predictor variables were statistically significant (wanted control; $r = -.24$), with a Beta value of ($\beta = -.24, p < .05$). The measure of association was small, in accordance with Cohen (1988). The effect size, calculated using Cohen's d , was $-.49$.

Table 8.8. Hierarchical Regression Model of eyewitness confidence for incorrect responses.

	R	R ²	R ² Change	B	SE	β	t
Step 1	.21	.05					
Age				.01	.01	.05	.64
Gender				-.19	.18	-.09	-1.09
Condition				.19	.09	.18*	2.16
Step 2	.34	.12	.07				
Age				.001	.01	-.002	-.02
Gender				-.15	.18	-.07	-.83
Condition				.16	.09	.15	1.66
Wanted Control				-.1	.04	-.24**	-2.65
Expressed Control				.04	.04	.09	1.04
Wanted Affection				-.05	.04	-.12	-1.2
Expressed Affection				-.003	.04	-.01	-.08
Wanted Inclusion				-.02	.04	-.05	-.43
Expressed Inclusion				-.001	.05	.001	.01

Note. Statistical significance: * $p < .05$; ** $p < .01$; *** $p < .001$

A second test of hierarchical multiple regression was conducted with the conditions that did not have a unanimous majority group of confederates (Conditions two and three) omitted (adjusted $N = 119$), to see if this would have an impact on the predictor variables' abilities to predict eyewitness confidence in incorrect responses.

In the first step of hierarchical multiple regression, the controlled variables (group condition, age and gender) were entered. This model was not statistically significant $F(3, 118) = 1.62; p > .05$, and explained 4% of variance in confidence scores (see Table 8.9), suggesting that none of the variables were related to confidence scores. After entry of FIRO-B scores at step 2, the total variance explained by the model as a whole was 6.1% [$F(9, 118) = .78; p > .05$]. The introduction of the FIRO-B scores explained an additional 2.1% of variance in confidence [$R^2 \text{ Change} = .21; F(6, 109) = .39; p > .05$]. In the final adjusted model, none of the variables were statistically significant.

Table 8.9. Hierarchical Regression Model of eyewitness confidence for incorrect responses.

	R	R ²	R ² Change	B	SE	β	t
Step 1	.2	.04					
Age				-.002	.01	-.03	-.29
Gender				-.01	.01	-.01	-.05
Condition				.11	.05	.19*	2.1
Step 2	.24	.06	.21				
Age				-.004	.01	-.05	-.47
Gender				-.01	.2	-.01	-.01
Condition				.11	.06	.19	1.85
Wanted Control				-.04	.05	-.08	-.8
Expressed Control				-.01	.05	-.03	-.27
Wanted Affection				-.04	.04	-.09	-.9
Expressed Affection				.01	.05	.02	.23
Wanted Inclusion				-.01	.04	-.04	-.33
Expressed Inclusion				-.02	.05	-.03	-.3

Note. Statistical significance: * $p < .05$; ** $p < .01$; *** $p < .001$

8.5. Discussion

The purpose of the present study was to explore the association between an eyewitness's interpersonal characteristics and their susceptibility to co-witness influence

(co-witness suggestibility) when attributing blame, whilst controlling for age, gender, and group characteristics (misinformation size and unanimity). The FIRO-B scales of wanted and expressed control, affection, and inclusion were examined to determine their abilities to predict blame conformity and eyewitness confidence (measures of co-witness suggestibility). When observing both measures in the control group (no group discussion), there were no significant relationship between the personality scale scores and conforming behaviour; therefore, any differences in the experimental groups could be attributed to the group discussion. The analysis indicated that only two out of the six, FIRO-B scales were significantly related to co-witness suggestibility; wanted control and express inclusion.

8.5.1. FIRO-B and blame conformity

8.5.1.1. Wanted control

Based on the findings of Huertas and Powell (1986), the present study predicted that participants who scored highly on the wanted control scale would be more vulnerable to co-witness influence (H1). The results indicated that, after encountering co-witness misinformation, participants who scored higher on the wanted control scale were more likely to report the misinformation in their statements (see Table 8.4). In contrast, no such relationship between wanted control scores and incorrect responses existed within the control condition, suggesting that individuals who scored higher on the wanted control scale were more likely to be influenced by their co-witnesses into producing an erroneous blame attribution, thereby supporting the first hypothesis.

Although the present study was the first to use the FIRO-B assessment in predicting co-witness suggestibility, previous studies have identified strong relationships between eyewitness suggestibility and other personality traits related to wanted control. A similar experiment by Liebman and colleagues (2002) found that participants with a high external locus of control were more vulnerable to being misled by their co-witnesses when recalling the event (Liebman et al., 2002). Concurrently, individuals who score highly on the wanted control scale were shown by Stimpson and Maughan (1978) to be more likely to exhibit a significantly higher external locus of control. Based on the co-existing relationship between these two traits, the present research postulated that eyewitnesses with high wanted control may have been more susceptible to accepting misinformation from co-witnesses, due to their persistent reliance to external forces in determining their decisions. Further, Doughty et al. (2017) found that introverted participants were more susceptible to incorporating misinformation from co-witnesses into their memory reports. Although the

FIRO-B assessment does not directly measure an individual's level of introversion, individuals with high wanted control display similar personality traits to introverts - namely; both introverts and individuals with a high level of wanted control tend to be submissive in nature (Gilbert & Allan, 1994; Schutz, 1958). Submissive individuals can be at a higher risk of conforming due to being more susceptible to both informational and normative influence. The relationship between submissive personality and informational influence can be explained by behaviours synonymous with submissiveness. Submissive behaviour can be indirectly linked to low levels of self-confidence, through its strong association with introversion (Gilbert & Allan, 1994; Pulford & Sohal, 2006). This relationship is evident in the present study, with wanted control being negatively correlated with low self-confidence (see Table 8.3). An individual's acceptance of the judgement of others is highly dependent on their self-confidence in the task at hand, due to informational influence being more affective on uncertain individuals (Deutsch & Gerard, 1955; Di Vesta, 1959; Kaplan, 1987). Therefore, individuals who score higher on the wanted control dimension are more likely to lack self-confidence in their judgements and, as a result, they will be more susceptible to conforming to co-witnesses through informational influence. In relation to normative influence; individuals with submissive personalities are more likely to exhibit perceptions of inferior social rank or status and thus are more likely to conform to those that they perceive as being more powerful (Gilbert, 1993). Moreover, submissive behaviour can be used by individuals as a form of fight or flight defence (Bailey, 1987; Harper, 1985; MacLean, 1990). When in conflict with another person, a submissive individual may choose to conform to the views of others in an attempt to avoid the escalation of conflict (Allan & Gilbert, 1987). Therefore, individuals who score highly on the wanted control scale would be more likely to conform to the judgements of co-witnesses to prevent the eruption of any conflict. However, due to the present study interviewing the eyewitnesses individually and privately, eyewitnesses would have been unaware of each other's statements and, thus, there would have been no threat of group conflict. Due to the reduction of normative influence within the experimental paradigm, it is suggested that the relationship between co-witness suggestibility and wanted control was predominantly due to participants exhibiting low levels of confidence, which -in effect - would have increased their susceptibility to informational influence. Additionally, it can also be inferred that rebellious individuals (those who score low on wanted control, in accordance to Schutz, 1958) would therefore be significantly less susceptible to blame conformity.

Although previous research can offer some explanation for the relationship between wanted control and co-witness suggestibility, it must be acknowledged that the relationship between wanted control and co-witness suggestibility within the present study was weak (in accordance with Cohen, 1988). Given the very small effect size measured between wanted

control and co-witness suggestibility, the implications of the observed relationship between wanted control and co-witness suggestibility should be interpreted cautiously.

8.5.1.2. Expressed inclusion

The results also suggested that eyewitnesses with higher needs for expressed inclusion were more likely to be correct in their reports than to be unsure, after exposure to co-witness misinformation (see Table 8.4). However, once again, the effect size for this relationship was very small and the relationship was not found when comparing uncertain responses to incorrect responses. Therefore, it is suggested that this unexpected finding may have been a statistical artefact.

However, it is proposed that a high wanted inclusion score could still increase an eyewitness's chance of being influenced by co-witnesses, despite the results failing to indicate this. This is because an artificial limitation of the present study's methodology was that participants were instructed to discuss the event with co-witnesses prior to giving their statements. In reality, there is no guarantee that all eyewitnesses will wish to discuss the event with co-witnesses. Paterson and Kemp (2006a) found that 44% of previous eyewitnesses had chosen to engage in a post-event discussion with co-witnesses in an attempt to inform them about their knowledge of the event. Research indicates that individuals with a higher need for expressed inclusion would be more motivated to engage in such interpersonal communication (Rubin, Perse, & Barbato, 1988). Therefore, eyewitnesses with a higher need for expressed inclusion would be more likely to engage in post-event discussions. Such findings would therefore suggest that, in a natural eyewitness setting, eyewitnesses with higher needs for expressed inclusion may be more susceptible to co-witness influence due to being at a higher risk of encountering co-witness misinformation. Additionally, it can also be argued that these individuals may also be more likely to expose their co-witnesses to post-event information.

8.5.1.3. Analysis the data for unanimous confederate conditions

The relationship between the predictor variables and participant responses were re-analysed with the conditions that did not have a unanimous majority group of confederates (Conditions two and three) omitted (adjusted $N= 247$). The reanalysis suggested that the wanted control and expressed inclusion scales were no longer significant predictors of blame attributions when exclusively looking at participants who had been subjected to the

misinformation from all of their co-witnesses. This change in results could be due to the increased level of informational influence (as a result of the misinformation being presented unanimously) causing the majority of the participants within the unanimous confederate conditions to make a false blame attribution (76.3% in condition four & 84.2% in condition five). As demonstrated in Table 8.4., the group condition had a stronger effect on participant responses than any of the FIRO-B scales. Thus, it is proposed that the effect a unanimous majority will have made the effects of wanted control and expressed inclusion redundant— with the majority of participants producing a false blame attribution, regardless of their need for wanted control or expressed inclusion.

8.5.1.4. Insignificant relationships between co-witness suggestibility and the remaining scales

The results indicated that expressed control scores could not reliably predict the participants' blame attributions (blame conformity). The inability to find a significant relationship between these variables suggested that expressed control was not related to conforming behaviour, contradicting the results of Huertas and Powell (1986). The contradiction between the results can be attributed to the differences between the studies' methodologies. As mentioned previously, the experiment of Huertas and Powell (1986) used an experimental paradigm where there was an appointed leader. The role of the leader was to be assertive and instruct the other group members on what decisions to make. Such behaviours are synonymous with the descriptive schema of individuals who score highly on expressed control (Shutz, 1958). Essentially, individuals who scored high on the expressed control dimension would have been attracted to gaining the position of leader. With normative influence being significantly stronger on individuals with a higher need for group acceptance, it can be theorized that individuals with high levels of expressed control were more likely to conform to group members as a way of gaining their approval to become the group leader (Louis, Taylor & Douglas, 2005). However, within the confines of an eyewitness paradigm, there is no role of leadership available, thus no reason for participants with high levels of expressed control to want to conform other co-witnesses.

The findings of the present study also indicated that wanted affection and expressed affection were not significantly related to co-witness suggestibility, once again contradicting the findings of Huertas and Powell (1986). These differences can again be attributed to the different methodologies utilised by the studies. Huertas and Powell's experimental paradigm made participants state their answers within the presence of other group members. As a result, an individual with higher scores on both wanted affection and expressed affection

dimensions could give a conforming answer in order to get closer to the group members. In contrast, the present study made participants give their answers privately, preventing participants from displaying their affection to group members or attempting to gain affection from them through their answers. As a result, wanted affection and expressed affection scores were unable to successfully predict for co-witness influence in an eyewitness setting. The study also failed to find any significant relationship between wanted inclusion scores and blame conformity. This was perhaps unsurprising, as there were no existing studies suggesting that the two variables would be related.

8.5.2. FIRO-B and eyewitness confidence

The analysis of eyewitness confidence identified a negative relationship between wanted control scores and eyewitness confidence in eyewitnesses who produced both incorrect and correct responses. However, this relationship was not present for participants within the control condition, suggesting that exposure to co-witness discussions had a negative impact on the confidence of eyewitnesses with high wanted control— suggesting that participants with higher levels of wanted control were more susceptible to having their confidence influenced by co-witnesses, adding further support to the study's hypothesis. The results suggest that eyewitnesses with high wanted control scores were more influenced by disconfirming statements than by conforming statements. Again, this behaviour can be attributed to the submissive nature of participants with high wanted control. Witnesses with submissive personalities tend to exhibit low levels of self-esteem (Gilbert & Allan, 1994; Pulford & Sohal, 2006). Consequently, individuals with low self-esteem would have more difficulty in gaining confidence through confirmatory feedback (McFarlin & Blascovich, 1981), but would still be more vulnerable to losing confidence from disconfirmatory feedback compared to individuals with higher self-esteem (Young, 2000). However, it is suggested that further, more direct, research is needed to support the proposed relationship between wanted control and confirmatory/disconfirmatory feedback.

Interestingly, when the confidence scores were reanalysed with the conditions that did not have a unanimous majority group of confederates (Conditions two and three) omitted, the results found no significant relationship between wanted control scores and eyewitness confidence. The findings suggested that wanted control scores could not predict the confidence scores of participants who were placed in confederate-only groups. One explanation for this insignificant finding could be that submissive participants (with high levels of wanted control) in the confederate-only groups will have been less likely to have

their responses questioned and criticised by their co-witnesses because the confederates were not instructed to challenge the participants or criticise them— they were only instructed to present an incorrect judgement. However, in the conditions where multiple participants were included in each group, participants will have been likely to challenge each other as well the confederates and thus, certain individuals may have been more likely to lose confidence in their own judgements.

8.5.3. Group size

The results also suggested that misinformation size had a moderating effect on blame conformity, with the results indicating that participants who were exposed to misinformation by a larger group were more likely to produce the same erroneous response. The analyses also suggested that exposure to misinformation that was not unanimously held by all co-witnesses (conditions 2 and 3) did not seem to have any significant effect on memory conformity. However, the rates of incorrect responses were significantly higher when participants were exposed to misinformation from a unanimous majority (conditions four and five), suggesting the unanimity of misinformation also had a significant effect on blame conformity. The relationship between group size and co-witness suggestibility is investigated and discussed in chapter 7.

8.5.4. Implications of results

Overall, the results indicated that certain personality factors (high need for wanted control) could leave eyewitnesses pre-disposed to having their memory recollections and blame attributions for an event influenced by others. The findings highlight the need for interventions for raising awareness of the individual differences that can have a negative influence on eyewitness statements. Certain situational factors, such as intoxication, intellectual disabilities and personal biases, are often made aware to investigators and jurors, and these factors can influence how the statements are evaluated with regards to their accuracy and reliability (Evans & Compo, 2010; Schmechel, O'Toole, Easterly, & Loftus; Stobbs & Kebbell, 2003). However, the remaining eyewitnesses who do not fall under such criterion are assumed to be relatively equal with regards to memory recall accuracy and reliability. By raising awareness of the significant effects of personality differences on eyewitness statements, both jurors and investigators would be provided with

an additional tool for evaluating the reliability of eyewitness evidence. Again, that Wanted Control scores should not act as definitive measure of eyewitness statement reliability is stressed, as by doing so jurors and investigators would be at risk of discarding vital accurate evidence. Instead, it is argued that such personality characteristics can offer additional detail for consideration when assessing a crime.

It is concluded that eyewitnesses with high wanted control will be more susceptible to co-witness influence because of their increased level of self-consciousness and lack of self-confidence, making them more prone to informational influence. Self-attention theory states that self-consciousness is escalated when an individual perceives their self as standing out from a group of individuals (Mullen, 1983). This perceived differentiation from a group could be due to differing judgements of a witnessed event, and the heightened level of self-focus can influence an individual to conform to the group (Bond, 2004). Therefore, it is suggested that by ensuring that an eyewitness is completely separated from the other co-witnesses when giving a statement, police investigators could potentially reduce the risk of co-witness conformity and false statements. These methods of police intervention have yet to be scientifically tested and validated, and thus - at this present time - act as informed suggestions for policing professionals. Such implications have been made on the presumption that the eyewitness would be conforming to a co-witness through social influence. However, as discussed in Chapter 3; eyewitnesses can incorporate co-witness information through source monitoring errors as well. In such situations, the aforementioned intervention techniques would likely be ineffective.

Research indicates that jurors would be less likely to perceive an eyewitness's testimony as being reliable if the witness lacked confidence (Brewer and Burke, 2009). However, the present study demonstrated that participants with high levels of wanted control could display low levels of confidence after engaging in a post-event discussion, regardless of whether their report was accurate or not. Consequently, a risk within legal investigations is that accurate eyewitness testimonies could be disregarded by jurors, if the eyewitness possess high levels of wanted control. Resultantly, legal practitioners should attempt to inform jurors on the risks of using eyewitness confidence as a measure of accuracy, especially if the eyewitness had been exposed to co-witness information.

The contradictions between the present study's results and previous research that incorporated differing methodologies highlight the importance of the need for context specific research experiments in the field of eyewitness influence. Previous research had attempted to identify personality characteristics related to conforming behaviour using the FIRO-B assessment (see Huertas & Powell, 1986). However, the study observed conforming behaviour in an occupational setting rather than an eyewitness setting and, therefore, the

results could not be used to make confident inferences about conformity in an eyewitness setting. As predicted, contradictory findings suggest that the causes of conforming behaviour are depend on the situational context.

8.5.5. Limitations and directions for future research.

The study is the first in the literature to examine the interpersonal correlates of co-witness suggestibility, but – indubitably - there were limitations. The FIRO-B questionnaire has come under criticism for its supposed lack of construct validity (Ryan et al., 1970). More specifically; Mahoney and Stasson (2005) emphasised the assessment’s inability to distinctly differentiate between the affection and inclusion dimensions. Failure to distinguish between the two dimensions suggests that the FIRO-B assessment may have failed to accurately measure the characteristics of affection and inclusion; however, a test of multicollinearity on the present data indicated that the two different dimensions did not measure the same variable. Furnham (1990) investigated the feasibility of faking the FIRO-B assessment to gain a desirable personality score. He found that participants could manipulate their answers to score highly on desirable personality traits and score lower on undesirable personality traits. The findings indicate that some participants within the present study may have answered the assessment untruthfully, due to an inherent social desirability effect. Such criticisms of the FIRO-B assessment suggest that a more validated assessment may help produce a more accurate measurement for the relationship between salient personality traits and co-witness suggestibility.

The relationship between wanted control and co-witness suggestibility suggests that self-confidence and perceived social rank may be key mediators for this form of informational influence (Deutsch & Gerard, 1955; Di Vesta, 1959; Gilbert, 1993; Kaplan & Miller, 1987). It can be inferred that by observing these characteristics directly, researchers may be able to develop a more reliable measure for predicting co-witness suggestibility. The Rosenberg Self-esteem Scale (Rosenberg, 1965) has been validated as a reliable measure (McKay, Boduszek, & Harvey, 2014). A fruitful direction for future research would therefore be to utilise such scales in conjunction with the wanted control dimension, to compose a more appropriate assessment for predicting co-witness suggestibility.

In relation to the experimental design; there were some limitations with the way that the unanimity of misinformation was manipulated. The inclusion of multiple participants, against one confederate, was used in conditions two and three to break the unanimity of the misinformation. However, based on the response rates in the control condition (i.e. 33.9%

producing a false response); it is likely that some of the participants in the group discussions will have also reported misinformation. Therefore, there will have been a small possibility that participants in these conditions may have still been exposed to misinformation from a unanimous group of co-witnesses. Future research could manipulate the unanimity of misinformation more reliably by adopting the experimental design used by Walther et al. (2002). In their study, Walther and colleagues manipulated the unanimity of misinformation by using confederate dissenters (confederates used to purposely suggest correct information). The preliminary analyses also suggested that the mean age of participants from condition four was significantly lower than the mean ages of participants from conditions one (control) and three. However, as identified in study one-a (chapter 6), the age of the participants did not seem to have a confounding effect on their responses and the present study controlled for the covariate of age. Thus, the variance in mean age between the conditions will have been unlikely to have a moderating effect on the results.

8.5.6. Conclusion

The FIRO-B assessment, on the whole was not an accurate predictor for co-witness suggestibility, with only one of the dimensions demonstrating consistent accuracy. Nevertheless, alone, the wanted control dimension was accurate in predicting co-witness suggestibility through memory conformity and eyewitness confidence. This relationship is attributed to the submissive nature of eyewitnesses with higher needs of wanted control, rendering them more susceptible to informational influence. The findings demonstrate that co-witness suggestibility can be predicted through interpersonal characteristics; however, it is proposed that a more accurate measure of interpersonal characteristics could allow researchers to make more reliable predictions of an eyewitness's vulnerability to co-witness influence.

Chapter 9:

Study 3: The Effects of Co-Witness Familiarity on Blame Conformity

9.1. Introduction

Despite the previous literature concordantly stating that co-witness discussions can influence individual statements, most of these studies incorporated experimental designs where the participants were strangers to one another, or failed to control for the variable as a whole, with investigators failing to ask the participants if they had any pre-existing relationships with the fellow participants (e.g. Gabbert et al., 2003; Gabbert et al., 2004; Meade & Roediger, 2002). Although the utilisation of heterogeneous groups can allow for a much easier sampling process (opportunity sampling), the ecological validity of such designs may be suspect due to the recurrent tendency for real eyewitnesses to have pre-existing relationships— with one survey indicating that 77% of eyewitnesses are likely to have a previous acquaintance with their co-witnesses (Paterson, Chapman, and Kemp, 2007).

To date, two research studies have suggested that eyewitnesses are more likely to conform to the memory recollections of co-witnesses that they share a pre-existing relationship with, relative to unfamiliar co-witnesses (French et al., 2008; Hope et al., 2008). French et al. (2008) attempted to identify if a pre-existing relationship between co-witnesses would facilitate an increase in memory conformity rates when giving a statement, by comparing the similarity in memory reports between romantic partners and strangers. The results indicated that the participants who had discussed the footage with a romantic partner were significantly more likely to recall false memories (unwitnessed items) than participants who had discussed the footage with a stranger. The findings suggest that the risks of memory conformity amongst eyewitnesses would be greater if the witnesses are in a romantic relationship. Hope et al. (2008) provided further insight on the relationship between co-witness familiarity and memory conformity, by also looking at the effects of co-witness discussions between friends on memory recall. Similarly, to French et al. (2008), the study found that participants were more likely to incorporate false memories from their friends and romantic partners, than from a stranger. Additionally, the study found no significant difference in statement similarity between friends and romantic partners, suggesting that the type of pre-existing relationship did not have an effect on memory conformity. Although the aforementioned studies were based on general memory recall tasks rather than specific blame attribution tasks, they highlight the significance of pre-existing relationships in mediating co-witness influence. More importantly, the studies

emphasise the importance of controlling for pre-existing relationships when attempting to reliably investigate the effects of co-witness discussions. Based on the observed relationship between co-witness familiarity and memory conformity rates, the present study argues that the vast majority of previous research which has failed to control for the variable of participant familiarity will have produced results which would not be representative of real eyewitnesses.

9.1.2. Building on the existing research on co-witness familiarity

9.1.2.1. *Pair versus group studies*

The two aforementioned studies on co-witness familiarity only observed the effects of co-witness influence on pairs. However, during most crimes there are often more than two eyewitnesses present (Memon et al., 2012; Paterson & Kemp, 2006; Skagerberg & Wright, 2008b), with one survey suggesting that, on average, there are over six co-witnesses present during an incident (Paterson & Kemp, 2006a). As demonstrated in the previous chapter, the level of co-witness influence exerted onto an individual is heavily dependent on the number of co-witnesses presenting the misinformation. On this basis, the present study postulated that there was a need for new research to investigate the effects of co-witness familiarity on blame conformity within larger eyewitness groups. However, to date, the effects of blame conformity have only been studied on eyewitness pairs.

9.1.2.2. *Use of confederates and alternate videos*

Many studies investigating the effects of memory conformity have exposed participants to misinformation with the use of confederates (e.g. Kieckhafer & Wright, 2014; Mckelvey & Kerr, 1988). Up until now, the empirical studies in the present thesis have also used confederates to present the participants with misinformation. However, for the present study, the use of confederates could have reduced the internal validity of the study. This is because, within the familiar co-witness condition, the role of confederate would have to be randomly allocated to one of the participants within each group. However, it is more than likely that the familiar individuals will possess different statuses amongst the group members with regards to competence and authority. Based on these characteristics, it could be suggested that the rate of memory conformity will be heavily influenced by the

participants who are allocated the role of confederate, rather than by the fact that the participants hold a pre-existing relationship with each other (Ost et al., 2008).

An alternative procedure, used by Hope et al., (2008) and French et al., (2008), was to show the participants slightly different videos to each other, in order to evoke discrepancies between their memories. Such a procedure has proven to be successful in studies that have measured the effects of co-witness influence amongst eyewitness pairs. However, the present study was concerned with studying the effects of co-witness familiarity in larger groups (of five). Therefore, it would have been highly impractical to create and present several different videos. Another limitation of showing participants alternative videos is that the participants may have been made aware that they would have viewed varying videos to other participants, which could have consequently affected their responses. Despite multiple studies carrying out post-test manipulation checks on the participants' suspicions, many participants may have been biased in their responses due to a response /observer-expectancy bias.

9.2. Present study

The present study was concerned with observing the effects of a post-event discussion between groups of co-witnesses. Specifically, the research aimed to examine whether the relationship between co-witnesses had an impact on the similarity of their statements, with regards to blame attribution. To achieve this, the study comprised three main objectives. The first objective was to establish whether a post-event discussion between co-witnesses could increase the level of group similarity in blame attribution. Although the previous empirical chapters have looked at the effects of co-witness information on an individual's blame attribution, the present study wanted to observe the effects of post-event discussions on the similarity of eyewitness statements when no confederates were planted. Based on the previous literature surrounding co-witness influence, the study predicted that eyewitness groups who engaged in a group discussion would produce a higher level of similarity in blame attribution, in comparison to eyewitness groups who did not discuss the event (H1). The second objective was to determine whether a pre-existing relationship between co-witnesses would significantly increase the level of group similarity in blame attribution, after a post-event discussion. Previous research on eyewitness pairs has shown that familiar co-witnesses are more likely to produce similar statements than non-familiar pairs (French et al., 2008; Hope et al., 2008). The present study predicted that similar findings would be present in larger groups during blame

attribution. Therefore, the second hypothesis predicted that familiar co-witness groups would produce the highest similarity score in blame attribution, relative to the unfamiliar co-witness groups and control groups (no group discussion) (H2). The final objective was to determine whether there was a significant difference in blame attribution accuracy between the experimental conditions. Despite the previous empirical studies identifying a link between co-witness discussions and false blame attributions, these observations were only made in conditions where participants were purposely exposed to misinformation (e.g. Thorley, 2015). It can be argued that when no misinformation is deliberately planted, the process of a co-witness discussion may not have a negative effect on the accuracy of the eyewitnesses' blame attributions. No hypotheses were made for the final objective, as the final objective was of an exploratory nature.

The study attempted to build on previous research into co-witness familiarity by investigating the effect of post-event discussions between groups rather than pairs. Although previous research has shown that an eyewitness can be influenced by misinformation provided by an unfamiliar co-witness, it was the contention of the present research that the inclusion of multiple co-witnesses would reduce the level of informational influence exerted by an individual. The present study also eliminated the need for confederates by incorporating an ambiguous blame attribution task, where co-witnesses were likely to have contradicting views regarding which suspect was guilty (as demonstrated within the previous empirical chapters).

9.3. Methodology

9.3.1. Participants

Four hundred and twenty participants (203 males; 212 females; 5 undisclosed) of mixed ages (18–83 years; $M = 33.04$, $SD = 15.62$) were recruited through opportunity sampling. The sampling procedure, along with details regarding the preliminary measures for participant suitability are presented in chapter 5.2.1.1.

In line with previous research (e.g. Wegner et al., 1991; Hope et al., 2008), participants in groups with pre-existing relationships were required to have known all other group members for a minimum of three months. The study recruited groups of individuals with both familial and friendship based relations for this condition.

9.3.2. Design & procedure

A one-way between-subjects design was employed, with three conditions. In all three conditions, participants were placed into groups of five, to represent a group of co-witnesses, giving a total of 84 groups. In the first condition, participants viewed the footage with strangers; however, no group discussion was permitted throughout the experiment (Control condition, $N= 32$ groups). In the second condition, participants viewed the footage and then discussed the witnessed event with unfamiliar co-witnesses (Stranger condition, $N= 16$ groups). In the final condition, participants viewed and discussed the witnessed event with individuals that they had a pre-existing relationship with (relationship condition, $N= 36$ groups). Type of relationship was not controlled for, as previous research identified no differences in co-witness conformity rates between individuals with different forms of pre-existing relationships (Hope et al., 2008). There were some discrepancies in sample size between the three conditions, with condition two consisting of significantly fewer eyewitness groups (16), relative to conditions one and three (32 and 36, respectively). The discrepancy was primarily due to the condition's requirement for participants to be completely unfamiliar with their co-witnesses. There were multiple cases where a participant from condition two (stranger condition) recognised one of their co-witnesses. Consequently, these groups had to be omitted from the study, reducing the overall number of groups within condition two. Despite this level of variance, all experimental conditions were still of sufficient size for statistical comparisons to be made (in accordance with Stevens, 2009).

Two dependent variables were measured. The first dependent variable measured was the similarity score in blame attribution within each co-witness group (see below for coding criteria); this variable is referred to as statement similarity. Secondly, the blame attribution accuracy (correct, incorrect, or uncertain) for each individual participant was measured, to determine whether co-witness discussions had an effect on blame attribution accuracy. Participants took part in the study in a group (either with strangers or acquaintances, depending on the experimental condition). The main procedure which is discussed in chapter 5.2.3 was implemented within this study

9.3.3. Materials

The closed-circuit television (CCTV) footage of a bar fight (described in chapter 5.2.2) was used as the study's experimental stimulus. The main point of interest within the

footage was the indication that the man in the dark green t-shirt had thrown the first punch and not the man in the yellow t-shirt.

9.3.4. Coding

Eyewitness's blame attributions were used as a measure for statement similarity. For this variable, the data was clustered, with each eyewitness group representing an individual data set. Each group was scored on the percentage of the most common answer given within the group (i.e. if four out of five group members blamed the suspect in the yellow for starting the fight, the group would have a similarity score of 80% etc.).

The second outcome variable was eyewitness accuracy. If the participant blamed the man in the dark green top for starting the fight they were scored as being *correct*. If the participant blamed the man in the yellow top as starting the fight they were scored as being *incorrect*. If the participant was uncertain about who had started the fight they were scored as being *unsure*. Within the study, three participants blamed a third party (a bystander who separated the fight) for starting the fight. Although this answer was incorrect, these participants were scored as "other" to differentiate them from participants who blamed the man in the yellow for starting the fight (also incorrect).

9.4. Results

9.4.1. Descriptive data

The control group was used to establish the baseline accuracy of eyewitness blame attributions. As shown in Table 9.1, there was a similar level of correct and incorrect statements (38.8% and 36.9%, respectively); an additional 22.5% of the participants stated that they were unsure as to who had started the fight. The variation of statements within the control group indicated that there would be conflicting judgements between group members in the experimental co-witness groups (post-event discussion). The data therefore supports the proposition that the footage used within the experiment was ambiguous as to who had started the fight.

The average similarity scores in blame attribution for the control condition were also compared in order to establish the a priori rate of statement similarity. There was a mean statement similarity score of 60% (SD = 15.86%) within the control group (see Table 9.2). This indicates that, on average, three out of five co-witnesses made the same blame attribution.

Table 9.1. Percentage of blame attribution accuracy between conditions.

	Correct	Incorrect	Unsure
Relationship	53.3.%	41.7%	10.6%
Stranger	40%	36.3%	23.8%
Control	38.8%	36.9%	22.5%

Table 9.2. Descriptive data for average statement similarity within eyewitness groups.

	N	M	S.D
Relationship	36	71.11%	19.39%
Stranger	16	65%	21.29%
Control	32	60%	16.06%

9.4.2. Unanimity of group statements

The first objective was to establish whether post-event discussion between co-witnesses could increase the level of group similarity in blame attribution. The second objective was to determine whether a pre-existing relationship between co-witnesses would significantly increase the level of group similarity in blame attribution after a post-event discussion. In fulfilment of the first and second objectives, the mean scores in statement similarity were compared between the three experimental conditions (control, strangers, and relationship), to identify if a post-event discussion influenced the participant's blame attribution and to determine whether there was a difference in the level of statement similarity between familiar and unfamiliar eyewitness groups.

A one-way between groups analysis of variance (ANOVA) was conducted to explore the impact of the group condition (control = no group discussion permitted; strangers= post-event discussion with unfamiliar co-witnesses; and relationship = post-event discussion with familiar co-witnesses) on statement similarity. The homogeneity of variance was violated ($p < .05$), and therefore a robust test of equality of means (Welch's ANOVA) was used. There was a significant effect of co-witness familiarity on statement similarity at

the $p < .05$ level for the three conditions, [$F(2, 38.12) = 3.3, p = .048$] (see Figure 9.1). The difference in mean scores between the groups was medium ($\eta^2 = .07$).

Post-hoc comparisons using the Tukey HSD test indicated that there was a significant difference ($p < .05$) in mean scores of statement similarity between co-witnesses with pre-existing relationships ($M = 71.11, SD = 19.39$) and co-witnesses in the control group ($M = 60, SD = 16.06$). The difference in mean scores was medium (Cohen's $d = .62$). There was no significant difference ($p < .05$) in mean scores of statement similarity between co-witness groups with pre-existing relationships and co-witness groups with no pre-existing relationships ($M = 65.71, SD = 19.03$). There was also no statistically significant difference in mean scores of statement similarity between co-witnesses with no pre-existing relationships and co-witnesses in the control group.

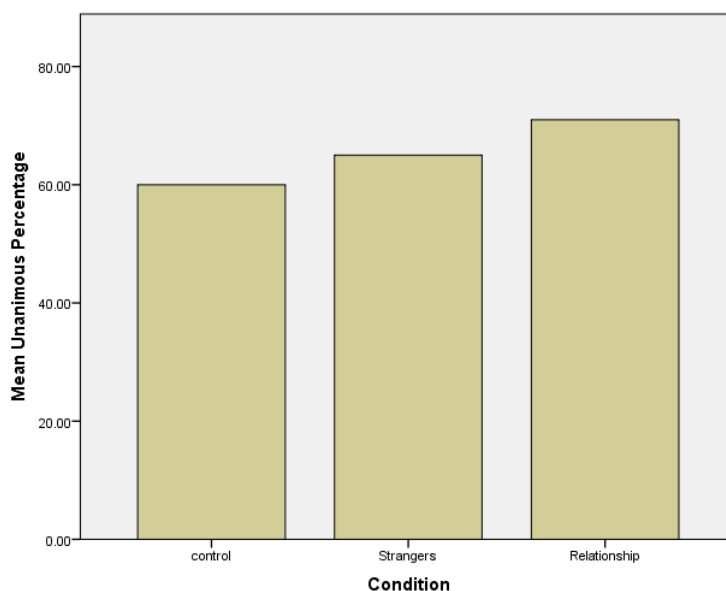


Figure 9.1 Mean percentage of group statement similarity.

9.4.3. Eyewitness blame attribution accuracy

The final objective was to determine whether there was a significant difference in blame attribution accuracy between the experimental conditions. A chi-squared test was carried out to see if there was an association between group condition and eyewitness blame attribution. The analysis found that there was a weak significant association between the experimental conditions and eyewitness blame attribution; [$\chi^2(6, N = 420) = 19.63, p < .01, \phi_c = .15$]. An examination of the standardized residuals revealed that among

participants who had a pre-existing relationship with their co-witnesses there were significantly fewer participants stating that they were unsure than expected. Participants in this group were significantly more likely to be influenced by their co-witnesses (see Figure 9.1), suggesting that participants who were uncertain about the event were more likely to conform to co-witnesses. No significant differences were found in the rates of correct or incorrect blame attributions between the experimental conditions ($p > .05$).

9.5. Discussion

The purpose of the present study was to establish the effects of post-event discussion between groups of co-witnesses. Specifically, the study aimed to determine whether the relationship between co-witnesses had an impact on the similarity of their statements, with regard to blame attribution (blame conformity). The first hypothesis predicted that eyewitness groups who engaged in a group discussion would produce a higher level of similarity in blame attribution, in comparison to eyewitness groups who did not discuss the event (H1). The overall results suggest that eyewitness groups that engage in post-event discussions would be more likely to produce similar blame attributions than witnesses who refrain from discussing the event with others; but only if the co-witnesses have a pre-existing relationship with each other— partially supporting the first hypothesis.

It must be noted that despite the present study identifying some significant differences in blame conformity rates between the experimental conditions, the study was unable to determine the cause of blame conformity during the trials. However, as discussed previously, Thorley (2015) suggested that the blame conformity was predominantly driven by informational influence. Therefore, the following discussion primarily draws on the theoretical construct of informational influence when explaining the observations of the present study.

9.5.1. Co-witness influence between strangers

Results suggest that post-event discussion with strangers did not have a significant effect on statement similarity. Although the descriptive data indicated that there was a

slightly higher percentage of statement similarity, in comparison to the control group (see Figure 9.1), the ANOVA showed that this difference was not significant. This finding is contrary to a large proportion of the memory conformity literature (see Gabbert et al., 2003; Gabbert et al., 2004; Kieckhafer & Wright, 2014; Meade & Roediger, 2002). For example; Kieckhafer and Wright (2014) found that eyewitnesses were susceptible to conforming to strangers when placed in co-witness groups of two. The discrepancies between the findings of the present study and previous research findings can be attributed to the difference in group size. Firstly, Kieckhafer and Wright (2014) argued that many eyewitnesses would be inclined to conform to strangers in an attempt to avoid receiving any form of negative evaluation from them. In the present study, multiple co-witnesses were present and the control condition data indicates that a mixed collection of responses could be expected within each group (Table 10.1). Therefore, it would be likely that the participant would not be disagreeing with a co-witness alone. *Social impact theory* states that social impact is divided between the individuals being targeted (Latane, 1981); therefore, the impact of any negative evaluation would be reduced and, consequently, participants in bigger groups would be less pressured to conform to the unfamiliar co-witness. Secondly, participants who are placed in a pair will only be exposed to their co-witness's misinformation. In such an environment, many participants will be susceptible to conforming to an unfamiliar co-witness if they lack confidence in their own memory reports (Wright et al., 2000). Within the present study, however, participants were exposed to the memory reports of four other co-witnesses rather than just one. In contrast to the previous research, participants will have therefore been likely to encounter co-witness information that supported their memory reports as well information that contradicted it. With research indicating that eyewitness confidence is more greatly affected by confirmatory feedback than by disconfirmatory feedback (Allwood et al., 2006), it can be argued that participants within the present study will have been less likely to conform to unfamiliar co-witness's due to also encountering confirmatory co-witness information.

Additional research on general social conformity suggests that individuals can conform to a group of strangers (Asch, 1952; McKelvey and Kerr, 1988); however, such studies have tested the effects of group pressure using unanimous confederates. In such situations, participants were placed in an environment where they were against a unanimous group with an opposing recollection. The unanimity of misinformation has been proven to be an essential factor for eliciting group conformity (Allen and Levine, 1968; Asch, 1955; Hardy, 1957; Malof and Lott, 1962; Morris and Miller, 1975). This is primarily due to its effects on the level of informational influence: if a group unanimously hold the same judgement, the target is more inclined to gauge their view as being more accurate (Baron et al., 1996). In the present study, co-witnesses were likely to have differing views,

therefore the break in unanimity will have reduced the level on informational influence. Based on the differences in the experimental designs and variations in the findings of the present study and previous research on memory conformity, it is suggested that the risks of conformity to unfamiliar co-witnesses may only emerge when the targeted eyewitness is exposed to co-witness information from either one co-witness or a group of co-witnesses who are unanimous in their reports.

9.5.2. Co-witness influence between familiar eyewitnesses.

The second hypothesis predicted that familiar co-witness groups would produce the highest similarity score in blame attribution, relative to the unfamiliar co-witness groups and control groups (H2). Results suggested that the risks of statement similarity were highest in groups of eyewitnesses who engaged in a post-event discussion with familiar co-witnesses, with the eyewitness groups within this condition producing the highest average similarity score in blame attribution, thus supporting the second hypothesis. The finding is concordant with the previous literature (e.g. French et al., 2008; Hope et al., 2008).

As mentioned previously; many relationships are maintained through a shared reality (Echterhoff et al., 2005; Sorrentino & Yamaguchi, 2008). As a result, many eyewitnesses may have been inclined to habitually accept the judgement of a co-witness they were close with as part of their behavioural routine. Hope et al. (2008) indicated that individuals are more likely to believe that they are more accurate than strangers, in comparison to their friends and family. This is primarily due to the fact that an individual will have more information about their peers from which to gauge the accuracy of their judgments (Festinger, 1954; Forgas & Williams, 2001; Gabbert et al., 2007). This would suggest that, during an eyewitness interview, the witness would be more likely to believe that a co-witness was correct if they had a pre-existing knowledge of their cognitive skills. Additionally, if a transactive memory system exists between co-witnesses, this would increase the chances of multiple group members accepting the information from the same co-witness whilst rejecting information from another (Wegner, 1986; Wegner et al., 1991). These explanations are supported by additional research: Thorley (2015) found that co-witness conformity was dependent on the eyewitness's ability to gauge the accuracy of their co-witness. Hope et al. (2008) also explained that eyewitnesses are likely to spend less time evaluating the reliability of a co-witness's judgement if they find the individual more likeable. Consequently, co-witnesses may be less aware of the inaccuracies of their acquaintances and therefore more likely to accept their information as reality.

The importance of a pre-existing relationship on blame conformity can also be attributed to an increased level of normative influence brought on by familiar co-witnesses. Walker and Heyns (1962) argued that individuals were more likely to conform to people that they self-identified with. This would suggest that the similarity between two individuals may mediate the likelihood of conformity between them. Previous research on self-attention suggests that this could be due to the individual evoking a matching to standard process, where they would interpret the judgement of a similar co-witness as the norm and attempt to conform to it (Carver & Scheier, 1981; Mullen, 1983). Co-witnesses with pre-existing relationships could be more inclined to share similarities with each other, therefore they may be more likely to attempt to match each other's behaviours.

Post-hoc tests indicated that the differences in statement similarity between participants who discussed the event with strangers and participants who discussed the event with familiar-co-witnesses did not reach statistical significance. It is proposed that, despite familiar co-witnesses being more inclined to conform to the reports of their peers, a discrepancy between some of the co-witnesses meant that participants within the same group may have chosen to conform to different co-witnesses; or may have just maintained their views that were concordant with another co-witness.

9.5.3. Post-event discussion and eyewitness accuracy

Participants' individual statements were also compared across all conditions to investigate the effect of post-event discussion on blame attribution accuracy. Despite the data suggesting that eyewitnesses can be influenced by familiar co-witnesses, there was no evidence suggesting that this would result in an increase in false eyewitness statements. The distribution between correct and incorrect statements remained relatively constant across all conditions (see Table 9.2), with no significant differences found. Findings did, however, suggest that eyewitnesses were significantly more likely to be certain after discussing the event with familiar co-witnesses. This suggests that eyewitnesses who are more uncertain about an event will be significantly more susceptible to being influenced by others around them. This proposition is supported by previous research that has identified a positive relationship between uncertainty and susceptibility to informational influence (Smith et al., 2007; Walther et al., 2002; Zajac & Henderson, 2009). Despite the results finding no evidence to suggest that post-event discussions could have a negative effect on eyewitness statement accuracy, the results do suggest that eyewitnesses who discuss the event with others would be more likely to make a blame attribution, in comparison to those

who do not engage in a post-event discussion; and this attribution could be through peer influence rather than personal memory— a behaviour that might consequently create unreliable courtroom evidence.

This observation can be explained through drawing on the fundamental principles of transactive memory systems and group relations. Individuals will develop interpersonal schemas about the knowledge and abilities of their acquaintances relative to themselves and others, through the learning of previous interactions (Wegner, 1986; Wegner et al., 1991). The development of this transactive memory will allow them to identify which person would be most likely to be correct (Wegner, 1995). As Table 9.1 indicates, the descriptive data from the control groups suggest that there will have been discrepancies between co-witnesses in all experimental conditions during the post-event discussion. Uncertain eyewitnesses who were familiar with their co-witnesses will have been able to draw on their previous knowledge to make a confident judgment as to which co-witness would be most likely to be correct; whereas eyewitnesses who were not familiar with their co-witnesses will not have been able to draw on such resources, thus they will have remained uncertain as to who had started the offence.

9.5.4. Limitations and directions for future research

Whilst the present study extends the previous literature by investigating the relationship between co-witness familiarity and statement similarity within large eyewitness groups, there are a number of limitations which need to be acknowledged and which future research should seek to address, in order to understand the relationships between co-witness familiarity and blame conformity further.

The results suggest that possible interaction effects may exist between co-witness familiarity and post-event discussions; however, only unfamiliar eyewitness groups were included in the control condition in the present study. Through incorporating a 2x2 design, where both familiarity and group discussion could be manipulated, future research should aim to identify if statement similarity is predominately caused by informational influence or similarities in the way familiar co-witnesses remember events.

Further, although a distinct criterion was set for recruiting eyewitness groups with pre-existing relationships, the nature of each relationship, as well as duration, was not considered in the analyses. Focusing on these variables would allow future research to measure the moderating effects relationship characteristics may have on statement similarity.

The present study incorporated a single blame attribution task to measure statement similarity. Although the task was able to accurately simulate the process of eyewitness blame attribution, there were only three potential responses, meaning that there was not much room for variability in both response accuracy and statement similarity. By including additional information from the participants' memory reports when assessing response accuracy and statement similarity, richer data with greater levels of variation could be obtained. This would allow the researchers to make more detailed comparisons between familiar and unfamiliar co-witnesses during post-event discussions.

9.5.5. Conclusion

In summary; the present findings suggest that co-witnesses with pre-existing relationships are at a higher risk of producing similar blame attributions after a co-witness discussion, in comparison to unfamiliar co-witnesses. This could have detrimental effects on the investigation process if one of the co-witnesses were to relay inaccurate information about the event. The following suggestions are made for counteracting such effects: Kieckhafer and Wright (2014) emphasised the importance of police officers identifying whether eyewitnesses had discussed the event with others prior to giving their statements. The present study supports this proposal; by establishing if any post-event discussion has occurred, officers will be able to form a better assessment of the statements given. Additionally, in agreement with French et al. (2008) - it is suggested that police officers should attempt to identify whether co-witnesses who discussed the event had a pre-existing relationship and for this information to be taken into consideration by both investigators and those within the judicial system. It must be noted that, although inferred, there is no evidence indicating an effective intervention technique for helping eyewitnesses improve their source attribution skills when giving an eyewitness statement. Therefore, a more practical implication of the present findings, and the next direction for future research to take, would be to identify effective intervention techniques in reducing the rate of misinformation recall from co-witnesses.

Chapter 10:

Study 4: Perceived Competence and Co-witness Influence

10.1. Introduction

Research indicates that the social characteristics of an information source have an effect on how influential they are on co-witnesses (Betz et al., 1996; Forgas & Williams, 2001). More specifically, it is the way in which the information source is perceived by their co-witnesses that affects their level of informational influence (Echterhoff et al., 2005; Skagberg & Wright, 2009; Williamson et al., 2013). Blank (2009) argued that informational influence heavily revolved around the credibility of the information source. It has been suggested that when an individual encounters misinformation from an unfamiliar individual, they will often use schema-guided information about the stranger to make stereotypical assumptions of them (Carver & Garza, 1984). Individuals automatically activate stereotypes when they confront strangers (Devine, 1989); the present study argues that eyewitnesses use any available social cues from a co-witness to form a stereotypical judgement of their abilities to recall information accurately. The current chapter proposes that this estimation may be the primary cause for co-witness conformity amongst strangers.

10.1.1. Perceived competence

Thorley (2015) found that participants were selective on who they chose to conform to when attempting to recall an event and attribute blame. Participants were more likely to conform to co-witnesses that were perceived as having better memory over co-witnesses that they deemed as being more reliable. This suggests that eyewitnesses will be more concerned with the competence of their co-witness rather than their reliability, when deliberating on whether to accept their information. Such studies suggest that eyewitnesses use negative stereotypes to assess the competence of their co-witnesses. Positive stereotyping can also be used by eyewitnesses when conforming to misinformation; research shows that the voice of an information source can have an effect on how influential they are to others through positive stereotyping between the voice of an individual and their predicted level competence (Vornik, Sharman, & Garry, 2013). Research suggests that people are likely to associate those who are more competent than them as having exceptionally high intelligence (Alicke, LoSchiavo, Zerbst, & Zhang, 1997). Based on this, it can be suggested that an individual's intelligence could be used as a more generalisable

indicator of competence. In relation to intelligence and eyewitness competence, Brigham and Wolfskeil (1983) found that individuals were likely to use the perceived intelligence of an eyewitness as an indicator of their competence in presenting an accurate memory report. As discussed in Chapter 4.7, the relationship between perceived competence and co-witness influence can be attributed to the theoretical model of informational influence, which postulates that an individual will be more likely to conform to an information source, if they perceived the source to be more likely to be correct than them (French et al., 2011).

10.1.2. Perceived status and authority

Research also suggests that the perceived authority of a co-witness may also have a moderating effect on their level of influence over other co-witnesses (Vornick et al., 2003). The effects of police officers as misinformation sources have been used as a means of measuring the effect of authority and credibility on co-witness influence (e.g. Skagberg & Wright; 2009; Stanny & Johnson, 2000; Williamson et al., 2013); due to the majority of the general public perceiving police officers as having a significantly high level of authority and credibility (Jackson, Bradford, Hough, Myhill, Quintin, & Tyler, 2012). The majority of the studies agree that eyewitnesses are significantly more likely to be misled by misinformation from a police officer than from an individual with a non-authoritative occupation (such as a student, Skagerberg & Wright, 2009; or an electrician, Williamson et al., 2013). However, Williamson et al. (2013) found that despite police officers being rated as more credible eyewitnesses than non-officers (electricians), there was no significant relationship between credibility of the misinformation source and co-witness conformity. Instead, the study found that participants were more likely to conform to the recollections of police officer confederates, due to perceiving them as having a better memory than their own. Therefore, it can be suggested that participants are more inclined to fixate on their co-witness's cognitive abilities in memory retrieval rather than their status when attempting to validate their judgement.

10.2. Present study

The present study aimed to examine whether the perceived level of authority and intelligence of an eyewitness (confederate) would have an effect on their level of influence over their co-witness. Previous research shows that for informational influence to be

effective within an eyewitness setting, the targeted individual must consciously believe that the source of misinformation is more likely to be correct than them (French et al., 2011). In order to make such an assessment, the target actively uses any social cue indicative of their co-witness's ability to make this judgement (Williamson et al., 2013). Multiple research studies indicate that intelligence can predict eyewitness accuracy (Dent and Flin, 1992; Roebbers & Schneider, 2010). Research also shows that the perceived intelligence of an eyewitness can be used by others to determine their recall accuracy (Brigham & WolfsKeil, 1983). These findings would suggest that the perceived intelligence of an information source could have an effect on their level of informational influence; however, to date, very little research has been carried out to investigate this relationship. Based on the existing literature, the study predicted that there would be a significant relationship between the perceived intelligence of the misinformation source and co-witness influence (H1).

With regards to previous research employing police officers as the misinformation source; the current study argues that increased conformity rates to confederates is primarily due to their perceived cognitive skills and not their perceived level of credibility or authority. Consequently, the second hypothesis of the study predicted that an increase in the perceived authority of a misinformation source would not have a significant effect on co-witness influence, after controlling for perceived intelligence (H2).

To carry out these aims, the present study measured and compared the blame conformity rates of participants who had viewed and discussed the criminal event with a confederate who was either shown as having a) high intelligence and high authority; b) high intelligence and no indication of authority; c) no indication of authority or intelligence; or d) the participant was not permitted to discuss the event with the confederate (control). If the results indicated a relationship between an indication of high intelligence and blame conformity, we could deduce that an eyewitness's perceived level of intelligence can have a significant effect on how influential they are to co-witnesses. In addition, if the results would indicate no significant relationship between indications of high of authority and blame conformity, we could deduce that perceived intelligence would be a stronger predictor of co-witness influence.

Research also shows that post-event discussions can have both positive and negative effects on the confidence that eyewitnesses place in their judgments (Semmler et al., 2004; Wright & Skagerberg, 2007). Eyewitnesses who choose not to conform to misinformation can still lose confidence in their statements which, in turn, could weaken the validity of their statements to jurors (Brewer & Burke, 2009). Conversely, research also indicates that misinformation can elicit a false sense of overconfidence in eyewitnesses holding a similarly false recollection of the event (Goodwin et al., 2013). Therefore, the confidence scores of

eyewitness statements were also assessed as an alternative way of measuring for co-witness influence. Based on the previous empirical chapters' observations on eyewitness confidence being incongruous, no direct hypotheses were made on the relationship between the confederate's characteristics and eyewitness confidence.

As mentioned previously, the majority of studies measuring the effects of authority on co-witness influence used an experimental design where the influence of police officers was compared to the influence of individuals with low authority (such as a child, Skagerberg & Wright, 2009; or electricians, Williamson et al., 2013). A problem with such a design is that both negative and positive stereotyping would be affecting the participants. On one hand, participants may be more inclined to conform to police officers because they would deem them as having an exceptionally higher than average level of credibility or cognitive ability in recalling the event. On the other hand, results could have been due to the participants deeming the other confederates (especially children) as having a below-average level of credibility or cognitive ability, and consequently being deterred from conforming to them. Therefore, within the present study participants were either paired with a confederate who was identified as a police officer, a PhD student, both, or a confederate who did not disclose their occupation. This design was implemented so that any significant differences in co-witness conformity rates between the two conditions could be confidently attributed to the co-witness's increased level of authority and credibility.

10.3. Methodology

10.3.1. Participants

The study recruited 193 students (94 males; 99 females). The age of the participants ranged 18 to 30 ($M = 21.63$, $SD = 2.61$). The sampling criterion excluded any post graduate students or police officers (past or present) from participating in the study. As a result, participants from this study were all relatively younger than participants from the previous studies within the thesis. However, as the previous studies within the thesis demonstrated, age did not seem to have an influence on participant response— thus the findings of the present study should still be generalizable for individuals of a wider age range. Participants were awarded course credit for their participation. Preliminary tests were undertaken to ensure that no participants had any serious visual impairments that would affect their ability to watch the crime footage on a computer screen.

10.3.2. Design

In a four-way between-subjects design, participants viewed a closed-circuit television (CCTV) footage of a fight breaking out inside of a bar. With the exception of the control group, participants would then discuss the event with a confederate before giving an individual statement. The independent variable within the study was the amount of information provided to the participants about their co-witness (three experimental conditions and a control condition). More specifically, the confederate's occupation and level of education was used as an indicator of their level of authority and intelligence, respectively.

The first condition acted as the control group ($N = 83$), participants were not given permission to discuss the event with their co-witness. The second condition ('No IQ/No Authority', $N = 38$) allowed participants to discuss the event with their co-witness, however no information about the co-witness's credentials were provided. The third condition ('High IQ/No Authority', $N = 32$) allowed participants to discuss the event with their co-witness. In this condition, the experimenter would ask the participants to state their highest level of education; the confederate would state that she was a PhD researcher (indicating high intelligence). The researcher decided to use education as an accurate indicator of intelligence due to research indicating that the two variables are frequently associated with each other by individuals (Fouad et al., 2009). The fourth condition ('High IQ/High Authority', $N = 37$) allowed participants to discuss the event with their co-witness. In this condition, the experimenter would ask the participants to state their highest level of education and their occupation; the confederate would state that she was a PhD student (indicating high intelligence) and a police officer (indicating high authority). The occupation of police officer was used due to the general public's perceptions of police officers as highly authoritative individuals (Garrido et al., 2004; Jackson et al., 2012; Williamson et al., 2013). Due to the researcher's affiliated institution specialisation in policing research (International Research Centre for Investigative Psychology), the prevalence of police researchers was common and less likely to be questioned by the student participants. The design did not include an experimental condition where the confederate was only presented as a police officer. This was to reduce the risk of participants doubting the authenticity of the confederate. The study was advertised for University students only, therefore the inclusion of a non-student participant who was coincidentally a police officer ran the risk of arousing suspicion from the participants. The study only recruited undergraduate students and ensured that none of the participants had post-graduate qualifications or any experience of working/volunteering for any policing organisations. As a result, participants

would be likely to perceive the PhD confederates as being more intelligent than them and the police officer confederates as being more authoritative than them (although this could not be guaranteed).

Two dependent variables were observed as measures of co-witness influence. The first variable was the false blame attribution rates of the participants (blame conformity). There were two potential suspects within the footage, with the confederates being instructed to state that the wrong suspect had started the fight. Therefore, a significant change in false blame attribution rates between the experimental conditions would suggest that there was a significant difference in co-witness influence between the different conditions. Participants were also asked to give a confidence score on their judgement, the level of confidence for participants who answered both correctly and incorrectly were compared between the experimental conditions to identify if the confederate's misinformation would influence the level confidence participants would place in their judgement. The participant's confidence judgements were measured on a five-point Likert scale, with five indicating the maximum level of confidence.

10.3.3. Confederates

The study used confederates as a method of exposing the true participants to co-witness misinformation. The experiments took place in two different locations as a result, two volunteers were recruited to act as the confederate. To prevent the individual differences of one confederate from having a mediating effect on their level of influence, the study recruited two volunteers with similar identities: both were Caucasian females, aged 23. The researchers were aware that the participant's respective age and gender may have had an effect on their perception of the confederates. Therefore, the analyses of the present study controlled for the variables of participant age and gender.

10.3.4. Materials

The closed-circuit television (CCTV) footage of a bar fight (described in chapter 5.2.2) was used as the study's experimental stimulus. The main point of interest within the footage was the indication that the man in the dark green t-shirt had thrown the first punch and not the man in the yellow t-shirt.

10.3.5. Procedure

Participants took part in the study in pairs of two (one participant and one confederate). Due to the ethical considerations of exposing participants to violent footage, participants had to be informed that they would be viewing a CCTV footage that contained violence, in order to gain consent from them. Details in regards to the aims of the experiment were kept to a minimum.

Depending on the experimental condition, the pairs may have been asked specific questions about their background prior to watching the crime footage. In the third condition (High IQ/No Authority), participants were asked by the experimenter to verbally state their highest level of education. In the fourth condition (High IQ/High Authority), participants were asked by the experimenter to verbally state their highest level of education and occupation. In these conditions, the confederates were instructed to always state that they were a PhD student (for education) and/or that they were a police officer (for occupation). The main procedure which is discussed in chapter 5.2.3 was then implemented, with the participants watching and discussing the criminal incident with their confederate (with the exception of the control group), before being interviewed privately by the investigator.

10.4. Results

The focus of the present study was to determine whether the perceived level of authority and intelligence of an eyewitness (confederate) would have an effect on their level of influence over their co-witness. The main results are presented in two sections. First, evidence for the relationship between the confederate's characteristics and co-witness suggestibility is given through an analysis of eyewitness blame attribution (first dependent variable). The second section of the results investigates the relationship between the confederate's characteristics and co-witness suggestibility through analyses of eyewitness confidence (second dependent variable). Means and standard deviations for the distribution of blame attribution are presented in Table 10.1 and Figure 10.1; and the mean confidence scores across all conditions and responses are presented in Table 10.2. The base error rate in blame attribution was relatively high with 39.5% of the participants within the control group blaming the wrong suspect for starting the altercation (see Table 10.1). The researcher purposely used a difficult task for the simulation in order to elicit some level of uncertainty amongst the participants. As Table 10.1 indicates, the error rate increased when participants were exposed to co-witness misinformation. Within the control condition, the

confidence scores in eyewitness statements were relatively similar between correct and incorrect judgements (see Table 10.2).

Table 10.1. Distribution of eyewitness responses between conditions (N=193).

Condition (N)	Answer		
	Incorrect	Correct	Unsure
Control (N=86)	39.5%	43%	17.4%
No IQ/ No Authority (N=38)	44.7%	34.2%	21.1%
High IQ/ No Authority (N=32)	71.9%	21.9%	6.3%
High IQ/ High Authority (N=37)	73%	16.2%	10.8%

Table 10.2. Mean confidence scores in blame attributions (N=164).

Condition (N)	Incorrect		Correct	
	M	SD	M	SD
Control (N=71)	2.94	.92	2.89	1.21
No IQ/ No Credibility (N=30)	3.35	1.06	3.38	.96
High IQ/ No credibility (N=30)	3.43	1.31	2.71	.95
High IQ/ High Credibility (N=33)	3.19	1.04	3.33	1.37

Note. Confidence scores for 'Unsure' answers were excluded due to not being applicable

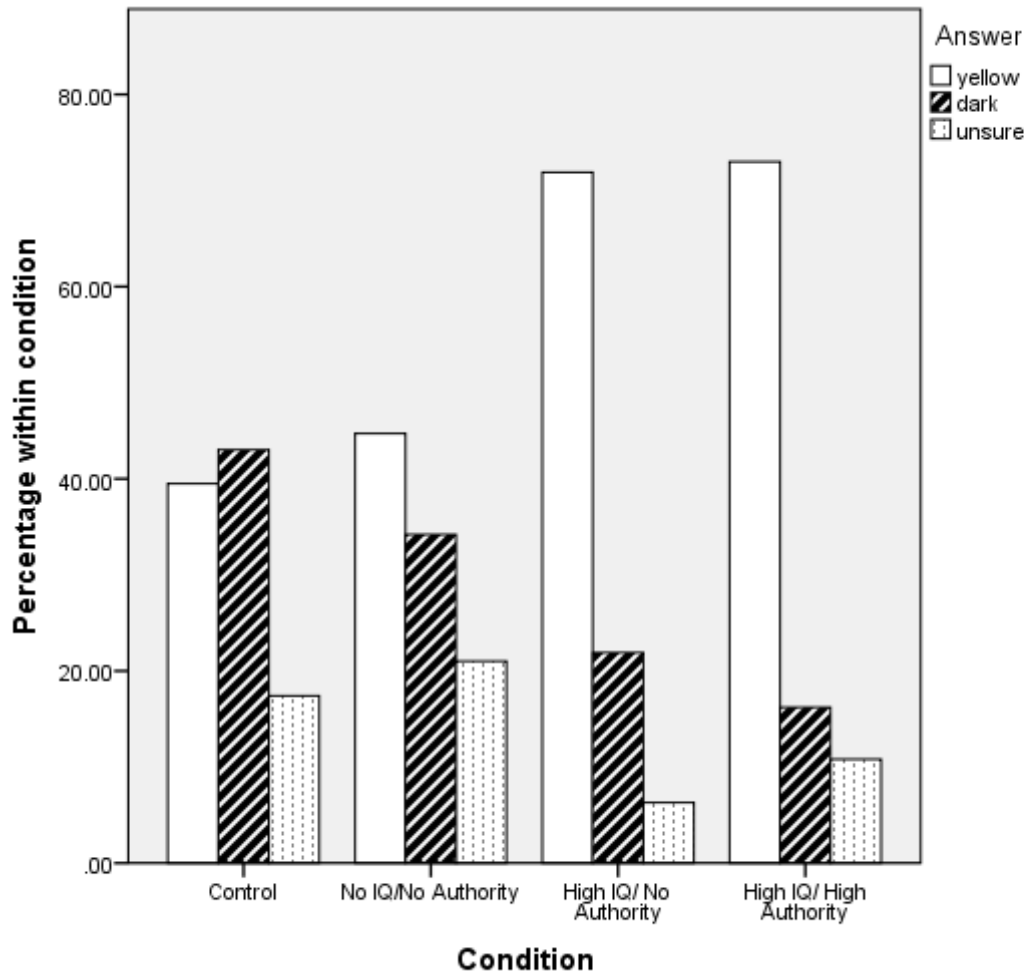


Figure 10.1. Distribution of eyewitness responses between the conditions.

10.4.1. Blame conformity

False blame attribution rates were first analysed to determine whether there was a significant difference in co-witness influence between the experimental conditions. A Multinomial Logistic Regression was used to analyse predictors for an unordered group classification of eyewitness statements, such as participants who produced a correct response (dark top), participants who produced an incorrect response (yellow top), and participants who stated that they were uncertain about who had started the fight (unsure). Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. Due to the dependent variable consisting of three outcomes, two regressions were conducted: one with the incorrect response as the reference category (yellow top; misinformation), and one with the correct response (dark

top) as the reference category. The main interest of current analysis was focused on the relationship between an eyewitness's characteristics and their influence on co-witness statements (3 categories) while controlling the participant's age and gender. The analysis found that the model fit was significant, [$\chi^2 (10, N=190) = 27.96, p < .01$], indicating that both full models predicted significantly better, or more accurately, than the null model.

The first column in Table 10.3 has the outcome of 'correct response' compared to 'incorrect response' (reference category). The results suggested that the age and gender of the participants had no significant effect on their responses. In relation to the experimental conditions, the results suggested that participants who were exposed to misinformation from a confederate who was either presented as having high intelligence ($OR=.23$) or high intelligence and high authority ($OR=.21$), compared to participants from the control condition, were significantly more likely to report the misinformation (incorrect response). The measures of association were large, in accordance to Cohen (1988). The effect sizes, calculated using Cohen's d , were $-.81$ and $-.86$, respectively. The results suggested that there were no significant differences in blame attribution responses between participants from the control condition and participants who were exposed to the misinformation from a confederate with no indication of intelligence or authority.

The second column in Table 10.3 has the outcome of 'unsure' compared to 'incorrect response' (reference category). Statistical analysis indicated that the age and gender of the participants had no significant effect on their responses. In relation to the experimental conditions, the results suggested that participants who were exposed to misinformation from a confederate who was presented as having high intelligence ($OR=.19$), compared to participants from the control condition, were significantly more likely to report the misinformation (incorrect response). The measure of association was large, in accordance to Cohen (1988). The effect size, calculated using Cohen's d , was $-.92$. The results suggested that there were no significant differences in blame attribution responses between participants from the control condition and participants from the remaining conditions.

The third column in Table 10.3 has the outcome 'unsure' compared to 'correct response' (reference category). The results suggested that the age and gender of the participants had no significant effect on their responses. Similarly, the results also indicated that the group condition was not a significant predictor for the direction of the participants' responses.

Table 10.3. Multinomial logistic regression predicting eyewitness blame attribution

Variable	Correct response ^a (N=63)		Unsure ^a (N=29)		Unsure ^b (N=29)	
	OR (95% CI)	SE	OR (95% CI)	SE	OR (95% CI)	SE
Age	.99 (.87/1.13)	.07	1.16 (.99/1.35)	.08	1.17(.99/1.38)	.08
Gender						
Male	1.07 (.55/2.08)	.34	1.91 (.79/4.6)	.45	1.79 (.72/4.45)	.47
Female	1		1		1	
Confederate's characteristics						
Control	1		1		1	
No IQ/No credibility	.8 (.34/1.84)	.44	1.27 (.44/3.7)	.55	1.59 (.54/4.69)	.55
High IQ/High credibility	.21 (.08/.56)**	.51	.3 (.09/1.05)	.64	1.49 (.36/6.17)	.73
High IQ/no credibility	.23 (.08/.64)**	.52	.19 (.04/.94)*	.81	.83 (.15/4.65)	.88

Note. a= Reference group: 'incorrect response' (N=101); b= Reference group: 'correct response'

(N=63). OR= Odds Ratio. SE = Standard Error. 95% CI = Confidence Interval. * $p < .05$. ** $p < 0.01$.

The distribution of correct, incorrect, and unsure responses was then compared between participants who were exposed to misinformation from a confederate with high intelligence and high credibility and participants who were exposed to misinformation from a confederate with high intelligence only, to determine whether there was a significant difference in co-witness influence between the two conditions. The analysis was subjected to a 2 X 3 chi-square test of independence. The analysis found no significant differences in blame attribution between the two conditions, [$\chi^2 (2, N = 69) = .48, p > .05$].

10.4.2. Confidence

For the second part of the results, the confidence judgements of participants who answered correctly and incorrectly were analysed to determine whether exposure to co-witness misinformation influenced the level of confidence that participants placed in their responses. Moreover, the researchers wanted to determine whether the relationship between co-witness misinformation and eyewitness confidence could be predicted by the perceived intelligence and authority of the confederate.

10.4.2.1. Eyewitness confidence in correct responses

Hierarchical multiple regression was performed to investigate the ability of a co-witness's perceived level of intelligence and authority (group condition) to predict the confidence ratings of participants who gave correct statements (rejected misinformation), after controlling for participant age and gender. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, and homoscedasticity.

In the first step of hierarchical multiple regression, two predictors were entered: age and gender. This model was not statistically significant [$F(2, 60) = 1.51; p > .05$] and explained 4.8% of variance in eyewitness confidence (see Table 10.4). After entry of the confederate's characteristics (group condition) at Step 2, the total variance explained by the model as a whole was 7.2% [$F(3, 59) = 1.54; p > .05$]. The introduction of confederate's characteristics explained an additional 2.4% of variance in eyewitness confidence, after controlling for participant age and gender [$R^2 \text{ Change} = .02; F(1, 59) = 1.56; p > .05$]. In the final adjusted model, none of the predictor variables were statistically significant.

Table 10.4. Hierarchical Regression Model of confidence in correct statements.

	<i>R</i>	<i>R</i> ²	<i>R</i> ² <i>Change</i>	<i>B</i>	<i>SE</i>	β	<i>t</i>
Step 1	.22	.05					
Age				-.06	.05	-.15	-1.14
Gender				-.4	.27	-.18	-1.45
Step 2	.27	.07	.02				
Age				-.06	.05	-.15	-1.18
Gender				-.47	.28	-.22	-1.68
Confederate's characteristics				-.16	.13	-.16	-1.25

Note. No statistical significance measured between variables.

10.4.2.2. Eyewitness confidence in incorrect responses

Hierarchical multiple regression was performed to investigate the ability of a co-witness's perceived level of intelligence and authority (group condition) to predict the confidence ratings of participants who gave incorrect statements (as suggested by the confederate), after controlling for participant age and gender. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, and homoscedasticity.

In the first step of hierarchical multiple regression, two predictors were entered: age and gender. This model was not statistically significant [$F(2, 98) = 1.64; p > .05$] and explained 3.2% of variance in eyewitness overconfidence (see Table 10.5). After entry of the confederate's characteristics (group condition) at Step 2, the total variance explained by the model as a whole was 5.7% [$F(3, 97) = 1.95; p > .05$]. The introduction of confederate's characteristics explained an additional 2.4% of variance in eyewitness overconfidence, after controlling for participant age and gender [$R^2 \text{ Change} = .02; F(1, 97) = 2.52; p > .05$]. In the final adjusted model, none of the predictor variables were statistically significant.

Table 10.5. Hierarchical Regression Model of eyewitness confidence in incorrect statements.

	<i>R</i>	<i>R</i> ²	<i>R</i> ² <i>Change</i>	<i>B</i>	<i>SE</i>	β	<i>t</i>
Step 1	.18	.03					
Age				-.04	.05	-.1	-.95
Gender				-.3	.22	-.14	-1.36
Step 2	.24	.06	.02				
Age				-.05	.05	-.11	-1.13
Gender				-.26	.22	-.12	-1.19
Confederate's characteristics				-.15	.09	-.16	-1.59

Note. No statistical significance measured between variables.

10.5. Discussion

Much of the existing literature has argued that exposure to post-event misinformation can influence the recollections and consequent statements of eyewitnesses (Gabbert et al., 2004; Garry et al., 2008; Granhag, Memon, Gabbert, & Allwood, 2004; Carlucci et al., 2010; Paterson & Kemp, 2006; Wright et al., 2005). The present findings lend further support to this notion, participants who were exposed to misinformation from a co-witness were more likely to make the same erroneous judgement when recalling the event and giving their statements about who had thrown the first hit.

An immediate inference that can be made from such an observation is that the occurrence of blame conformity is possible, where post-event discussions occur. More specifically, the results suggest that some participants may choose to adopt the recollections of others over the information retrieved from their own recall memory, if they deem the individual to be competent enough. Further implications of the findings would suggest that false convictions could therefore occur if investigators are unable to differentiate information that eyewitnesses observed, from information that they were exposed to post-event. As a result, it is common practice within most policing organizations for officers to separate eyewitnesses prior to recording their statements (Paterson & Kemp, 2006), however such interventions cannot always be successfully implicated.

10.5.1. Intelligence and co-witness influence

The current study aimed to determine whether the perceived level of authority and intelligence of an eyewitness (confederate) had an effect on their level of influence over their co-witness. The first hypothesis predicted that there would be a significant relationship between the perceived intelligence of the misinformation source and co-witness influence (H1). For this observation, the researcher compared the responses of the participants from the control condition (no group discussion), with the responses of the participants from the other three experimental conditions. The findings suggested that participants were significantly more likely to conform to the misinformation, if their co-witness was identified as a PhD student; however, exposure to co-witness misinformation from a confederate with no indication of intelligence did not seem to have any effect on the participants' responses. The findings supported the first hypothesis. The findings suggest that eyewitnesses are more likely to conform to the recollections of co-witnesses who they perceive as being more intelligent. The findings also suggest that eyewitnesses would make stereotypical judgments about the accuracy of their co-witnesses based on any knowledge they have on them. More importantly, the results suggest that eyewitnesses will act on these judgements and conform to the co-witnesses, if they perceive them as having a greater level of intelligence.

With previous research indicating that eyewitnesses are more likely to conform to co-witnesses that they deem to have accurate memory (Williamson et al., 2013), it is suggested that the present study's participants will have used the intelligence of their co-witnesses as a predictor of their ability to interpret and recall the witnessed event accurately. These findings are supported by numerous past studies which have also yielded results suggesting that eyewitnesses will make stereotypical assessments about the accuracy of their co-witnesses and, in turn, act on these judgments by conforming to them (see Kwong See et al., 2001; Thorley, 2015). Thorley (2015) found that eyewitnesses were significantly less likely to conform to misinformation from an elderly co-witness than compared to a younger adult co-witness. The researcher attributed the difference to participants making negative assessments about the elderly co-witness's recall memory based on their age. The present study argues that as well as negative assessments, eyewitnesses can also make positive stereotypical judgements about their co-witness's abilities. Although general intelligence, or - more specifically - an individual's level of education, is not a direct measure of memory recall accuracy, the present findings suggest that eyewitnesses can use any schema-guided information about their co-witness's intelligence as a means for gauging their ability to attribute blame correctly.

Social-psychological theories on eyewitness behaviour indicate that for an eyewitness to conform to the informational influence of co-witness, they must perceive their co-witness as being more likely to be correct than themselves (French et al., 2011; Williamson et al., 2013). Therefore, the present chapter argues that the effects of the information source's perceived intelligence on their level of influence is relative to the perceived self-intelligence of the target eyewitness. Subsequently, the relativity of such assessments offers an explanation as to why many individuals will choose to refrain from conforming to misinformation, even when presented by someone with a high level of intelligence.

10.5.2. Authority versus intelligence

Previous research had demonstrated that participants were more likely to conform to the memory reports of police officers, in comparison to co-witnesses with non-authoritative occupations (Skagerberg & Wright, 2009; Williamson et al., 2013). Some theories attributed this effect to a police officer's heightened level of authority and credibility, inducing greater levels of normative and informational influence (respectively) (Echterhoff et al., 2005; Hoffman et al., 2001; Kwong See et al., 1987). However, more recently, Williamson et al., (2013) produced evidence suggesting that it was the heightened level of perceived competence that increased a police officer's informational influence on co-witnesses. The present study argued and demonstrated that perceived competence (demonstrated through perceived intelligence) did, in fact, have an effect on co-witness influence.

Based on the assertions made by Williamson et al. (2013), the second hypothesis of the study predicted that an increase in the perceived authority of a misinformation source would not have a significant effect on co-witness influence, after controlling for perceived intelligence (H2). To investigate for this effect, the researchers compared the prevalence rates of false eyewitness statements between participants who were exposed to misinformation from a co-witness with high intelligence and authority, and participants who were exposed to misinformation from a co-witness with high intelligence but no indication of authority. The results indicated that there were no significant differences in false eyewitness statements between co-witnesses who were only presented as having high intelligence and co-witnesses who were presented as having high intelligence and credibility, supporting the second hypothesis. The findings also suggested that the authority of a co-witness had no additional effect on influencing the participants' statements.

As discussed earlier; the authority of the police officer may not have had an increased their influence due to the participants being interviewed privately. It was

suggested that individuals would be more likely to conform to police officers through their compliance and obedience to someone of higher authority. However; with the police officer confederate not being aware of the participant's final response, the participants may have felt less pressure to conform to the confederate's erroneous blame attribution.

With regards to the credibility of the police officer; one suggestion that can be drawn from this observation is that eyewitnesses may only be concerned with the intelligence of their co-witness when assessing their judgement. The findings do not necessarily imply that the perceived competence of an information source does not have any effect on their level of influence. Instead, the results suggest that - to an eyewitness - the intelligence of a co-witness acts as a greater predictor for the validity of their statements than their credibility. Such implications are supported by previous research; Williamson et al. (2013) found that participants were significantly more likely to conform to co-witnesses who they perceived as having a more accurate memory relative to themselves, yet the heightened credibility of the police co-witness had no effect on influencing the participants. Through these studies it can be inferred that eyewitnesses are more likely to agree with competent co-witnesses than reliable co-witnesses. This inference is further supported by Thorley (2015), who found that despite perceiving elderly eyewitnesses as being more reliable, participants were more likely to conform to younger co-witnesses, due to perceiving them as having more accurate memory.

The insignificance of source credibility on co-witness influence can be a result of pre-existing truth biases held by the participants in laboratory experiments. Research on the detection of deception suggests that when assessing the credibility of an individual's statement, people will be biased towards believing that the individual is telling the truth (Bond & DePaulo, 2006; Van Swol & Braun, 2015; Vrij, 2008). Additionally, Bond and DePaulo (2006) argued that misinformation given in laboratory experiments have little consequences. As a result, the individuals stating these fabrications will show very little indications of deception and will subsequently be less likely to have their integrity questioned. Therefore, in such settings, an increased level of credibility would not have any additional effect on influencing participants when they have no reason to doubt the honesty of their co-witnesses in the first place. It can be argued that in a more realistic eyewitness setting where some witnesses may have a plausible reason for exposing their co-witnesses to misinformation (such as to defend the suspect, whom they may be acquainted with), eyewitnesses will have more reason to question the credibility of their co-witnesses. In such circumstances, the credibility of an information source may have a significant effect on their level of influence on co-witnesses. Emulating this form of eyewitness deception in an experiment would be difficult; however, Dodd and Bradshaw (1980) found that individuals

were more likely to question the truthfulness of an eyewitness if they believed that witness had a motive to lie. The findings therefore suggest that despite the present study indicating that intelligence is a stronger predictor for co-witness influence than credibility, the credibility of a co-witness may still have a significant effect in circumstances where eyewitnesses have a legitimate reason to doubt the integrity of their co-witnesses. It must be acknowledged that although the present study considers and discusses the potential relationship between source credibility and co-witness influence, the present study was not able to reliably determine whether source credibility had any effect on the confederate's level of influence. This is because the variable was not directly measured. Moreover, although a police officer can be considered by most as having a high level of credibility, one can argue that a PhD student could also be perceived as being highly credible by most individuals.

10.5.3. Co-witness influence on confidence

Despite the results suggesting that misinformation from a co-witness was able to influence participants into changing their statements, further tests on confidence judgments indicated that the same exposure of misinformation did not have any effects on the confidence of participants who gave correct statements. Additionally, participants who gave incorrect statements did not seem to gain confidence after receiving confirmation from their confederate. These findings differ from existing research that indicates that eyewitness confidence can be influenced through co-witness discussions (Foster et al., 2012; Gabbert et al., 2003; Mudd & Govern, 2004). A key difference between the present study and the majority of previous research within the general literature of co-witness influence was that the current study purposely used a far more ambiguous task, with only 43% of the control group identifying the correct offender for starting the offence (see Table 10.1). The results from the control condition also indicate that only 17.4% of the participants were unable to blame one of the suspects for committing the crime. The researchers suggest that the ambiguity of the task will have distorted the participant's ability to assess how confident they were in their judgement. Further, it was suggested that the use of a five-point Likert scale will have allowed the majority of participants to give a confidence score of three as a safer answer to indicate their uncertainty towards how confident they felt. This can be seen in Table 10.2, where the mean confidence scores within all conditions ranges from 2.71 to 3.43. Therefore, the confidence scores given by participants within the present study may not have been accurate representations of their true beliefs in their judgments. A direction

for future research will be to use an evenly distributed Likert scale (i.e. one to six) in order to influence participants into giving a clearer indication of their confidence.

10.5.4. Limitations and directions for future research

While the study represents a step forward towards understanding the cognitive thought processes behind co-witness conformity, it still bears several limitations that should be addressed by future research. The present study found that participants were more likely to conform to co-witnesses who were perceived as having a high level of intelligence. This was attributed to the participants believing that the co-witness was more likely to be correct than themselves. However, the participants' perceptions of their own intelligence were ignored in the analysis. A fruitful direction for future research would be to measure the perceived intelligence of the information source relative to that of the participants; by doing so, subsequent analysis will allow researchers to gain a more accurate indication of the effects co-witness intelligence has on co-witness influence.

A second limitation of the study was the way in which co-witness intelligence and authority was represented. Although existing research suggests that the indicators (education and occupation) used to manipulate these variables will have been moderately accurate (Garrido et al., 2004; Williamson et al., 2013), individual differences in the participants' attitudes towards these characteristics may have influenced their perceptions of the co-witness's level of intelligence and credibility. It could be argued that many participants may have perceived a PhD student as also having a high level of authority. Future research can measure the accuracy of these indicators by asking participants to rate the intelligence and authority of their co-witnesses after the experiment. However, a counter-argument for this intervention is that the participants' perceptions of their co-witnesses might consequently be affected after being exposed to false information by them.

Finally, the study did not include a condition where the confederate was ostensibly just a police officer. This condition would have allowed the researchers to determine whether the effects of high authority would have a greater impact on co-witness influence than high intelligence. Although the findings suggest that increased authority had no additional impact on co-witness influence, it cannot be definitively concluded that this suggests that intelligence was more influential than authority. In addition, it could be

argued that the participants may have deemed the PhD confederate as having a higher level of authority due to having a higher status on the academic hierarchy. This would have meant that the both factors (authority and intelligence) will not have been compared in a fair and controlled design.

10.5.5. Conclusion

To conclude, this study aimed to determine whether eyewitnesses would use available information about their co-witnesses to gauge the validity of their statements. The findings indicated that participants' own recollection were more easily influenced by co-witnesses who were perceived as being highly intelligent due to higher pressures of informational influence. The credibility or authority of the information source, however, did not have any additional influence on eyewitnesses' judgements. This may be due to the laboratory-based design of the experiment, as participants did not have any reason to question the integrity of their co-witnesses and, thus, an increased level of credibility would not be likely to have a significant effect on participants. However, in circumstances where a co-witness would have a reason to confabulate information, the credibility of an information source may have a greater influence on others.

Chapter 11: General Discussion

11.1. Introduction

The present thesis developed a novel experimental paradigm that would allow the effects of co-witness discussions on blame attributions of individual eyewitnesses to be observed. This was done through using an ecologically-valid procedure that simulated the process of witnessing a crime and the subsequent act of engaging in a post-event discussion with other co-witnesses (participants). Across all four studies, participants were placed into different sized groups ranging from one (control) to six individuals, depending on the experimental condition. The groups of participants were then presented with a video footage of a fight breaking out between two customers within a bar, the video showed a man in a dark green t-shirt initiate the fight by attacking another man in a yellow t-shirt. Through the use of confederates, disguised as participants, the studies were able to present the true participants with misinformation about the incident. To be specific, the confederates were instructed to suggest that the man in the yellow t-shirt had initiated the fight by attacking the man in the dark green t-shirt first. Afterwards, the participants were individually interviewed in a private room and were asked to determine and recall who they believed had started the fight and were also asked to provide a confidence rating (with the exception of study 3, where no confidence rating was recorded). By comparing the rates of false blame attribution between the experimental conditions and the control group (acting as the base rate of blame attribution accuracy), the studies could determine whether the post-event discussions with the misleading co-witnesses (confederates) had influenced the participants' blame attributions; allowing the research to establish a measure of blame conformity. The paradigm enabled the creation of an artificial environment that resembled two real-life situations that could occur after a criminal incident. Firstly, the procedure simulated the process of a post-event discussion occurring between co-witnesses. Secondly, the procedure simulated a scenario where eyewitnesses could encounter false information from one (or more) of their co-witnesses.

The procedure had similarities with the experimental 'social contagion of memory' paradigm of Roediger et al. (2001), in that both studies used confederates disguised as participants to present the true participants with misleading information during a post-event discussion. However, the present procedure differed from the latter in three ways. Firstly, the social contagion of memory paradigm used still pictures of household scenes (e.g. a

kitchen or a bathroom) as the visual stimuli. Roediger and colleagues (2001) were concerned with observing the process of general memory conformity and were not interested in its applied applications to crime eyewitnesses; therefore, their choices of visual stimuli were justifiably suitable for the nature of their study. However, the present study wanted to emulate the process of witnessing a crime in the most ecologically-valid manner. Therefore, the choice of stimulus was changed from still images of household scenes to a footage of a real crime. Secondly, Roediger and colleagues observed the effects of group discussions on participant pairs only, whereas the present work observed the effects of co-witness discussion on various group sizes, to allow for more generalizable data to be produced. Finally, Roediger and colleagues observed the effects of group discussions on general memory conformity using tasks that involved recalling items from a scene, whereas the present study looked more specifically at whether a co-witness discussion could evoke blame conformity. Blame conformity is a sub-form of memory conformity, where an individual conforms to the blame attribution of another individual (Thorley, 2015). This task would test the participants abilities in both memory recall as well as their ability to attribute blame based on the information recalled. The present thesis argued that this form of memory conformity could be more specifically linked to false convictions and, thus, it should be studied directly. Although both processes deal with an individual's tendency to conform to the memory report of someone else, it was the contention of the present thesis that blame conformity would be a far more cognitively facilitated process than general memory conformity. Overall, the experiments conducted throughout the present work were used as an improvement and development from the previous paradigms incorporated by previous studies on co-witness influence (reviewed in Chapter 3). Moreover, the procedures used within the present study enabled the salient factors that could influence an eyewitness's susceptibility to co-witness influence when attempting to attribute blame to be determined. The main findings of the empirical studies from the present thesis will be summarised below, and subsequently discussed in regard to their theoretical and practical implications.

11.2. Summary of main findings

All four studies were able to consistently demonstrate that a proportion of the participants who engaged in a post-event discussion with their co-witnesses were susceptible to blame conformity. More specifically, the studies demonstrated that the erroneous judgement of one co-witness could influence the judgement of another, and this would subsequently lead to many participants blaming the wrong person for the incident. However, one thing that was apparent was that the co-witness discussions only had a

significant effect on co-witness influence under certain conditions. In addition, it was demonstrated that some participants would be more susceptible to co-witness influence than others. The findings of the present study with regards to these internal and external factors are discussed below.

The results indicated that both male and female participants were equally as likely to be influenced by misleading co-witnesses. Despite some research suggesting that females would possess greater abilities in memory recall (e.g. Megreya et al., 2011; Rehnman & Herlitz, 2007; Seidlitz & Diener, 1998; Smith, 1966; Washlin et al., 1993), the present findings suggest that these superiorities did not transfer onto reducing their susceptibility to co-witness influence. Similarly, despite the vast majority of literature on age and memory suggesting that elderly individuals would possess poorer memory recall abilities, relative to younger individuals (Adam-Prince, 1989; Dodson et al., 2007; Memon et al., 2003; O'Rourke, et al., 1989; Searcy et al., 1999), the present thesis found no significant differences in susceptibility to blame conformity and age. As previously contended by Gabbert et al. (2003) and Gabbert (2004), the results indicate that an individual's susceptibility to blame conformity does not seem to bear a simple relationship to memory recall accuracy (i.e. individuals with poorer memory being more susceptible to having their memory reports influenced). Instead, the absence of such a relationship would suggest that co-witness influence would therefore, be influenced by factors other than the quality of the eyewitness's memory recall pathway. Therefore it could be suggested that blame conformity is a process that is more likely to be a product of social and behavioural processes rather than processes relating to memory recall pathways. Interestingly, when looking at the participants who had produced a false blame attribution after encountering misleading co-witness information, the results found a weak, but nonetheless, significant relationship between the eyewitness's gender and their level of confidence. The findings suggested that male eyewitnesses were significantly more likely to gain a false sense of confidence in their erroneous judgement, after encountering confirmatory information from a co-witness. There were no observed age or gender related differences in the confidence of participants who refrained from conforming to their co-witness's misleading information.

Despite the results suggesting that the age and gender of the participants had no effect on their susceptibility to blame conformity, the second study was able to identify a different internal factor that did seem to accurately predict the suggestibility of an individual to co-witness misinformation: their personality traits. More specifically; using the FIRO-B assessment, the second study identified a significant relationship between wanted control and susceptibility to co-witness influence. Individuals who scored higher on the wanted control score were significantly more likely to blame the innocent suspect, after

encountering similar misinformation from the confederates. Although the observed effect size was relatively small ($d=-.06$), the results still indicated that a distinct significant relationship existed between an individual's level of wanted control and their susceptibility to blame conformity (N.B. wanted control refers to an individual's need to have their actions controlled by others, rather than control the actions of others). The results also identified a significant a negative relationship between wanted control scores and eyewitness confidence in both participants who made incorrect ($r=-.24$) and correct ($r=-.36$) responses, after a post-event discussion. The results suggested that eyewitnesses with high levels of wanted control were more likely to lose confidence in their blame attribution after discussing the event with their co-witnesses. Due to the results indicating that both incorrect and correct participants were likely to lose confidence, it is suggested that the individuals with high levels of wanted control will have been likely to be influenced more by disconfirmatory feedback rather than confirmatory feedback. Potential explanations for this behaviour is discussed below in the general discussion of the results (chapter 11.3). None of the other FIRO-B scales were able to accurately predict co-witness suggestibility. Although a small relationship was observed between expressed inclusion scores and correct blame attributions (relative to unsure responses), this is suggested to have been a statistical artefact, due to the relationship not being consistently observed as well as a very weak effect size ($d=-.09$).

As well as internal predictors of co-witness suggestibility, multiple external factors that could reliably predict a targeted individual's susceptibility to co-witness influence were also identified. The fourth empirical study compared the group similarity scores in blame attribution between participant groups (of five) who either discussed the event with participants that they shared a pre-existing relationship with; participants who they were unfamiliar with; or they were grouped with unfamiliar participants and were prohibited from discussing the event (control condition). The findings indicated that the participants within each group were more likely to produce similar statements (with regards to blame attribution) if they shared a pre-existing relationship with one another. Conversely, the study found no significant differences in the level of similarity in blame attributions between groups of unfamiliar co-witnesses who engaged in a post-event discussion and participants from the control condition. The findings suggest that the groups of co-witnesses who would initially hold contradicting views to one another would only be likely to come to a unanimous consensus, if the co-witnesses shared pre-existing relationships with each other. The third study also inspected the accuracy of the individual participant's blame attributions within the three conditions to determine whether a co-witness discussion would have a negative or positive impact (if any at all) on the accuracy of the participant's blame attributions, when no misinformation was deliberately planted in the group. The findings indicated that there

were no proportionate changes in incorrect or correct responses between the experimental conditions, suggesting that a co-witness discussion with strangers or familiar individuals did not seem to have any effects on the accuracy of their blame attributions. The study did, however, find that the number of uncertain responses was significantly lower when the participants discussed the event with familiar co-witnesses, with higher rates of correct and incorrect responses. This suggested that uncertain individuals would be the most susceptible to co-witness influence, an observation that lies in agreement with previous research on co-witness influence (e.g. Zajac and Henderson, 2009), and with the general theoretical construct of informational influence (Suls and Wheeler, 2000).

Although the findings from the third study indicated that familiar eyewitness groups were more likely to produce similar answers in comparison to unfamiliar co-witness groups, this was not to say that eyewitnesses could not be influenced by unfamiliar co-witnesses. Conversely, there was evidence suggesting that eyewitnesses could still be influenced by an unfamiliar co-witness if they perceived them as being likely to be accurate (Kwong See, Hohhman and Wood, 2001; Thorley, 2015). To demonstrate this, the fourth study observed the effects of co-witness discussions on eyewitness pairs. Depending on the experimental condition (4 independent conditions) participants were either paired with a confederate who was presented as being highly intelligent (PhD student), a confederate who was presented as being highly intelligent and authoritative (PhD student and police officer), a confederate with no indication of intelligence or authority level, or the participants completed the study individually (control). After discussing the witnessed incident with their assigned confederate, the results indicated that participants who were either introduced as being intelligent or intelligent and authoritative were significantly more likely to influence the participant's blame attribution when compared to the confederates with no indication of education or authority level. The results found that there were no significant differences in blame conformity rates between the participants who were exposed to a confederate with high intelligence and authority and participants who were exposed to a confederate with only high intelligence. The results suggested that the perceived intelligence of the participant had a greater mediating effect on co-witness influence than their perceived authority or credibility. The study failed to find any significant relationships between the perceived intelligence or authority of the confederate and their impact on the participant's confidence.

The majority of research studies on co-witness influence had observed the behaviour on eyewitness pairs (e.g. Gabbert et al., 2003; French et al., 2008; Hope et al., 2008; Kieckhaefer and Wright, 2014). It was suggested that observations on co-witness influence through traditional two-person paradigms would provide an unrealistic estimation of the

true risks of co-witness influence within real criminal investigations. This was due to the literature indicating that there would often be more than two eyewitnesses present during a criminal event (Paterson and Kemp, 2006a). Therefore, study 1b (Chapter 7) investigated the effects of both misinformation size and unanimity of misinformation, in order to determine whether the effects of co-witness influence were applicable to different real-life scenarios involving various group sizes. The results indicated that misinformation from an individual confederate did not seem to influence the blame attributions of the participants. This partly lay in agreement with the findings from study 4 (mentioned above), where the results indicated that a single confederate would not have a significant influence over the participant, unless presented as being highly intelligent or authoritative. The findings suggest that an individual misinformation source would not have a significant effect on the co-witnesses, due to the participants having no reason to believe that the confederate was accurate. However, the study did find that blame conformity was prevalent when participants were presented with misinformation from a group of unanimous confederates. With regards to misinformation size; the results suggested that there was a significant increase in false blame attribution rates when the confederate size was increased from two to five (see Tables 8.3 and 8.5). However, the effect size of this increase was weak ($\phi_c = .19$), suggesting that the unanimity of misinformation was a greater mediator of blame conformity than the misinformation size. As Figure 9.1 illustrates, the greatest increase in false blame attribution rate was evoked with the addition of the second confederate, suggesting that creation of a majority group would have the biggest impact on co-witness influence. In regard to eyewitness confidence (after a post-event discussion), the results found no significant relationships between either of the independent variables (misinformation size and unanimity of misinformation) and eyewitness confidence.

11.3. Discussion of main findings

Blame conformity is a form of memory conformity which refers to a psychological process where an eyewitness is influenced by another co-witness when attempting to determine which person from the incident is to blame (Thorley & Rushton-Woods, 2013). Up until recently, the majority of memory conformity studies had only observed the effects of co-witness influence on an eyewitness's ability to report items that they remembered seeing (e.g. Carlucci et al., 2010; Davis & Meade, 2013; Roediger et al., 2001; Wright et al., 2000). Although some studies on memory conformity may have included a question regarding blame attribution, the majority of the questions asked regarded the characteristics of insignificant items from an event. Such studies were able to demonstrate

how eyewitnesses could be influenced into erroneously reporting seeing unseen items which could consequently lead to investigators receiving misleading details such as the number of accomplices - as found in the Oklahoma bombing incident (Wright et al., 2000), or the characteristics of a witnessed suspect - as evident in Anna Lindh's murder investigation (Granhag et al., 2005). However, in relation to miscarriages of justice; such occurrences would not be directly linked with the false conviction of an innocent bystander. It can be argued that false information provided by witnesses about a suspect's characteristics could consequently contribute to the false imprisonment of an individual; however, this inference does not explain how a group of eyewitnesses could misinterpret how an incident unfolded and mistakenly blame a bystander who was present during an incident for committing the crime.

Thorley (2015) studied the effects of co-witness influence on an individual's blame attribution, directly. Although the study did not observe the effects of co-witness influence through a co-witness discussion (participants were presented with a previous a participant's statement, instead), the study was able to demonstrate that participants could be influenced by a co-witness into blaming an innocent bystander who had been present during the incident, but had not committed the crime. Although research had observed the effects of co-witness on an eyewitness's blame attribution, very little research had attempted to investigate the moderating factors that could increase or decrease an individual's susceptibility to blame conformity. A large body of previous research had identified numerous moderating factors in relation to general memory conformity. However, there were many discrepancies between previous research studies. Furthermore, it was argued that, unlike a standard memory recall task, the process of attributing blame is significantly more cognitively demanding. Moreover, it is a decision-making process that not only requires the witness to recall the event, but also requires them to interpret the information correctly in order to deliberate which potential suspect is at guilt. Due to the heuristic nature of blame attribution, it was suggested that the internal and external predictors of general memory conformity may not share the same relationship with blame conformity. For that reason, a central focus of the thesis was to determine whether the same relationship between co-witness discussions and general memory conformity would be present with blame conformity.

Comparisons between the present findings and the previous research on memory conformity indicated that blame conformity and memory conformity shared similarities in the way that they were moderated by internal and external factors. Both forms of co-witness influence could be predicted through the personality traits of the targeted eyewitnesses, both seemed to be more effective when the misinformation was presented

unanimously, and the present findings seemed to lie in agreement with the pre-existing literature in demonstrating that similar characteristics of the misleading co-witness would impact how influential they were.

11.3.1. Are the effects of co-witness discussions necessarily negative?

Despite the results indicating that eyewitnesses were susceptible to incorporating their co-witness's false information, these observations were only observed when participants were deliberately presented with erroneous co-witness information. Roediger et al. (2001) described such observations as being 'one-sided', due to only emphasizing on the negative effects of social influence. In reality, misinformation is not always presented during a co-witness discussion. Therefore, the effects of co-witness discussions on the blame attributions of participants when no confederates were present were also observed. The results indicated that participants were still susceptible to blame conformity; however, there was no evidence suggesting that this led to a significant increase in false blame attributions. The results indicated that among the participants who had engaged in post-event discussions (when no confederates were present) there were more cases of both false and correct blame attributions and fewer cases of uncertain responses, in comparison to the control groups (no group discussion). However, the ratio between correct and incorrect blame attributions remained relatively constant between the control and experimental conditions. This suggested that many of the uncertain co-witnesses will have conformed to both correct and incorrect co-witnesses. The findings indicate that although blame conformity can occur, it does not necessarily mean that it will have a negative impact on the accuracy of the eyewitnesses' recollections. However, it can still be argued that many of the uncertain individuals who conform to a co-witness will still be reporting unwitnessed information to investigators, be it accurate or inaccurate. Moreover, eyewitness testimonies are required to be independent and only based on the witness's experiences during the incident (Forbes, 2003; Heaton-Armstrong, 1987). Therefore, any reports that have been made with the help of co-witness information (be it correct or incorrect) should be classed as unreliable evidence and omitted from the court case.

The British Psychological Society (2007) set out a series of guidelines for the UK Home Office which advised police forces to ensure that their officers would separate multiple eyewitnesses apart from each other. The guidelines also recommended that the officers should attempt to determine whether or not the co-witnesses had discussed the event with each other, in order to establish whether their reports were independent or influenced. The

present thesis supports the aforementioned guidelines, due to the present findings demonstrating how easily the originality of an eyewitness's account can be compromised after a co-witness discussion. However; despite such regulations being put in place, reports have suggested that many police officers will refrain from separating eyewitnesses, due to not believing in the risks associated with co-witness discussions (Paterson and Kemp, 2005). Additionally, eyewitness surveys have found that many officers will encourage witnesses to discuss the event with their co-witnesses and even give their statements collectively (Paterson and Kemp, 2006a). It is argued that policing organisations should make more effort in ensuring that their officers adhere to these regulations. Police officers should be educated on the risks of co-witness influence and interventions should be put in place to prevent officers from avoiding such practises. Additionally, it is proposed that police investigators and legal professionals should encourage eyewitnesses to not report information that they may have been previously uncertain about. However, although inferred, there is no evidence indicating that such an intervention technique would be effective in helping eyewitnesses improve their blame attribution abilities. Moreover, this could result in valuable evidence being omitted.

11.3.2. Gender and age-related differences

The absence of any gender or age-related differences being observed in co-witness suggestibility suggests that an eyewitness's susceptibility to blame conformity would not be related to the quality of their memory for the incident. Similar inferences were made for memory conformity by Gabbert (2004). This inference is made under the presumption that age and gender differences existed in memory recall, as suggested by a large body of existing research (see Dodson et al., 2007; Memon et al., 2003; Megreya et al., 2011; Rehnman & Herlitz, 2007; Seidlitz & Diener, 1998; Smith, 1966). The present study failed to control for memory recall quality directly; therefore, the assumption that gender and age related-differences in memory recall exist rest completely on the findings of previous empirical research. One possible explanation for why blame conformity would not bear a relationship with memory recall quality is that the act of blame attribution may not be heavily reliant on an individual's memory retrieval skills. When faced with the task of attributing blame to the correct suspect, participants will be more reliant on their cognitive and moral reasoning abilities (Devine, 2012; Devine et al., 2001). Research has shown that, on average, men and women perform similarly on such cognitive reasoning tasks (Blumenthal, 2005). As a result, it could be suggested that an individual's cognitive

reasoning skills may be able to predict their susceptibility blame conformity during an eyewitness investigation far more accurately than their memory retrieval skills could.

Further, despite research suggesting that gender and age-related difference in memory recall quality existed, for this to have an impact on an eyewitness's susceptibility to co-witness influence, the individual would have to be aware of their inaccuracies for them to become dependent on the reports of their co-witnesses. The results from the control groups indicated that there were no gender or age-related differences in the participant's confidence when attributing blame. Therefore, even if age or gender-related differences in memory accuracy did exist, the participants will not have been aware of this and, thus, would have been equally susceptible to informational influence. A common misconception to make would be to assume that eyewitnesses who are less competent in producing an accurate memory report would be most susceptible to being influenced. However, the present work was able to identify additional factors unrelated to the individual's competence that could render them more vulnerable to co-witness influence.

11.3.3. Personality correlates of co-witness suggestibility

Using the FIRO-B assessment, wanted control was identified as an accurate predictor of co-witness suggestibility. Individuals who scored high on the wanted control scale were significantly more susceptible to blame conformity and were also more likely to lose confidence in their own blame attributions after a co-witness discussion. Some interesting inferences were drawn from these findings. Firstly, the results indicated that individuals with a high level of wanted control were more likely to present investigators with misleading information, if it was suggested to them by a co-witness. Additionally, the results suggested these individuals would be more likely to lose confidence in their statements, after engaging in a post-event discussion with their co-witnesses. On one hand, this could suggest that the conforming witnesses would be less confident in their judgements which could deter them from giving false evidence in court. However, the findings also suggest that eyewitnesses with high levels of wanted control may also be less confident when giving correct statements, which could not only deter them from giving evidence in court, but could also influence the jurors in perceiving the witness to be unreliable (Brewer & Burke, 2009).

The relationship between high wanted control scores and co-witness suggestibility was attributed to the submissive nature of these individuals and their reduced levels of self-esteem (Gilbert and Allan, 1994; Schutz, 1958). Research suggest that individuals with submissive tendencies would be more likely to exhibit perceptions of inferior social rank and

are therefore, more likely to conform to those that they perceive as being more powerful (Gilbert, 1993). This would suggest that even if an eyewitness had a very accurate memory recollection of the event, exposure to misleading information from other co-witnesses would be likely to reduce their confidence and potentially motivate them to conform to the misinformation.

Owing to these findings; it is suggested that practitioners within the criminal justice system should consider such personality traits when assessing an eyewitness's testimony. If jurors and police investigators were to use an appropriate assessment to measure the witness's level of wanted control and other indicators of submissiveness, they would have access to more resources for gauging the reliability of the individual's statement. However, owing to the weak effect size between wanted control and co-witness suggestibility, such interventions may not prove to be effective. It is also important to acknowledge that such an assessment would have to be used in conjunction with other evidence when assessing the reliability of a witness. Otherwise, the investigators would run the risk of making false inferences. As mentioned previously, an eyewitness's level of confidence can influence how the jurors will perceive their testimonies. This is worrying because the present study demonstrated that many eyewitnesses who engage in post-event discussions will lose confidence in their reports, even when giving a correct testimony. As a result, it is suggested that jurors should be instructed not to use the confidence of eyewitness's as an indicator of accuracy or reliability, especially considering the large body of additional research which suggests that confidence is not a reliable predictor of eyewitness accuracy.

11.3.4. Co-witness familiarity

Despite evidence suggesting that the majority of co-witnesses would have pre-existing relationships (Paterson et al., 2007), the majority of previous research had investigated the effects of co-witness influence on pairs of participants who were strangers to each other (e.g. Gabbert et al., 2003; Gabbert et al., 2004; Meade & Roediger, 2002). The present work produced evidence to suggest that such observations would produce an inaccurate representation of real co-witness discussions. The third study (Chapter 9) found that statement similarity between larger groups was significantly more likely when the co-witnesses had pre-existing relationships with each other, but was unlikely if they were strangers. This was mainly attributed to the habitual tendency of individuals to spend less time questioning the credibility of those that they are familiar with (Hope et al., 2008). Additionally, it was suggested that the development of transactive memory systems

between groups of friends would allow them to concordantly dictate who they would be conforming to. In the Oklahoma bombing incident where one witness (Tom Kessinger) had influenced the statements of two others, all three co-witnesses were colleagues with pre-existing relationships. The question therefore arises; had the co-witnesses been strangers to each other, would the co-witnesses have still conformed to the misleading suggestions of Kessinger?

Through these observations, it is proposed that both investigators and jurors should consider the relationship between the co-witnesses when evaluating their statements. If there were to be discrepancies within the statements of a group of co-witnesses, investigators could consider which co-witnesses shared a pre-existing relationship with each other in order to determine whether any of the statements were more likely to have been influenced through post-event information.

11.3.5. Perceptions of the information source

The literature on memory conformity suggests that individuals could incorporate misinformation through both intentional processes (i.e. informational influence; Hope et al., 2012) and also unintentional processes (source monitoring errors; Greene et al., 1982; Jacoby & Kelley, 1992; Morgan et al., 2013). With regards to the present work; due to latent nature of suggestibility, it was hard to accurately determine which process would be the predominant facilitator of blame conformity during a post-event discussion. However, within the final empirical study (Chapter 10), it was demonstrated that the act of blame conformity was, in fact, a very conscious process in which the eyewitnesses would choose whether or not to conform to a co-witness. The study did not eliminate the possibility of blame conformity being driven by source monitoring errors and it can be agreed that some participants may have incorporated the confederate's misinformation unintentionally through such processes. However, there were multiple reasons suggesting that the main cause of blame conformity will have been social influence. Firstly, the experiments used within the thesis did not issue the participants with filler tasks between witnessing the event and reporting who was at fault. Therefore, participants will have been likely to have had a good memory of the event and would have been significantly less vulnerable to misattributing the post event information as witnessed information. Secondly, blame conformity was only observed when the confederate was presented as being highly intelligent or authoritative. When the confederate did not indicate their level of intelligence or authority (condition 2), the results found no significant differences in blame attribution

rates in comparison to the control condition. Source monitoring errors should not be affected by the characteristics of the information source. Therefore, if source monitoring errors had facilitated blame conformity, condition 2 would have had a significantly higher rate of false blame attributions in comparison to the control group, however, this was not evident.

The final study also indicated that eyewitnesses would be more likely to conform to a co-witness if they perceived them as being highly intelligent. This relationship was attributed to the individuals believing that the co-witness would be more likely to be correct and, thus, becoming more susceptible to informational influence. Additionally, it was found that after controlling for perceived intelligence, the perceived authority and credibility of an information source seemed to have no additional impact on their level of influence over their co-witness. It was suggested that heightened authority would not have much of an influence on the eyewitnesses, due to their statements being made privately. Moreover, the findings suggest that eyewitnesses would be more concerned with the competence of a co-witness rather than their credibility, when deciding on whether to conform. This inference was also supported by the observations of Thorley (2015). However, as discussed in Chapter 10, source credibility may have had little impact due to the participants having very little reason to doubt the truthfulness of another participant. It can be argued that after a real criminal incident, some witnesses may have a plausible reason for exposing their co-witnesses to misinformation (such as to defend the suspect, whom they may be acquainted with). Resultantly, eyewitnesses will have more reason to question the credibility of their co-witnesses. In such circumstances, the credibility of an information source may have a significant effect on their level of influence on co-witnesses.

11.3.6. Misinformation size and unanimity

The results from study 1b found that a post-event discussion with one confederate had no effect on the blame attribution accuracy of the participants, in comparison to the control condition (no discussion permitted). The findings suggest that blame conformity would require multiple co-witnesses to be presenting the targeted individual with misleading information. Study four demonstrated that a singular source could influence the blame attribution of an eyewitness; however, this effect was only observed when the information source was presented as being exceptionally intelligent or credible. Collectively, the studies suggest the risk of blame conformity to one co-witness would be relatively low, an inference

that contradicts with a large body of previous research on memory conformity (c.f. Foster et al., 2012; Hope et al., 2012; Roediger et al., 2001). More specific research on blame conformity has also suggested that eyewitness's can conform to the misleading statement of one co-witness. This difference was attributed to the ambiguity of the experimental task that was used within the present studies. The task of identifying which individual had thrown the first hit was difficult and ambiguous, due to the physical confrontation erupting unexpectedly and very quickly. Therefore, the participants would have been likely to believe that their co-witness would have faced similar levels of difficulty as them. Because of this, the participants may have been more likely to believe that their co-witnesses were vulnerable to making errors and, thus, will have been more inclined to reject the misinformation of a singular co-witness, perceiving it as an idiosyncratic error.

The results from multiple studies within the thesis (studies 1 and 2) indicated that the rate of blame conformity significantly increased when additional confederates were present. The findings indicated that eyewitnesses would be significantly more vulnerable to blame conformity when exposed to misinformation by a group of co-witnesses. The findings lay in agreement with previous research on memory conformity (e.g. Walther et al., 2002). Moreover, the results indicated that after the addition of the second confederate, additional confederates had a smaller impact on the group's level of influence over the targeted participants. The findings suggested that the unanimity of misinformation was more influential on blame conformity than the actual size of the misinformation source. However, it was concluded that further research was needed to determine whether a majority group would still have similar impact on co-witness influence if the misinformation was not unanimously held by all co-witnesses (i.e. multiple dissenters against a misleading majority).

Two main implications were drawn from study 1b. A theoretical implication from the study suggested that previous research which had typically observed the effects of co-witness influence on participant pairs will have produced inaccurate estimations of the true prevalence of co-witness influence during real co-witness discussions. This was because eyewitness surveys indicated that on average there would be over six co-witnesses present during an incident and as the study demonstrated, the level of co-witness influence between a group size two and six would significantly differ. As a result, it is argued that the effects of co-witness discussions should be measured in different sized groups so that the findings could possess greater external-validity. A more practical implication of the findings suggested that the risks of one individual contaminating the blame attributions of a group of co-witnesses during a post-event discussion would be relatively low. This is because the

results indicated that for blame conformity to be effective, the misinformation would have to be presented unanimously or at the very least, by the majority of the group.

11.3.7. Confidence as a measure of co-witness influence

The present study used the self-reported confidence scores of participants as an additional measure of co-witness influence. This measure was implemented after previous research had indicated that many eyewitnesses who did not conform to a co-witness could still be influenced by losing confidence in their own reports (Luus & Wells, 1994). Additionally, research had also indicated that individuals who would already hold an erroneous report of an incident could gain more confidence in their false judgement if confirmatory information was presented to them by a co-witness (Allwood et al., 2006; Semmler et al., 2004). However, results indicated that the participants' self-reported confidence scores did not seem to bear a clear relationship with co-witness influence. The only significant findings that were found using the confidence scores were that male eyewitnesses would be more likely to be overconfident in their false reports after exposure to misinformation and that eyewitnesses with high levels of wanted control would be likely to lose confidence in their reports, after a post-event discussion with co-witnesses. Although the observed relationships were significant and valid, they were also weak in effect size. Other than these observations there were no other links between confidence levels and co-witness influence. The insignificant observations could be attributed to a methodological flaw in the way that the confidence scores were analysed. Due to the theoretical design of the studies, participants who had produced their responses through conformity (where confidence may not have been affected) and participants who had produced their responses through their own choice or through source monitoring errors (where confidence would not be affected) could not be differentiated.

Thus, a direction for future research would be to incorporate a more appropriate design with greater internal validity, which would allow the confidence scores of participants to represent co-witness influence more reliably. One way such a design could be implemented is by recording the responses of participants before and after they had engaged in a post-event discussion. However, such a design would run the risk making the participants become more aware of the post-event information, which could affect their final responses.

11.4. Real life applicability of findings

Although implications and practical applications can be drawn from the empirical studies presented here, there are numerous factors from real criminal incidents that cannot be emulated within a laboratory simulation. Consequently, these caveats question the external validity of implications drawn from the present observations. The caveats relating to the real-life applicability of the findings are discussed below.

Perhaps the hardest element of a real criminal incident recreate within an experiment is the induced levels of shock and fear that can be inflicted onto an eyewitness during criminal incidents that involve violence or danger. Researchers have argued that higher levels of stress during an incident can have a negative impact on an eyewitness's focus during the incident and consequently distort their memory of the event (Deffenbacher et al., 2004; Dysart et al., 2002; Roebbers & Schneider, 2000; Tuckey and Brewer, 2003; Wells et al., 2000). This could potentially cause the eyewitness to become more reliant on external sources to make sense of the incident and reconstruct the event. Participants from the present experiments viewed the incidents through a monitor screen. They were fully aware that there was no danger to their safety and as a result, they would not have been affected by the same kind of emotional stress. An attempt to create and match a false sense of shock or fear would not only be highly impractical and difficult, but would also break multiple ethical codes of practise (as set out by the BPS Code of Human Research Ethics, 2011).

It is also impossible to replicate the real-life implications associated with eyewitness statements. After a real criminal incident, eyewitnesses will be fully aware of the implications that their statements will have to the investigation, in helping convict the correct offender (Williamson et al., 2013). Additionally, police officers are perceived as authoritative individuals (Garrido et al., 2004; Jackson et al., 2012; Williamson et al., 2013). As a result, witnesses who are interviewed by an officer may be more likely to exhibit compliant tendencies towards them and, thus, may exhibit a greater pressure to perform (Bushman, 1984). Within an eyewitness experiment, participants will be likely to assume that there is a correct answer of which the interviewer would be aware of and, as a result, participants may be more inclined to conform if they think that the interviewer will be able to determine whether they are correct or not. During a real incident, the police officers understanding of the event may be incomplete and, as a result, participants may be less likely to conform if they think that the officer would not know whether they are correct or not. This suggestion is supported by previous research; Insko et al. (1985) found that the misinformation was more influential when the respondents believed that there was a

correct answer to the task, as compared to subjective tasks where there was no verifiable correct answer.

The consequences of providing false information to an interviewer are also significantly greater during a real police interview than during an experimental interview. During a real criminal investigation, eyewitnesses will be fully aware that a false blame attribution could consequently lead to the conviction and imprisonment of an innocent individual. As a result, eyewitnesses would be more cautious in accepting unwitnessed information from others. However, during the experiments from the present thesis, there were no serious consequences to providing a false blame attribution (other than the interviewer knowing that you were incorrect). As a result, the participants may have been more careless in their decisions to incorporate unwitnessed information into their final report.

Ultimately, the aforementioned implications from real-life investigations would be extremely difficult to replicate. One way of recreating a study with higher levels of ecological validity would be to adopt the methodological design of Areh (2011). Areh conducted a laboratory study on eyewitness accuracy. Participants were told that their answers would be used in a real investigation to identify the offender, inducing similar investigator effects that would be present during a real eyewitness interview. Overall, the study found similar results to other research which, like the present work, failed to recreate this real-life implication effect. However, such a design would involve a strong level of deception on the participants, which could generate ethical complications.

As discussed previously; participants who took part in the present study will have been very unlikely to believe that their co-witnesses would be purposefully deceiving. This is because, as far as the participants were aware, their co-witnesses would have no motivation to purposely lie to them during the discussion (Bond & DePaulo, 2006). As a result, they will have exhibited a truth bias when encountering the confederates' misinformation (Van Swol & Braun, 2015; Vrij, 2008). After a real criminal incident, an eyewitness could have a plausible reason for exposing their co-witnesses to misinformation (such as to defend the suspect, of whom they may be acquainted with). As a result, eyewitnesses may be more aware of potential dishonesty during a post-event discussion with other co-witnesses. Consequently, eyewitnesses from real incidents may, therefore, be more likely to question the credibility of their co-witness's statement and, thus, be more likely to reject their information. A fruitful direction for future research would be to incorporate a way to give some participants a motive to be dishonest. By making the rest of the participants aware of these potential motives, the participants may be less reluctant to assume that their co-witnesses are being truthful.

During all of the experimental trials (with the exception of the control condition), all participants were instructed to discuss the event with co-witnesses prior to giving their statements. Therefore, the subsequent results from these trials would be based on the assumption that every eyewitness from an incident would engage in a post-event discussion. In reality, there is no guarantee that all eyewitnesses will wish to discuss the event with co-witnesses. According to Paterson and Kemp (2006a), 14% of eyewitnesses will refrain from engaging in a co-witness discussion when there are additional co-witnesses present. A question that arises is whether the non-engaging co-witnesses possess distinct individual differences from the engaging co-witnesses. The FIRO-B indicates that individuals with high levels of wanted and expressed inclusion would be significantly more likely to interact with others (Rubin et al., 1988; Schutz, 1958). This could suggest that after a real criminal incident, eyewitnesses with higher needs for expressed and wanted inclusion may be more susceptible to co-witness influence due to being at a higher risk of encountering co-witness misinformation. Furthermore, the third empirical study of this thesis suggested that individuals with higher levels of wanted control would be more vulnerable to co-witness influence due to their submissive tendencies making them more susceptible to informational influence during a discussion. However, this was only observed when the participants were deliberately instructed to engage in a post-event discussion. Studies indicate that high levels of wanted control and submissive personalities are comorbid with an introverted personality (Gilbert & Allan, 1994; Schutz, 1958). Therefore, it is likely that after a real criminal investigation, individuals with high levels of wanted control may be less likely to engage in co-witness discussion due to their introverted tendencies and, as a result, may be less likely to encounter and incorporate the misinformation of their co-witnesses. If an eyewitness's tendency to engage in co-witness discussions is moderated by internal factors, this could suggest that the relationship between individual differences and memory/blame conformity may be different to what has been observed through traditional laboratory based observations (including the present studies). A suggestion for future research, to allow the participants to have control over their decision to engage in a discussion, is to present no instructions for a discussion. Instead, the experimenter can leave the room and let the participants dictate their own behaviour. However, multiple issues could arise from such a design. Many participants may assume that they are not permitted to discuss the event due to being in a laboratory. Conversely, they may assume that the allocated time after the footage has elapsed would be for them to discuss the event. Secondly, even if some participants choose not to discuss the event with others, they would still have to be present whilst the other participants discuss the event. Consequently, they will still be exposed to the information of those who do chose to discuss the event.

Despite some significant issues with regards to the real-life applicability of eyewitness research, it can still be confidently contended that eyewitnesses from real criminal incidents will be susceptible to co-witness influence. This has been demonstrated within numerous notable real-life cases of false witness testimonies, such as the misleading statements provided during the Oklahoma Bombing incident (discussed in Chapter 1-3). Furthermore; co-witness influence has been commonly observed after traffic accidents. Through the use of mathematical and physics-based calculations, traffic police have commonly disproven the collective statements of eyewitness groups. Traffic officers have stated that within real cases of motor-vehicle incidents, eyewitnesses will often agree on certain information about a witnessed event, which will often be incorrect (Gabbert, 2004). However; based on the existing differences between the experimental paradigms used by studies within the current literature and real-life incidents, it is proposed that - in the future - more realistic research may identify additional mediating factors that are associated with co-witness influence.

11.5. Limitations and directions for future research

As well as some general differences between the majority of eyewitness experimental designs (including those utilised in the present studies) and real-life crime incidents, the experiments presented here have several limitations that could be amended by future research. In addition, numerous implications have arisen from the present findings which could be built upon by future studies. Many of these limitations and suggestions are discussed within their respective empirical chapters (Chapters 6-10); however, some of the more general issues are discussed below.

11.5.1. No filler tasks administered

The present studies did not provide the participants with any form of filler tasks to complete during the interval between viewing the incident and providing a statement (blame attribution). Filler tasks have been commonly used by researchers when observing the accuracy of eyewitness memory (e.g. Echterhoff et al., 2005; Shaw, Bjork, & Handal, 1995; Smith, Kassin, & Ellsworth, 1989). The tasks often take the form of an unrelated cognitive reasoning task such as mathematical questions, and are used to divert the participant's attention away from the incident for a brief moment before they are

interviewed about the incident. Such tasks are used because during a real investigation, eyewitnesses are very rarely interviewed instantly after witnessing the event; interviewing can commence after several hours or even days (Horry, Memon, Milne, & Wright, 2012). Therefore, if an experiment allows participants to give a report instantly after viewing the incident, the participants would possess an unrealistic memory advantage in comparison to real eyewitnesses. Within the present studies, participants viewed the incident, discussed the event with their co-witnesses (excluding the control groups) and were then interviewed privately. Although this design meant that the participants will have possessed an unrealistically accurate memory for the incident, the absence of a filler task can be justified due to the nature of the present studies' observations. The present studies observed the blame attribution of participants to determine whether they had been influenced by their co-witnesses (blame conformity). As discussed previously; eyewitness conformity does not seem to bear a direct relationship with memory accuracy (Gabbert 2004; Gabbert et al., 2003). Instead, an individual's susceptibility to co-witness conformity seems to be predominantly driven by their individual differences in personality (Mojtahedi et al., 2017) as well as external factors such as the perceived characteristics of the co-witnesses (Betz et al., 1996; Forgas & Williams, 2001; Throley, 2015). Therefore, the quality of the participant's memory should not have an effect on their susceptibility to blame conformity. By ensuring that the participants had a good memory of the incident, any significant differences in false blame attribution rates within the experimental conditions could be more confidently attributed to co-witness conformity rather than memory errors.

11.5.2. Singular measure for blame conformity

The present study incorporated a single blame attribution task to measure blame conformity. Although the task was able to accurately simulate the process of eyewitness blame attribution, by relying on an independent response to measure the dependent variable of blame conformity, the internal validity of the findings could be questionable. This is because the blame attribution task only consisted of three potential responses (blaming the man in the yellow t-shirt, man in the green t-shirt, or responding as 'unsure'). As a result, many participants may have produced a response through guessing, due to there being a 50% chance of being correct. To avoid such potential risks, future research should present participants with multiple blame attribution paradigms, allowing the research to record a more reliable overall measure of co-witness suggestibility.

11.5.3. The time interval between witnessing an incident and giving evidence

As discussed above, many eyewitnesses may not be asked to provide a statement until several days after the incident (Horry et al., 2012); therefore, it would be interesting to observe the effects of co-witness discussion on participants several days after witnessing an incident. Although some evidence has suggested that memory conformity may not carry a direct relationship with memory accuracy (Gabbert 2004; Gabbert et al., 2003), Paterson et al. (2009) found that participants were more susceptible to memory conformity when being asked to give a statement two weeks after viewing the incident, in comparison to those who gave statements 20 minutes after viewing the incident. This could be due to the participants losing confidence in their own memory reports after the longer duration. Thus, a fruitful direction for future research would be to observe the effects of blame conformity after different time intervals, to gain an accurate indication of the relationship between time delay and susceptibility to blame conformity. Additionally, Paterson and Kemp (2006a) suggested that only 67% of participants who discussed the event with others, did so immediately after the incident. A large proportion of eyewitnesses reported discussing the event several hours-days after the incident. An interesting direction for future research would be to investigate whether the time interval between witnessing an incident and discussing it with others could have a moderating effect on an individual's susceptibility to co-witness influence.

11.5.4. Controlling for speaking order during the group discussion

During the present experiments, all confederates had received specific instructions on their role and were instructed to interact with the participants under a rigid set of guidelines (see Chapter 5). They were not, however, presented with any specific instructions regarding when to speak during the post-event discussion (i.e. whether to speak before or after the other group members). Instead, confederates were allowed to present their misinformation at any time during the discussion. This was done to create a more naturalistic environment, in order to prevent the participants from questioning the validity of the confederates as true participants. Secondly, with many of the experimental conditions incorporating multiple confederates, it would have been more difficult to provide each confederate with a specific order for speaking, whilst maintaining the false illusion of a natural discussion amongst true participants. However, failure to control for the order of

discussion could have had an extraneous effect on the results. Gabbert, Memon, and Wright (2006) demonstrated that the first speaker will have the greatest influence on the rest of the group. Therefore, if a true participant was first to speak, this could produce a significantly different outcome than if a confederate was first to speak. To control for this variable, future interviewers might provide the participants with instructions for a structured co-witness discussion. The instructions could then provide a specific order for the participants to state their judgements before engaging in a group discussion (i.e. 'please state who you believe threw the first hit in an orderly fashion, starting from the participant on the far right and ending on the participant on the far left').

11.5.5. Skewed sample size

For many of the studies, the experiments were conducted over the duration of a year, and were sequentially carried out in order of condition. However, this turned out to be an unreliable approach as the differences in experiment dates had a mediating effect on the availability of participants for each experimental condition. Many subjects who were allocated a later date dropped out of the study and did not turn up to the experiments. Resultantly, there were some disparities in sample size between the experimental conditions within studies one to three. This is acknowledged as a limiting factor to the study; however, despite this level of variance, all experimental conditions were still of sufficient size for statistical comparisons to be made (in accordance with Stevens, 2009).

11.5.6. Interviewing techniques

It was demonstrated that eyewitnesses could be influenced by their co-witnesses when attempting to attribute blame. Moreover, it was shown that this form of influence could result in innocent individuals being blamed for committing a crime. In regard to the progression of blame conformity research, proceeding studies should aim to identify and empirically test appropriate intervention techniques to reduce the risks of blame conformity during eyewitness interviews. Research has indicated that positive rapport building could help reduce an eyewitness's risk of reporting misleading post-event information (Kieckhaefer & Wright, 2014; Kieckhaefer, Vallano & Schreiber Compo, 2013; Vallano & Schreiber Compo, 2011). The findings suggest that certain interview guidelines such as the *Cognitive Interview* (Fisher & Geiselman, 1992) may be able to allow investigators to reduce

the risks of recording such influenced reports. Therefore, future research should aim to build upon the key findings from the current thesis by observing the effects of different intervention techniques in reducing the risks of blame conformity.

11.5.7. Recording the initial responses of participants before the group discussion

The present study only recorded the blame attribution and confidence of each participant once (after the group discussion had taken place for participants in the experimental conditions). The experiments did not record participants' responses both before and after the group discussions for multiple reasons. Firstly, it could be argued that the process of giving a statement of an event twice in a short space of time would lack ecological validity. This is because it would be unusual for a participant to give a statement both before and after discussing the incident with eyewitnesses at the scene, typically, investigators will only record the statements of eyewitnesses at the crime scene once — although eyewitnesses could be asked to give additional testimonies later on during the court proceedings. Secondly, a risk of making participants give responses both before and after a group discussion could be that participants would be more likely to suspect that the experimenter is attempting to observe their suggestibility to a co-witness discussion. Consequently, this could have an effect on a participant's second response, disrupting the internal validity of the experiment. However, the present project acknowledged that without recording the responses of participants both before and after exposure to co-witness misinformation, it is impossible to determine the exact number of participants who provided a false blame attribution through blame conformity and the number of participants who provided a false blame attribution through independent errors. Future research could potentially counteract these issues by collecting the responses of participants both before and after exposure to co-witness misinformation and use a post-manipulation check (where participants are asked afterwards if they suspected the experiment's true aims) to determine whether the participants' answers were affected by an expectancy bias.

11.5.8. Controlling for the participants' ethnicity and education

To date, there has been no evidence produced to suggest that the ethnicity of an eyewitness could have an effect on their suggestibility to co-witnesses or any other sources of post-event information. For this reason, the present study did not record or control for

the participants' ethnicity. However, the project acknowledges that there still could be some ethnic or cultural differences in an eyewitness's susceptibility to co-witness influence. This is because earlier cross-cultural studies on social conformity demonstrated that participants from collectivist cultures (such as China) were more likely to conform to a majority group due to the cultural norms within their communities favouring group compliance, in comparison to individualist cultures (such as the UK) (Bond and Smith, 1996). Although, the present experiments were carried out on individuals living in the UK, if the study had recruited participants who were originally from collectivist cultures, their cultural norms may have consequently influenced their responses. Secondly, research has demonstrated that during identification tasks, eyewitnesses can exhibit own-race biases, in that participants are more likely to recognise the faces of individuals of similar ethnicities (Johnson & Fredrickson, 2005; Meissner & Bingham, 2001; Wright, Boyd, and Tredoux, 2003). Due to the present studies' stimulus only involving suspects of African descent, it could be argued that participants of a similar ethnicity may have had an advantage in recalling the event and thus, may have been less reliant on their co-witnesses' information. However, it should be acknowledged that research has only demonstrated the existence of own-race biases during eyewitness line-up identification and not during eyewitness memory recall, thus there is no direct evidence that participants in the present study will have exhibited such biases.

Another demographic variable that was not measured during the experiments was the participants' levels of education. Furthermore, despite recruiting from both student and non-student samples, the present studies did not attempt to investigate the differences between these samples with regard to co-witness suggestibility. This was due to previous research suggesting that student and non-student eyewitnesses perform similarly on memory recall tasks (see Desmarais & Read, 2011, for review). However, future research should still seek to investigate whether such variables could have moderating effects on an eyewitness's susceptibility to co-witness influence.

11.5.9. Peripheral errors during the blame attribution task

The present studies attempted to observe the process of blame attribution through a task that required participants to identify which person from a CCTV footage had initiated the physical assault – a process that required the participants to report central details about the incident. Participants were not informed of either of the involved individuals' names and due to the angle of the CCTV camera, it would have been difficult for participants to clearly recognize and differentiate between each person's face. In lieu of this, participants identified

which person they thought was at blame by referring to the colour of the individual's clothing (yellow top or green top). However, the use of peripheral details from the event could have meant that if participants were unable to recall the correct colour of clothing each person had, they could have misattributed the wrong colour clothing to each person (i.e. thinking that the man in the yellow top was wearing a green top and/or the man in the green top was wearing a yellow top). Such errors could decrease the internal validity of the present studies' dependent variable, due to the chances of the responses being indicative of peripheral memory errors rather than blame attribution accuracy.

11.6. Conclusion

It is a common tendency for humans to discuss their memories of events with one-another and the more unusual and emotionally significant a memory is, the more the individual will want to discuss the event with another person (Gabbert, 2004). It is therefore no surprise that the majority of eyewitnesses seem to choose to discuss their witnessed incidents with others around them (Paterson & Kemp, 2006a). Within the past two decades, a wealth of research has attempted to observe the effects of co-witness discussions and the majority seem to have indicated that eyewitnesses can be influenced by the information they encounter during post-event discussions. Researchers have been able to demonstrate how misleading information from co-witnesses could influence an individual to falsely report seeing items that were not present, get the characteristics of certain details incorrect (e.g. suspect's hair colour), and even misidentify the wrong suspect from an identification parade. Rather than concerning one's self with false reports of inconsequential peripheral items that were not significantly relevant to a forensic investigation (such as the presence of certain items from a scene), the focus the present research was on observing the effects of co-witness influence on the false reporting of forensically relevant details, such as who they believed was to blame for committing the crime. The studies demonstrated that individuals could be influenced by their co-witnesses when attempting to attribute blame and, more importantly, it was observed that individuals could be influenced by their co-witnesses into blaming the wrong person for committing a crime. The empirical studies went further and built on the existing literature by identifying various internal and external factors that were proven to mediate co-witness influence. A key assertion made through the present findings was that the risks of co-witness influence are context-dependent, and will vary significantly depending on the characteristics of the targeted witness, the characteristics of the co-witnesses who are presenting the information, and the environmental characteristics of the incident. The present study successfully achieved its

main aims in investigating the effects of co-witness influence on eyewitness blame attribution and identifying the external and internal predictors of co-witness suggestibility, in relation to blame conformity and eyewitness confidence.

With regards to the practical implications of the findings, practitioners within the criminal justice system — both legal and investigative— could benefit from the discussed observations by enhancing their knowledge on not only the dangers of co-witness influence, but also the predictors of co-witness suggestibility. Of course, as discussed earlier (see 11.4.), there are boundaries to the applicability of the present study's findings to real criminal investigations. Moreover, the ecological validity of the laboratory-based observations are not completely exemplary, therefore, caution must still be taken when interpreting the findings and using them to assess the reliability of an eyewitness's statement. Practitioners can however, use the present findings to identify additional factors relating to both eyewitnesses and their environments that require consideration when evaluating the reliability of such investigative information. A key issue investigators are sometimes faced with is a surplus of investigative information — of which, most will be unreliable or inaccurate (Canter & Youngs, 2009). As a result, investigators have to be cautious in assessing the reliability of each source to prevent the investigations from following an incorrect lead and such a process could slow the investigation down severely. Therefore, by presenting investigators with more information for gauging the reliability of eyewitness evidence, the process of evaluating investigative information could be improved with regards to both accuracy and time efficiency. Furthermore, the findings may be able to help determine future interventions for preventing co-witness misinformation from guiding an investigation. It is proposed that future research will build on the present findings by investigating the most efficient approach for helping investigators filter out unwitnessed information from eyewitness reports.

References

- Adams, G., Ryan, J., Hoffman, J., Dobson, W., & Nielson, E. (1984). Ego identity status, conformity behavior, and personality in late adolescence. *Journal of Personality and Social Psychology*, 47(5), 1091-1104. <http://dx.doi.org/10.1037/0022-3514.47.5.1091>
- Adams-Price, C. (1992). Eyewitness memory and aging: Predictors of accuracy in recall and person recognition. *Psychology and Aging*, 7(4), 602-608. <http://dx.doi.org/10.1037/0882-7974.7.4.602>
- Adler, J. (2013). *Forensic psychology*. Hoboken: Taylor and Francis.
- Aebischer, V., Hewstone, M., & Henderson, M. (1984). Minority influence and musical preference: Innovation by conversion not coercion. *European Journal of Social Psychology*, 14(1), 23-33. <http://dx.doi.org/10.1002/ejsp.2420140103>
- Ainsworth, P. (2012). *Psychology Policing*. Hoboken: Taylor and Francis.
- Alicke, M., LoSchiavo, F., Zerbst, J., & Zhang, S. (1997). The person who out performs me is a genius: Maintaining perceived competence in upward social comparison. *Journal of Personality and Social Psychology*, 73(4), 781-789. <http://dx.doi.org/10.1037/0022-3514.73.4.781>
- Allan, K., & Gabbert, F. (2008). I still think it was a banana: Memorable 'lies' and forgettable 'truths'. *Acta Psychologica*, 127(2), 299-308. <http://dx.doi.org/10.1016/j.actpsy.2007.06.001>
- Allan, K., Midjord, J., Martin, D., & Gabbert, F. (2011). Memory conformity and the perceived accuracy of self versus other. *Memory & Cognition*, 40(2), 280-286. <http://dx.doi.org/10.3758/s13421-011-0141-9>
- Allen, V., & Levine, J. (1971). Social support and conformity: The effect of response order and differentiation from the group. *British Journal of Social and Clinical Psychology*, 10(2), 181-184. <http://dx.doi.org/10.1111/j.2044-8260.1971.tb00731.x>
- Allport, G. (1961) *Pattern and growth in personality*. New York: Holt, Rinehart & Winston.
- Allwood, C., Jonsson, A., & Granhag, P. (2005). The effects of source and type of feedback on child witnesses' metamemory accuracy. *Applied Cognitive Psychology*, 19(3), 331-344. <http://dx.doi.org/10.1002/acp.1071>

- Allwood, C., Knutsson, J., & Anders Granhag, P. (2006). Eyewitnesses under influence: How feedback affects the realism in confidence judgements. *Psychology, Crime & Law*, 12(1), 25-38. doi:10.1080/10683160512331316316
- Alvaro, E. & Crano, W. (1996). Cognitive responses to minority- or majority-based communications: Factors that underlie minority influence. *British Journal of Social Psychology*, 35(1), 105-121. <http://dx.doi.org/10.1111/j.2044-8309.1996.tb01086.x>
- Anderson, J. R. (2000). Learning and memory: An integrated approach. John Wiley & Sons Inc.
- Anderson, J., & Bower, G. (1972). A propositional theory of recognition memory. *Memory & Cognition*, 2(3), 406-412. <http://dx.doi.org/10.3758/bf03196896>
- Anderson, D., DePaulo, B., & Ansfield, M. (2002). The development of deception detection skill: A longitudinal study of same-sex friends. *Personality and Social Psychology Bulletin*, 28(4), 536-545. <http://dx.doi.org/10.1177/0146167202287010>
- Ando, J., Suzuki, A., Yamagata, S., Kijima, N., Maekawa, H., Ono, Y., & Jang, K. (2004). Genetic and environmental structure of Cloninger's temperament and character dimensions. *Journal of Personality Disorders*, 18(4), 379-393. <http://dx.doi.org/10.1521/pedi.2004.18.4.379>
- Areh, I. (2011). Gender-related differences in eyewitness testimony. *Personality and Individual Differences*, 50(5), 559-563. <http://dx.doi.org/10.1016/j.paid.2010.11.027>
- Asch, S. E. (1951). Effects of group pressure upon the modification and distortion of judgment. In H. Guetzkow (ed.) *Groups, leadership and men*. Pittsburgh, PA: Carnegie Press.
- Asch, S.E. (1952). *Social psychology*. Englewood Cliffs, NJ: Prentice Hall.
- Asch, S. (1955). Opinions and social pressure. *Scientific American*, 193(5), 31-35. doi:10.1038/scientificamerican1155-31
- Asch, S. (1956). Studies of independence and conformity: I. A minority of one against a unanimous majority. *Psychological Monographs: General and Applied*, 70(9), 1-70. <http://dx.doi.org/10.1037/h0093718>
- Astur, R., Ortiz, M., & Sutherland, R. (1998). A characterization of performance by men and women in a virtual Morris water task. *Behavioural Brain Research*, 93(1-2), 185-190. [http://dx.doi.org/10.1016/s0166-4328\(98\)00019-9](http://dx.doi.org/10.1016/s0166-4328(98)00019-9)
- Atelsek, F. & Schutz, W. (1959). Firo: A three-dimensional theory of interpersonal behavior. *The American Catholic Sociological Review*, 20(2), 148. <http://dx.doi.org/10.2307/3708975>

- Ayers, M., & Reder, L. (1998). A theoretical review of the misinformation effect: Predictions from an activation-based memory model. *Psychonomic Bulletin & Review*, 5(1), 1-21. <http://dx.doi.org/10.3758/bf03209454>
- Babbie, E. (2013). *The basics of social research* (1st ed., p. 187). Belmont, CA: Cengage Learning.
- Bäckman, L., & Nilsson, L. G. (1984). Aging effects in free recall: An exception to the rule. *Human Learning: Journal of Practical Research & Applications*.
- Bahrick, H. P. (1970). Two-phase model for prompted recall. *Psychological Review*, 77(3), 215.
- Baron, R., Vandello, J., & Brunsman, B. (1996). The forgotten variable in conformity research: Impact of task importance on social influence. *Journal of Personality and Social Psychology*, 71(5), 915-927. doi:10.1037//0022-3514.71.5.915
- Barry, H., Bacon, M., & Child, I. (1957). A cross-cultural survey of some sex differences in socialization. *The Journal of Abnormal and Social Psychology*, 55(3), 327-332. <http://dx.doi.org/10.1037/h0041178>
- Bartlett, F. (1933). Remembering: a study in experimental and social psychology. *British Journal of Educational Psychology*, 3(2), 187-192. <http://dx.doi.org/10.1111/j.2044-8279.1933.tb02913.x>
- Basden, D., & Basden, B. (1995). Some tests of the strategy disruption interpretation of part-list cuing inhibition. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 21(6), 1656-1669. <http://dx.doi.org/10.1037/0278-7393.21.6.1656>
- Basden, B., Basden, D., Bryner, S., & Thomas, R. (1997). A comparison of group and individual remembering: Does collaboration disrupt retrieval strategies? *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 23(5), 1176-1189. <http://dx.doi.org/10.1037/0278-7393.23.5.1176>
- Basden, B., Basden, D., Thomas, R., & Souphasith, S. (1997). Memory distortion in group recall. *Current Psychology*, 16(3-4), 225-246. <http://dx.doi.org/10.1007/s12144-997-1001-4>
- Bass, B. (1960). *Conformity, deviation, and a general theory of interpersonal behavior*. Washington, D.C.
- Baxter, J., Jackson, M., & Bain, S. (2003). Interrogative suggestibility: interactions between interviewees' self-esteem and interviewer style. *Personality and Individual Differences*, 35(6), 1285-1292. [http://dx.doi.org/10.1016/s0191-8869\(02\)00349-5](http://dx.doi.org/10.1016/s0191-8869(02)00349-5)

- Behrman, B. & Davey, S. (2001). Eyewitness identification in actual criminal cases: An archival analysis. *Law and Human Behavior, 25*(5), 475-491.
<http://dx.doi.org/10.1023/a:1012840831846>
- Bekerian, D., & Bowers, J. (1983). Eyewitness testimony: Were we misled? *Journal of Experimental Psychology: Learning, Memory, and Cognition, 9*(1), 139-145.
<http://dx.doi.org/10.1037//0278-7393.9.1.139>
- Belli, R. (1989). Influences of misleading postevent information: Misinformation interference and acceptance. *Journal of Experimental Psychology: General, 118*(1), 72-85.
<http://dx.doi.org/10.1037/0096-3445.118.1.72>
- Belli, R., Windschitl, P., McCarthy, T., & Winfrey, S. (1992). Detecting memory impairment with a modified test procedure: Manipulating retention interval with centrally presented event items. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 18*(2), 356-367. <http://dx.doi.org/10.1037/0278-7393.18.2.356>
- Berenda, R. (1950). *The influence of the group on the judgements of children*. New York: Columbia University Press.
- Berndt, T. (1992). Friendship and friends' influence in adolescence. *Current Directions In Psychological Science, 1*(5), 156-159. doi:10.1111/1467-8721.ep11510326
- Berns, G., Capra, C., Moore, S., & Noussair, C. (2010). Neural mechanisms of the influence of popularity on adolescent ratings of music. *Neuroimage, 49*(3), 2687-2696.
doi:10.1016/j.neuroimage.2009.10.070
- Betz, A., Skowronski, J., & Ostrom, T. (1996). Shared realities: Social influence and stimulus memory. *Social Cognition, 14*(2), 113-140. <http://dx.doi.org/10.1521/soco.1996.14.2.113>
- Biel, A., Von Borgstede, C., & Dahlstrand, U. (1999). Norm perception and cooperation in large scale social dilemmas. *Resolving Social Dilemmas: Dynamic, Structural, and Intergroup Aspects, 245*, 252.
- Bigelow, J. & Poremba, A. (2014). Achilles' ear? Inferior human short-term and recognition memory in the auditory modality. *Plos ONE, 9*(2),
<http://dx.doi.org/10.1371/journal.pone.0089914>
- Birditt, K. & Fingerma, K. (2003). Age and gender differences in adults' descriptions of emotional reactions to interpersonal problems. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 58*(4), 237-245. <http://dx.doi.org/10.1093/geronb/58.4.p237>

- Bishop, B. & Beckman, L. (1971). Developmental conformity. *Developmental Psychology*, 5(3), 536-536. <http://dx.doi.org/10.1037/h0031673>
- Blank, H. (2009). Remembering. *Social Psychology*, 40(3), 164-175.
<http://dx.doi.org/10.1027/1864-9335.40.3.164>
- Bless, H., Strack, F., & Walther, E. (2001). Memory as a target of social influence?: Memory distortions as a function of social influence and metacognitive knowledge. In J. P. Forgas, & K. D. Williams (Eds.) *Social influence: Direct and indirect processes* (pp. 167-189). Philadelphia: Psychology Press.
- Blumenthal, J. A. (2005). Does mood influence moral judgment-an empirical test with legal and policy implications? *Law & Psychology Review.*, 29, 1.
- Bond, C. & DePaulo, B. (2006). Accuracy of deception judgments. *Personality and Social Psychology Review*, 10(3), 214-234. http://dx.doi.org/10.1207/s15327957pspr1003_2
- Bond, R. (2005). Group size and conformity. *Group Processes & Intergroup Relations*, 8(4), 331-354. doi:10.1177/1368430205056464
- Bothwell, R.K., Brigham, J.C. and Pigott, M.A., 1987. An exploratory study of personality differences in eyewitness memory. *Journal of Social Behavior and Personality*, 2(3), pp. 335-343.
- Brewer, N. & Burke, A. (2002). Effects of testimonial inconsistencies and eyewitness confidence on mock-juror judgments. *Law and Human Behavior*, 26(3), 353-364.
<http://dx.doi.org/10.1023/a:1015380522722>
- Brewer, N., Keast, A., & Rishworth, A. (2002). The confidence-accuracy relationship in eyewitness identification: The effects of reflection and disconfirmation on correlation and calibration. *Journal of Experimental Psychology: Applied*, 8(1), 44-56.
<http://dx.doi.org/10.1037/1076-898x.8.1.44>
- Brigham, J. & Malpass, R. (1985). The role of experience and contact in the recognition of faces of own- and other-race persons. *Journal of Social Issues*, 41(3), 139-155.
<http://dx.doi.org/10.1111/j.1540-4560.1985.tb01133.x>
- Brigham, J. & WolfsKeil, M. (1983). Opinions of attorneys and law enforcement personnel on the accuracy of eyewitness identifications. *Law and Human Behavior*, 7(4), 337-349.
<http://dx.doi.org/10.1007/bf01044736>
- British Psychological Society. (2007). Modernising police powers: Review of the Police and Criminal Evidence (PACE) Act1984, *submission to the Home Office consultation*.

- Broverman, I., Vogel, S., Broverman, D., Clarkson, F., & Rosenkrantz, P. (1972). Sex-role stereotypes: A current appraisal. *Journal of Social Issues, 28*(2), 59-78.
<http://dx.doi.org/10.1111/j.1540-4560.1972.tb00018.x>
- Brown, R., & McNeill, D. (1966). The "tip of the tongue" phenomenon. *Journal of Verbal Learning and Verbal Behavior, 5*(4), 325-337. [http://dx.doi.org/10.1016/s0022-5371\(66\)80040-3](http://dx.doi.org/10.1016/s0022-5371(66)80040-3)
- Bruni, E. (1963) *A film test of accuracy in observing people and its correlates*. Unpublished Master's thesis, Michigan State University.
- Buchanan, T., & Lovallo, W. (2001). Enhanced memory for emotional material following stress-level cortisol treatment in humans. *Psychoneuroendocrinology, 26*(3), 307-317.
[http://dx.doi.org/10.1016/s0306-4530\(00\)00058-5](http://dx.doi.org/10.1016/s0306-4530(00)00058-5)
- Burger, J., Soroka, S., Gonzago, K., Murphy, E., & Somervell, E. (2001). The effect of fleeting attraction on compliance to requests. *Personality and Social Psychology Bulletin, 27*(12), 1578-1586. <http://dx.doi.org/10.1177/01461672012712002>
- Bushman, B. (1984). Perceived symbols of authority and their influence on compliance. *Journal of Applied Social Psychology, 14*(6), 501-508. <http://dx.doi.org/10.1111/j.1559-1816.1984.tb02255.x>
- Butts, S., Mixon, K., Mulekar, M., & Bringmann, W. (1995). Gender differences in eyewitness testimony. *Perceptual and Motor Skills, 80*(1), 59-63.
<http://dx.doi.org/10.2466/pms.1995.80.1.59>
- Campbell-Kibler, K. (2009). The nature of sociolinguistic perception. *Language Variation and Change, 21*(01), 135-156. <http://dx.doi.org/10.1017/s0954394509000052>
- Campbell, J., & Fairey, P. (1989). Informational and normative routes to conformity: The effect of faction size as a function of norm extremity and attention to the stimulus. *Journal of Personality and Social Psychology, 57*(3), 457-468. doi:10.1037//0022-3514.57.3.457
- Candel, I., Merckelbach, H., Jelicic, M., Limpens, M., & Widdershoven, K. (2004). Children's suggestibility for peripheral and central details. *Journal of Credibility Assessment and Witness Psychology, 5*(1), 9-18.
- Cann, D. & Katz, A. (2005). Habitual acceptance of misinformation: Examination of individual differences and source attributions. *Memory & Cognition, 33*(3), 405-417.
<http://dx.doi.org/10.3758/bf03193059>
- Canter, D. V., & Youngs, D. (2009). *Investigative psychology: Offender profiling and the analysis of criminal action*. John Wiley & Sons.

- Cardozo, B. N. (2009) Reevaluating lineups: Why witnesses make mistakes and how to reduce the chance of a misidentification. New York: Innocence Project, Inc .
- Carlucci, M., Kieckhafer, J., Schwartz, S., Villalba, D., & Wright, D. (2010). The south beach study: Bystanders' memories are more malleable. *Applied Cognitive Psychology, 25*(4), 562-566. <http://dx.doi.org/10.1002/acp.1720>
- Caruso, D., Mayer, J., & Salovey, P. (2002). Relation of an ability measure of emotional intelligence to personality. *Journal of Personality Assessment, 79*(2), 306-320. http://dx.doi.org/10.1207/s15327752jpa7902_12
- Carver, C. & Garza, N. (1984). Schema-guided information search in stereotyping of the elderly. *Journal of Applied Social Psychology, 14*(1), 69-81. <http://dx.doi.org/10.1111/j.1559-1816.1984.tb02221.x>
- Carver, C., & Scheier, M. (1981). The self-attention-induced feedback loop and social facilitation. *Journal of Experimental Social Psychology, 17*(6), 545-568. doi:10.1016/0022-1031(81)90039-1
- Cavazza, N. & Mucchi-Faina, A. (2008). Me, us, or them: Who is more conformist? Perception of conformity and political orientation. *The Journal of Social Psychology, 148*(3), 335-346. <http://dx.doi.org/10.3200/socp.148.3.335-346>
- Cervone, D. & Pervin, L. (2014). *Personality psychology*. Singapore: Wiley.
- Chae, Y. (2010). Application of laboratory research on eyewitness testimony. *Journal of Forensic Psychology Practice, 10*(3), 252-261. <http://dx.doi.org/10.1080/15228930903550608>
- Chandler, C. (1991). How memory for an event is influenced by related events: Interference in modified recognition tests. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 17*(1), 115-125. <http://dx.doi.org/10.1037/0278-7393.17.1.115>
- Chapman, A., Mayer, J., Specht, M., Farmer, R., & Field, C. (2003). Passive avoidance learning as a function of Cloninger's temperament typology: an extension to male undergraduates. *Personality and Individual Differences, 35*(7), 1571-1584. [http://dx.doi.org/10.1016/s0191-8869\(02\)00371-9](http://dx.doi.org/10.1016/s0191-8869(02)00371-9)
- Charness, G. & Rustichini, A. (2011). Gender differences in cooperation with group membership. *Games and Economic Behavior, 72*(1), 77-85. <http://dx.doi.org/10.1016/j.geb.2010.07.006>

- Christiaansen, R., Ochalek, K., & Sweeney, J. (1984). Individual differences in eyewitness memory and confidence judgments. *The Journal of General Psychology*, *110*(1), 47-52.
<http://dx.doi.org/10.1080/00221309.1984.9709946>
- Christianson, S. (1992). Emotional stress and eyewitness memory: A critical review. *Psychological Bulletin*, *112* (2) 284-309. Doi: 10.1037/0033-2909.112.2.284.
- Cialdini, R. B. (2001). Harnessing the science of persuasion. *Harvard Business Review*, *79*(9), 72-81.
- Cialdini, R. & Goldstein, N. (2004). Social influence: Compliance and conformity. *Annual Review of Psychology*, *55*(1), 591-621. <http://dx.doi.org/10.1146/annurev.psych.55.090902.142015>
- Cialdini, R., & Trost, M. (1998). Social influence: Social norms, conformity and compliance. New York: *Mcgraw-Hill*.
- Claes, M., & Poirier, L. (1992). Characteristics and functions of friendship in adolescence. *La Psychiatrie de l'enfant*, *36*(1), 289-308.
- Clark, N., Stephenson, G., & Kniveton, B. (1990). Social remembering: Quantitative aspects individual and collaborative remembering police officers and students. *British Journal of Psychology*, *81*(1), 73-94. <http://dx.doi.org/10.1111/j.2044-8295.1990.tb02347.x>
- Clifford, B. & Scott, J. (1978). Individual and situational factors in eyewitness testimony. *Journal of Applied Psychology*, *63*(3), 352-359. <http://dx.doi.org/10.1037/0021-9010.63.3.352>
- Cloninger, C. (1999). *Personality and psychopathology*. Washington, DC: American Psychiatric Press.
- Cloninger, C., Bayon, C., & Svrakic, D. (1998). Measurement of temperament and character in mood disorders: a model of fundamental states as personality types. *Journal of Affective Disorders*, *51*(1), 21-32. [http://dx.doi.org/10.1016/s0165-0327\(98\)00153-0](http://dx.doi.org/10.1016/s0165-0327(98)00153-0)
- Cloninger, C. R., & Svrakic, D. M. (1992). Personality dimensions as a conceptual framework for explaining variations in normal, neurotic, and personality disordered behavior. In G. D. Burrows, M. Roth, & R. Noyes Jr. (Eds.), *Handbook of anxiety* (Vol. 5, pp. 79 –104). New York: Elsevier.
- Cohen, G. & Faulkner, D. (1989). Age differences in source forgetting: Effects on reality monitoring and on eyewitness testimony. *Psychology and Aging*, *4*(1), 10-17.
<http://dx.doi.org/10.1037/0882-7974.4.1.10>
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum.

- Cohen, R., Bornstein, R., & Sherman, R. (1973). Conformity behavior of children as a function of group makeup and task ambiguity. *Developmental Psychology*, 9(1), 124-131.
<http://dx.doi.org/10.1037/h0035082>
- Comings, D., Gonzales, N., Saucier, G., Johnson, P., & MacMurray, J. (2000). The DRD4 gene and the spiritual transcendence scale of the character temperament index. *Psychiatric Genetics*, 10(4), 185-189. <http://dx.doi.org/10.1097/00041444-200010040-00006>
- Corr, P., Pickering, A., & Gray, J. (1995). Personality and reinforcement in associative and instrumental learning. *Personality and Individual Differences*, 19(1), 47-71.
[http://dx.doi.org/10.1016/0191-8869\(95\)00013-v](http://dx.doi.org/10.1016/0191-8869(95)00013-v)
- Corson, Y., Verrier, N., & Bucic, A. (2009). False memories and individual variations: The role of field dependence–independence. *Personality and Individual Differences*, 47(1), 8-11.
<http://dx.doi.org/10.1016/j.paid.2009.01.036>
- Costa, P. & McCrae, R. (1992). Revised NEO personality inventory (NEO PI-R) and NEP five-factor inventory (NEO-FFI). Odessa, Fla.: Psychological Assessment Resources.
- Coupe, T. & Griffiths, M. (1996). *Solving residential burglary*. London: Home Office Police Research Group.
- Coxon, P. & Valentine, T. (1997). The effects of the age of eyewitnesses on the accuracy and suggestibility of their testimony. *Applied Cognitive Psychology*, 11(5), 415-430.
[http://dx.doi.org/10.1002/\(sici\)1099-0720\(199710\)11:5<415::aid-acp469>3.3.co;2-1](http://dx.doi.org/10.1002/(sici)1099-0720(199710)11:5<415::aid-acp469>3.3.co;2-1)
- Craik, F. & Lockhart, R. (1972). Levels of processing: A framework for memory research. *Journal of Verbal Learning and Verbal Behavior*, 11(6), 671-684. [http://dx.doi.org/10.1016/s0022-5371\(72\)80001-x](http://dx.doi.org/10.1016/s0022-5371(72)80001-x)
- Crano, W. D. (2001). Social influence, social identity, and ingroup leniency. *Group Consensus and Minority Influence: Implications for Innovation*, 122-143. Oxford: Blackwell.
- Crawford, J. & Stankov, L. (1996). Age differences in the realism of confidence judgements: A calibration study using tests of fluid and crystallized intelligence. *Learning and Individual Differences*, 8(2), 83-103. [http://dx.doi.org/10.1016/s1041-6080\(96\)90027-8](http://dx.doi.org/10.1016/s1041-6080(96)90027-8)
- Crutchfield, R. (1955). Conformity and character. *American Psychologist*, 10(5), 191-198.
<http://dx.doi.org/10.1037/h0040237>
- Cutler, B. (2006). Sample of witness, crime, and perpetrator characteristics affecting eyewitness identification accuracy. *Cardozo Public Law, Policy & Ethics Journal*, 4, 327.

- Cutler, B., Penrod, S., & Stuve, T. (1988). Juror decision making in eyewitness identification cases. *Law and Human Behavior, 12*(1), 41-55. <http://dx.doi.org/10.1007/bf01064273>
- Dahlström, Ö., Danielsson, H., Emilsson, M., & Andersson, J. (2011). Does retrieval strategy disruption cause general and specific collaborative inhibition?. *Memory, 19*(2), 140-154. <http://dx.doi.org/10.1080/09658211.2010.539571>
- Dalton, A., & Daneman, M. (2006). Social suggestibility to central and peripheral misinformation. *Memory, 14*(4), 486-501. doi: 10.1080/09658210500495073
- Dando, C., Wilcock, R., Milne, R., & Henry, L. (2009). A modified cognitive interview procedure for frontline police investigators. *Applied Cognitive Psychology, 23*(5), 698-716. <http://dx.doi.org/10.1002/acp.1501>
- Daneman, M., Thannikkotu, C., & Chen, Z. (2013). Are There Age-Related Differences in Social Suggestibility to Central and Peripheral Misinformation?. *Experimental Aging Research, 39*(3), 342-369. doi: 10.1080/0361073x.2013.779201
- Darley, J., & Latane, B. (1968). Bystander intervention in emergencies: Diffusion of responsibility. *Journal of Personality and Social Psychology, 8*(4), 377-383. doi:10.1037/h0025589
- Davies, G. & Robertson, N. (1993). Recognition memory for automobiles: A developmental study. *Bulletin of The Psychonomic Society, 31*(2), 103-106. <http://dx.doi.org/10.3758/bf03334152>
- Davies, G. M. (1996). Children's identification evidence. In S. L. Sporer & R. S. Malpass, *Psychological issues in eyewitness identification* (233-258). Mahwah, NJ: Lawrence Erlbaum Associates Inc.
- Davies, G., Ellis, H., & Shepherd, J. (1981). *Perceiving and remembering faces*. London: Academic Press.
- Davis, J. & Frank, B. (1979). Learning and memory of field independent-dependent individuals. *Journal of Research In Personality, 13*(4), 469-479. [http://dx.doi.org/10.1016/0092-6566\(79\)90009-6](http://dx.doi.org/10.1016/0092-6566(79)90009-6)
- Davis, S. & Meade, M. (2013). Both young and older adults discount suggestions from older adults on a social memory test. *Psychonomic Bulletin & Review, 20*(4), 760-765. <http://dx.doi.org/10.3758/s13423-013-0392-5>
- Deffenbacher, K., Bornstein, B., Penrod, S., & McGorty, E. (2004). A meta-analytic review of the effects of high stress on eyewitness memory. *Law and Human Behavior, 28*(6), 687-706. <http://dx.doi.org/10.1007/s10979-004-0565-x>

- Dent, H. & Flin, R. (1992). *Children as witnesses* (1st ed.). Chichester: Wiley.
- Dershowitz, A. (1996). *Reasonable doubts*. New York: Simon & Schuster.
- Deutsch, D. & Deutsch, J. (1975). *Short-term memory*. New York: Academic Press.
- Deutsch, M., & Gerard, H. B. (1955). A study of normative and informative social influences upon individual judgment. *Journal of Abnormal Social Psychology*, 51 (6), 29-36. doi: 10.1037/h0046408
- Devine, D. (2012). *Jury decision making* (1st ed.). New York: New York University Press.
- Devine, D., Clayton, L., Dunford, B., Seying, R., & Pryce, J. (2001). Jury decision making: 45 years of empirical research on deliberating groups. *Psychology, Public Policy, and Law*, 7(3), 622-727. <http://dx.doi.org/10.1037/1076-8971.7.3.622>
- Devine, P. (1989). Stereotypes and prejudice: Their automatic and controlled components. *Journal of Personality and Social Psychology*, 56(1), 5-18. <http://dx.doi.org/10.1037/0022-3514.56.1.5>
- Dewhurst, S. (2001). Category repetition and false recognition: Effects of instance frequency and category size. *Journal of Memory and Language*, 44(1), 153-167. <http://dx.doi.org/10.1006/jmla.2000.2738>
- Di Vesta, F. (1959). Effects of confidence and motivation on susceptibility to informational social influence. *The Journal of Abnormal and Social Psychology*, 59(2), 204-209. <http://dx.doi.org/10.1037/h0042945>
- Dodd, D. & Bradshaw, J. (1980). Leading questions and memory: Pragmatic constraints. *Journal of Verbal Learning and Verbal Behavior*, 19(6), 695-704. [http://dx.doi.org/10.1016/s0022-5371\(80\)90379-5](http://dx.doi.org/10.1016/s0022-5371(80)90379-5)
- Dodson, C. & Krueger, L. (2006). I misremember it well: Why older adults are unreliable eyewitnesses. *Psychonomic Bulletin & Review*, 13(5), 770-775. <http://dx.doi.org/10.3758/bf03193995>
- Dodson, C., Bawa, S., & Slotnick, S. (2007). Aging, source memory, and misrecollections. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 33(1), 169-181. <http://dx.doi.org/10.1037/0278-7393.33.1.169>
- Doughty, N., Paterson, H., MacCann, C., & Monds, L. (2017). Personality and memory conformity. *Journal of Individual Differences*, 38(1), 12-20. <http://dx.doi.org/10.1027/1614-0001/a000217>
- Draaisma, D. (2012). *Why life speeds up as you get older*. Cambridge: Cambridge University Press.

- Dwyer, J., Scheck, B., & Neufeld, P. (2000). *Actual innocence* (1st ed., p. 56). New York: Signet.
- Dysart, J., Lindsay, R., MacDonald, T., & Wicke, C. (2002). The intoxicated witness: Effects of alcohol on identification accuracy from showups. *Journal of Applied Psychology, 87*(1), 170-175. <http://dx.doi.org/10.1037/0021-9010.87.1.170>
- Eagly, A. (1978). Sex differences in influenceability. *Psychological Bulletin, 85*(1), 86. doi: 10.1037/0033-2909.85.1.86.
- Eagly, A. (1983). Gender and social influence: A social psychological analysis. *American Psychologist, 38*(9), 971-981. doi: 10.1037/0003-066X.38.9.971.
- Eagly, A., & Carli, L. (1981). Sex of researchers and sex-typed communications as determinants of sex differences in influenceability: a meta-analysis of social influence studies. *Psychological Bulletin, 90*(1), 1. doi: 10.1037/0033-2909.90.1.1.
- Eagly, A., & Chrvala, C. (1986). Sex differences in conformity: Status and gender role interpretations. *Psychology of Women Quarterly, 10*(3), 203-220. doi:10.1111/j.1471-6402.1986.tb00747
- Eagly, A., Wood, W., & Fishbaugh, L. (1981). Sex differences in conformity: Surveillance by the group as a determinant of male nonconformity. *Journal of Personality and Social Psychology, 40*(2), 384. doi: 10.1037/0022-3514.40.2.384.
- Eberle, P., & Eberle, S. (2003). *The abuse of innocence*. Buffalo, N.Y.: Prometheus Books.
- Echterhoff, G., Higgins, E., & Groll, S. (2005). Audience-tuning effects on memory: The role of shared reality. *Journal of Personality and Social Psychology, 89*(3), 257-276. <http://dx.doi.org/10.1037/0022-3514.89.3.257>
- Echterhoff, G., Hirst, W., & Hussy, W. (2005). How eyewitnesses resist misinformation: Social postwarnings and the monitoring of memory characteristics. *Memory & Cognition, 33*(5), 770-782. <http://dx.doi.org/10.3758/bf03193073>
- Eck, M., Thoftne, A., Sponsor, F., & Vanvoorhis, B. A. (2008). Memory conformity and eyewitness testimony. *Journal of Undergraduate Research, XI*, 1-4.
- Eisen, M. & Lynn, S. (2001). Dissociation, memory and suggestibility in adults and children. *Applied Cognitive Psychology, 15*(7), S49-S73. <http://dx.doi.org/10.1002/acp.834>
- Engler, B. (2009). *Personality theories*. Belmont, Calif.: Wadsworth Cengage Learning.
- Epley, N. & Gilovich, T. (1999). Just going along: Nonconscious priming and conformity to social pressure. *Journal of Experimental Social Psychology, 35*(6), 578-589. <http://dx.doi.org/10.1006/jesp.1999.1390>

- Evans, J. & Schreiber Compo, N. (2010). Mock jurors' perceptions of identifications made by intoxicated eyewitnesses. *Psychology, Crime & Law*, 16(3), 191-210.
<http://dx.doi.org/10.1080/10683160802612890>
- Exner, J. (1973). The Self Focus Sentence Completion: A Study of Egocentricity. *Journal of Personality Assessment*, 37(5), 437-455. doi:10.1080/00223891.1973.10119902
- Eysenck, H. & Eysenck, S. (1975). Manual of the Eysenck personality questionnaire (junior and adult). London: Hodder and Stoughton.
- Eysenck, M. (2012). Attention and arousal: Cognition and performance. New York: Springer.
- Farmer, R. & Goldberg, L. (2008). A psychometric evaluation of the revised Temperament and Character Inventory (TCI-R) and the TCI-140. *Psychological Assessment*, 20(3), 281-291.
<http://dx.doi.org/10.1037/a0012934>
- Farmer, R., Field, C., Gremore, T., Chapman, A., Nash, H., & Mayer, J. (2003). Passive avoidance learning among females as a function of Cloninger's temperament typology. *Personality and Individual Differences*, 34(6), 983-997. [http://dx.doi.org/10.1016/s0191-8869\(02\)00083-1](http://dx.doi.org/10.1016/s0191-8869(02)00083-1)
- Feldman-Summers, S. & Lindner, K. (1976). Perceptions of victims and defendants in criminal assault cases. *Criminal Justice and Behavior*, 3(2), 135-150.
<http://dx.doi.org/10.1177/009385487600300203>
- Fenigstein, A. (1979). Self-consciousness, self-attention, and social interaction. *Journal of Personality and Social Psychology*, 37(1), 75-86. doi:10.1037//0022-3514.37.1.75
- Ferguson, C., Cruz, A., & Rueda, S. (2007). Gender, video game playing habits and visual memory tasks. *Sex Roles*, 58(3-4), 279-286. <http://dx.doi.org/10.1007/s11199-007-9332-z>
- Ferguson, S., Hashtroudi, S., & Johnson, M. (1992). Age differences in using source-relevant cues. *Psychology and Aging*, 7(3), 443-452. <http://dx.doi.org/10.1037/0882-7974.7.3.443>
- Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, 7(2), 117-140.
<http://dx.doi.org/10.1177/001872675400700202>
- Fiedler, K. (2000). Beware of samples! A cognitive-ecological sampling approach to judgment biases. *Psychological Review*, 107(4), 659-676. <http://dx.doi.org/10.1037/0033-295x.107.4.659>
- Fisher, R. P., Geiselman, R. E., Raymond, D. S., Jurkevich, L. M., & Warhaftig, M. L. (1987). Enhancing enhanced eyewitness memory: Refining the cognitive interview. *Journal of Police Science and Administration*, 15(4), 285-290.
- Forbes, J. R. (2003). The Laws of Australia. *Testimony*, 16.4, 66.

- Forgas, J. & Williams, K. (2001). *Social influence* (1st ed.). Philadelphia: Psychology Press.
- Forgas, J., & Von Hippel, W. (2005). *The social outcast* (1st ed.). CRC Press.
- Foster, J., Huthwaite, T., Yesberg, J., Garry, M., & Loftus, E. (2012). Repetition, not number of sources, increases both susceptibility to misinformation and confidence in the accuracy of eyewitnesses. *Acta Psychologica*, 139(2), 320-326.
<http://dx.doi.org/10.1016/j.actpsy.2011.12.004>
- Fouad, N., Grus, C., Hatcher, R., Kaslow, N., Hutchings, P., & Madson, M. (2009). Competency benchmarks: A model for understanding and measuring competence in professional psychology across training levels. *Training and Education In Professional Psychology*, 3(4, Suppl), S5-S26. <http://dx.doi.org/10.1037/a0015832>
- Freeman, L. (1978). Centrality in social networks conceptual clarification. *Social Networks*, 1(3), 215-239. doi:10.1016/0378-8733(78)90021-7
- French, L., Garry, M., & Mori, K. (2008). You say tomato? Collaborative remembering leads to more false memories for intimate couples than for strangers. *Memory*, 16(3), 262-273.
<http://dx.doi.org/10.1080/09658210701801491>
- French, L., Garry, M., & Mori, K. (2011). Relative – not absolute – judgments of credibility affect susceptibility to misinformation conveyed during discussion. *Acta Psychologica*, 136(1), 119-128. <http://dx.doi.org/10.1016/j.actpsy.2010.10.009>
- French, L., Sutherland, R., & Garry, M. (2006). Discussion affects memory for true and false childhood events. *Applied Cognitive Psychology*, 20(5), 671-680.
<http://dx.doi.org/10.1002/acp.1219>
- Frenda, S., Nichols, R., & Loftus, E. (2011). Current Issues and advances in misinformation research. *Current Directions In Psychological Science*, 20(1), 20-23.
<http://dx.doi.org/10.1177/0963721410396620>
- Frenzen, J. & Davis, H. (1990). Purchasing behavior in embedded markets. *Journal of Consumer Research*, 17(1), 1. <http://dx.doi.org/10.1086/208532>
- Friedman, W. (1993). Memory for the time of past events. *Psychological Bulletin*, 113(1), 44-66.
<http://dx.doi.org/10.1037/0033-2909.113.1.44>
- Furnham, A. (1986). Response bias, social desirability and dissimulation. *Personality and Individual Differences*, 7(3), 385-400. [http://dx.doi.org/10.1016/0191-8869\(86\)90014-0](http://dx.doi.org/10.1016/0191-8869(86)90014-0)

- Furnham, A. (1990). The fakeability of the 16 PF, Myers-Briggs and FIRO-B personality measures. *Personality and Individual Differences, 11*(7), 711-716.
[http://dx.doi.org/10.1016/0191-8869\(90\)90256-q](http://dx.doi.org/10.1016/0191-8869(90)90256-q)
- Gabbert, F. (2004). Memory conformity between co-witnesses: the effects of discussion on subsequent memory accuracy, PhD, University of Aberdeen, Aberdeen.
- Gabbert, F., Brewer, N., & Hope, L. (2007). Effects of co-witness confidence on identification decisions. In *Seventh Biennial Conference of the Society for Applied Research in Memory and Cognition, Lewiston*.
- Gabbert, F., Hope, L., Fisher, R., & Jamieson, K. (2012). Protecting against misleading post-event information with a self-administered interview. *Applied Cognitive Psychology, 26*(4), 568-575. <http://dx.doi.org/10.1002/acp.2828>
- Gabbert, F., Memon, A., & Allan, K. (2003). Memory conformity: can eyewitnesses influence each other's memories for an event?. *Applied Cognitive Psychology, 17*(5), 533-543.
<http://dx.doi.org/10.1002/acp.885>
- Gabbert, F., Memon, A., & Wright, D. (2006). Memory conformity: Disentangling the steps toward influence during a discussion. *Psychonomic Bulletin & Review, 13*(3), 480-485.
<http://dx.doi.org/10.3758/bf03193873>
- Gabbert, F., Memon, A., & Wright, D. (2007). I saw it for longer than you: The relationship between perceived encoding duration and memory conformity. *Acta Psychologica, 124*(3), 319-331. <http://dx.doi.org/10.1016/j.actpsy.2006.03.009>
- Gabbert, F., Memon, A., Allan, K., & Wright, D. (2004). Say it to my face: Examining the effects of socially encountered misinformation. *Legal and Criminological Psychology, 9*(2), 215-227.
<http://dx.doi.org/10.1348/1355325041719428>
- Gana, K. & Trouillet, R. (2003). Structure invariance of the Temperament and Character Inventory (TCI). *Personality and Individual Differences, 35*(7), 1483-1495.
[http://dx.doi.org/10.1016/s0191-8869\(02\)00364-1](http://dx.doi.org/10.1016/s0191-8869(02)00364-1)
- Garland, R. (1991). The mid-point on a rating scale: Is it desirable?. *Marketing Bulletin, 2*, 66-70.
- Garrett, B. (2011). *Convicting the innocent*. Cambridge, Mass.: Harvard University Press.
- Garrido, E., Masip, J., & Herrero, C. (2004). Police officers' credibility judgments: Accuracy and estimated ability. *International Journal of Psychology, 39*(4), 254-275.
<http://dx.doi.org/10.1080/00207590344000411>

- Garry, M., French, L., Kinzett, T., & Mori, K. (2008). Eyewitness memory following discussion: using the MORI technique with a Western sample. *Applied Cognitive Psychology, 22*(4), 431-439. <http://dx.doi.org/10.1002/acp.1376>
- Gerard, H., Wilhelmy, R., & Conolley, E. (1968). Conformity and group size. *Journal of Personality and Social Psychology, 8*(1), 79-82. <http://dx.doi.org/10.1037/h0025325>
- Gerrie, M. P., Garry, M., & Loftus, E. F. (2005). False memories. *Psychology and law: An empirical perspective, 1*, 222-253.
- Gilbert, P. & Allan, S. (1994). Assertiveness, submissive behaviour and social comparison. *British Journal of Clinical Psychology, 33*(3), 295-306. <http://dx.doi.org/10.1111/j.2044-8260.1994.tb01125.x>
- Gilbert, P. (1993). Defence and safety: Their function in social behaviour and psychopathology. *British Journal of Clinical Psychology, 32*(2), 131-153. <http://dx.doi.org/10.1111/j.2044-8260.1993.tb01039.x>
- Glisky, E., Rubin, S., & Davidson, P. (2001). Source memory in older adults: An encoding or retrieval problem?. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 27*(5), 1131-1146. <http://dx.doi.org/10.1037/0278-7393.27.5.1131>
- Glomb, T., & Liao, H. (2003). Interpersonal aggression in work groups: social influence, reciprocal, and individual effects. *Academy of Management Journal, 46*(4), 486-496. <http://dx.doi.org/10.2307/30040640>
- Gluck, G. (1979). The Kramer-Froehle Controversy: A contribution to construct validity of the FIRO-B questionnaire. *Journal of Personality Assessment, 43*(5), 541-543. http://dx.doi.org/10.1207/s15327752jpa4305_19
- Gluck, G. A. (1983). Psychometric properties of the FIRO-B: A guide to research, Palo Alto, California: *Consulting Psychologists Press, Inc.*
- Goldberg, S. (1954). Three situational determinants of conformity to social norms. *The Journal of Abnormal and Social Psychology, 49*(3), 325-329. <http://dx.doi.org/10.1037/h0056249>
- Goldsmith, M., Koriat, A., & Pansky, A. (2005). Strategic regulation of grain size in memory reporting over time. *Journal of Memory and Language, 52*(4), 505-525. <http://dx.doi.org/10.1016/j.jml.2005.01.010>
- Goldstein, A., Johnson, K., & Chance, J. (1979). Does fluency of face description imply superior face recognition?. *Bulletin of the Psychonomic Society, 13*(1), 15-18. <http://dx.doi.org/10.3758/bf03334999>

- Goodwin, K., Kukucka, J., & Hawks, I. (2012). Co-witness confidence, conformity, and eyewitness memory: An examination of normative and informational social influences. *Applied Cognitive Psychology, 27*(1), 91-100. <http://dx.doi.org/10.1002/acp.2877>
- Gosling, S., Rentfrow, P., & Swann, W. (2003). A very brief measure of the Big-Five personality domains. *Journal of Research In Personality, 37*(6), 504-528. [http://dx.doi.org/10.1016/s0092-6566\(03\)00046-1](http://dx.doi.org/10.1016/s0092-6566(03)00046-1)
- Granhag, P., Strömwall, L., & Hartwig, M. (2005). Eyewitness testimony: tracing the beliefs of Swedish legal professionals. *Behavioral Sciences & The Law, 23*(5), 709-727. <http://dx.doi.org/10.1002/bsl.670>
- Greene, E., Flynn, M., & Loftus, E. (1982). Inducing resistance to misleading information. *Journal of Verbal Learning and Verbal Behavior, 21*(2), 207-219. [http://dx.doi.org/10.1016/s0022-5371\(82\)90571-0](http://dx.doi.org/10.1016/s0022-5371(82)90571-0)
- Gudjonsson, G. (1983). Suggestibility, intelligence, memory recall and personality: an experimental study. *The British Journal of Psychiatry, 142*(1), 35-37. <http://dx.doi.org/10.1192/bjp.142.1.35>
- Gudjonsson, G. (1984). A new scale of interrogative suggestibility. *Personality and Individual Differences, 5*(3), 303-314. [http://dx.doi.org/10.1016/0191-8869\(84\)90069-2](http://dx.doi.org/10.1016/0191-8869(84)90069-2)
- Gudjonsson, G. (1988). Interrogative suggestibility: Its relationship with assertiveness, social-evaluative anxiety, state anxiety and method of coping. *British Journal of Clinical Psychology, 27*(2), 159-166. <http://dx.doi.org/10.1111/j.2044-8260.1988.tb00764.x>
- Gudjonsson, G. (2003). *The psychology of interrogations and confessions*. Chichester, West Sussex, England: Wiley.
- Gudjonsson, G., Sigurdsson, J., Bragason, O., Einarsson, E., & Valdimarsdottir, E. (2004). Confessions and denials and the relationship with personality. *Legal and Criminological Psychology, 9*(1), 121-133. <http://dx.doi.org/10.1348/135532504322776898>
- Hagger, M., & Chatzisarantis, N. (2005). First- and higher-order models of attitudes, normative influence, and perceived behavioural control in the theory of planned behaviour. *British Journal of Social Psychology, 44*(4), 513-535. doi:10.1348/014466604x16219
- Hain, P. (1976). *Mistaken identity*. London: Quartet Books.
- Hampikian, G., West, E., & Akselrod, O. (2011). 'The genetics of innocence: analysis of 194 U.S. DNA exonerations'. *Annual Review of Genomics and Human Genetics, 12*, pp. 97-120. DOI: 10.1146/annurev-genom-082509-141715

- Hanba, J., & Zaragoza, M. (2007). Interviewer feedback in repeated interviews involving forced confabulation. *Applied Cognitive Psychology, 21*(4), 433-455.
<http://dx.doi.org/10.1002/acp.1286>
- Hansenne, M., Pitchot, W., Pinto, E., Reggers, J., Papart, P., & Ansseau, M. (2000). P300 event-related brain potential and personality in depression. *European Psychiatry, 15*(6), 370-377.
[http://dx.doi.org/10.1016/s0924-9338\(00\)00505-8](http://dx.doi.org/10.1016/s0924-9338(00)00505-8)
- Hansson, P., Rönnlund, M., Juslin, P., & Nilsson, L. (2008). Adult age differences in the realism of confidence judgments: Overconfidence, format dependence, and cognitive predictors. *Psychology and Aging, 23*(3), 531-544. <http://dx.doi.org/10.1037/a0012782>
- Hardy, K. (1957). Determinants of conformity and attitude change. *The Journal of Abnormal and Social Psychology, 54*(3), 289-294. <http://dx.doi.org/10.1037/h0048374>
- Harper, R. G. (1985). Power, dominance, and nonverbal behavior: An overview. In Ellyson, S., & Dovidio, J. F. (1985) *Power, dominance, and nonverbal behavior* (pp. 29-48). Springer New York.
- Harris, C., Paterson, H., & Kemp, R. (2008). Collaborative recall and collective memory: What happens when we remember together?. *Memory, 16*(3), 213-230.
<http://dx.doi.org/10.1080/09658210701811862>
- Harshman, R. & Paivio, A. (1987). "Paradoxical" sex differences in self-reported imagery. *Canadian Journal of Psychology/Revue Canadienne De Psychologie, 41*(3), 287-302.
<http://dx.doi.org/10.1037/h0084160>
- Hashtroudi, S., Johnson, M., & Chrosniak, L. (1989). Aging and source monitoring. *Psychology and Aging, 4*(1), 106-112. <http://dx.doi.org/10.1037//0882-7974.4.1.106>
- Heath, W., & Erickson, J. (1998). Memory for central and peripheral actions and props after varied post-event presentation. *Legal and Criminological Psychology, 3*(2), 321-346. doi: 10.1111/j.2044-8333.1998.tb00369.x
- Heath, C. & Gonzalez, R. (1995). Interaction with others increases decision confidence but not decision quality: Evidence against information collection views of interactive decision making. *Organizational Behavior and Human Decision Processes, 61*(3), 305-326.
<http://dx.doi.org/10.1006/obhd.1995.1024>
- Heaton-Armstrong, A. (1987). Police officers notebooks-recent developments. *The Criminal Law Review, 1*, 470-472.

- Heerdink, M., van Kleef, G., Homan, A., & Fischer, A. (2013). On the social influence of emotions in groups: Interpersonal effects of anger and happiness on conformity versus deviance. *Journal of Personality and Social Psychology, 105*(2), 262-284.
<http://dx.doi.org/10.1037/a0033362>
- Henkel, L., Johnson, M., & De Leonardis, D. (1998). Aging and source monitoring: Cognitive processes and neuropsychological correlates. *Journal of Experimental Psychology: General, 127*(3), 251-268. <http://dx.doi.org/10.1037/0096-3445.127.3.251>
- Herbst, J., Zonderman, A., McCrae, R., & Costa, P. (2000). Do the dimensions of the temperament and character inventory map a simple genetic architecture? Evidence from molecular genetics and factor analysis. *American Journal of Psychiatry, 157*(8), 1285-1290.
<http://dx.doi.org/10.1176/appi.ajp.157.8.1285>
- Herlitz, A. & Rehnman, J. (2008). Sex differences in episodic memory. *Current Directions In Psychological Science, 17*(1), 52-56. <http://dx.doi.org/10.1111/j.1467-8721.2008.00547.x>
- Herlitz, A., Nilsson, L., & Bäckman, L. (1997). Gender differences in episodic memory. *Memory & Cognition, 25*(6), 801-811. <http://dx.doi.org/10.3758/bf03211324>
- Hertwig, R., Gigerenzer, G., & Hoffrage, U. (1997). The reiteration effect in hindsight bias. *Psychological Review, 104*(1), 194-202. <http://dx.doi.org/10.1037/0033-295x.104.1.194>
- Hinsz, V., Tindale, R., & Vollrath, D. (1997). The emerging conceptualization of groups as information processors. *Psychological Bulletin, 121*(1), 43-64.
<http://dx.doi.org/10.1037/0033-2909.121.1.43>
- Hirokawa, K., Matsuno, E., Mori, K., & Ukita, J. (2006). Relationship between masculinity-femininity and concession in an experimental collaborative eyewitness testimony. *Asian Journal of Social Psychology, 9*(2), 132-139. <http://dx.doi.org/10.1111/j.1467-839x.2006.00190.x>
- Hoffman, H., Granhag, P., Kwong See, S., & Loftus, E. (2001). Social influences on reality-monitoring decisions. *Memory & Cognition, 29*(3), 394-404.
<http://dx.doi.org/10.3758/bf03196390>
- Hoffner, C., & Levine, K. (2005). Enjoyment of Mediated Fright and Violence: A Meta-Analysis. *Media Psychology, 7*(2), 207-237. doi: 10.1207/s1532785xmep0702_5
- Hogg, M. & Cooper, J. (2003). *The Sage handbook of social psychology*. London: Sage.

- Hogg, M. & Reid, S. (2006). Social identity, self-categorization, and the communication of group norms. *Communication Theory*, 16(1), 7-30. <http://dx.doi.org/10.1111/j.1468-2885.2006.00003.x>
- Hollingshead, A. B., & Brandon, D. P. (2003). Potential benefits of communication in transactive memory systems. *Human communication research*, 29(4), 607-615.
- Home Office (2003). Police and Criminal Evidence Act 1984: Code D. (Version 1.4.2). Retrieved October. 28, 2016 from <http://www.homeoffice.gov.uk/docs/pacecoderevised703.pdf>
- Hope, L., Ost, J., Gabbert, F., Healey, S., & Lenton, E. (2008). "With a little help from my friends...": The role of co-witness relationship in susceptibility to misinformation. *Acta Psychologica*, 127(2), 476-484. <http://dx.doi.org/10.1016/j.actpsy.2007.08.010>
- Hoppe, R. (1962). Memorizing by individuals and groups: A test of the pooling-of-ability model. *The Journal of Abnormal and Social Psychology*, 65(1), 64-67. <http://dx.doi.org/10.1037/h0041843>
- Horry, R., Memon, A., Wright, D., & Milne, R. (2011). Predictors of eyewitness identification decisions from video lineups in England: A field study. *Law and Human Behavior*. 36 (4), 257-265. <http://dx.doi.org/10.1007/s10979-011-9279-z>
- Horselenberg, R., Merckelbach, H., & Josephs, S. (2003). Individual differences and false confessions: A conceptual replication of kassin and kiechel (1996). *Psychology, Crime & Law*, 9(1), 1-8. <http://dx.doi.org/10.1080/10683160308141>
- Howitt, D. (2015). Introduction to forensic and criminal psychology. Harlow: Pearson.
- Huertas, S. & Powell, L. (1986). Effect of appointed leadership on conformity. *Psychological Reports*, 59(2), 679-682. <http://dx.doi.org/10.2466/pr0.1986.59.2.679>
- Hunter, J. & Hunter, R. (1984). Validity and utility of alternative predictors of job performance. *Psychological Bulletin*, 96(1), 72-98. <http://dx.doi.org/10.1037//0033-2909.96.1.72>
- Hupbach, A., Gomez, R., Hardt, O., & Nadel, L. (2007). Reconsolidation of episodic memories: A subtle reminder triggers integration of new information. *Learning & Memory*, 14(1-2), 47-53. <http://dx.doi.org/10.1101/lm.365707>
- Hurley, J. (1990). Does FIRO-B relate better to interpersonal or intrapersonal behavior?. *Journal of Clinical Psychology*, 46(4), 454-460. [http://dx.doi.org/10.1002/1097-4679\(199007\)46:4<454::aid-jclp2270460413>3.0.co;2-k](http://dx.doi.org/10.1002/1097-4679(199007)46:4<454::aid-jclp2270460413>3.0.co;2-k)

- Hutcherson, D. (1965). Junior high school social studies teacher-pupil compatibility-its relation to pupil sex, social level, and indexes of achievement. *The Journal of Educational Research*, 59(1), 39-44. <http://dx.doi.org/10.1080/00220671.1965.10883295>
- Hyde, J. & Linn, M. (1988). Gender differences in verbal ability: A meta-analysis. *Psychological Bulletin*, 104(1), 53-69. <http://dx.doi.org/10.1037/0033-2909.104.1.53>
- Insko, C., Smith, R., Alicke, M., Wade, J., & Taylor, S. (1985). Conformity and group size: The concern with being right and the concern with being liked. *Personality and Social Psychology Bulletin*, 11(1), 41-50. doi:10.1177/0146167285111004
- Instone, D., Major, B., & Bunker, B. (1983). Gender, self confidence, and social influence strategies: An organizational simulation. *Journal of Personality and Social Psychology*, 44(2), 322-333. <http://dx.doi.org/10.1037/0022-3514.44.2.322>
- Irving, B., Hilgendorf, L., & Irving, B. (1980). Police interrogation (1st ed.). London: H.M.S.O.
- Iscoe, I., Williams, M., & Harvey, J. (1963). Modification of children's judgments by a simulated group technique: A normative developmental study. *Child Development*, 34(4), 963. <http://dx.doi.org/10.2307/1126539>
- Jack, F., Zydervelt, S., & Zajac, R. (2013). Are co-witnesses special? Comparing the influence of co-witness and interviewer misinformation on eyewitness reports. *Memory*, 22(3), 243-255. <http://dx.doi.org/10.1080/09658211.2013.778291>
- Jackson, J., Bradford, B., Hough, M., Myhill, A., Quinton, P., & Tyler, T. (2012). Why do people comply with the law?: Legitimacy and the influence of legal institutions. *British Journal of Criminology*, 52(6), 1051-1071. <http://dx.doi.org/10.1093/bjc/azs032>
- Jacoby, L., & Kelley, C. (1992). Unconscious influences of memory: Dissociations and automaticity. *The Neuropsychology of Consciousness*, 201-233. <http://dx.doi.org/10.1016/b978-0-12-498045-7.50015-3>
- Johnson, K. & Fredrickson, B. (2005). "We all look the same to me": Positive emotions eliminate the own-race bias in face recognition. *Psychological Science*, 16(11), 875-881. <http://dx.doi.org/10.1111/j.1467-9280.2005.01631.x>
- Johnson, M., Hashtroudi, S., & Lindsay, D. (1993). Source monitoring. *Psychological Bulletin*, 114(1), 3-28. <http://dx.doi.org/10.1037/0033-2909.114.1.3>
- Johnson, M., Raye, C., Foley, M., & Kim, J. (1982). Pictures and images: Spatial and temporal information compared. *Bulletin of The Psychonomic Society*, 19(1), 23-26. <http://dx.doi.org/10.3758/bf03330029>

- Jonas, E., Schulz-Hardt, S., Frey, D., & Thelen, N. (2001). Confirmation bias in sequential information search after preliminary decisions: an expansion of dissonance theoretical research on selective exposure to information. *Journal of Personality and Social Psychology, 80*(4), 557-571. DOI: 10.1037/0022-3514.80.4.557
- Jones, W., Freemon, J., & Goswick, R. (1981). The persistence of loneliness: Self and other determinants¹. *Journal of Personality, 49*(1), 27-48. <http://dx.doi.org/10.1111/j.1467-6494.1981.tb00844.x>
- Joormann, J., Teachman, B., & Gotlib, I. (2009). Sadder and less accurate? False memory for negative material in depression. *Journal of Abnormal Psychology, 118*(2), 412-417. <http://dx.doi.org/10.1037/a0015621>
- Kaplan, M. & Miller, C. (1987). Group decision making and normative versus informational influence: Effects of type of issue and assigned decision rule. *Journal of Personality and Social Psychology, 53*(2), 306-313. <http://dx.doi.org/10.1037/0022-3514.53.2.306>
- Kausler, D., Lichty, W., & Davis, R. (1985). Temporal memory for performed activities: Intentionality and adult age differences. *Developmental Psychology, 21*(6), 1132-1138. <http://dx.doi.org/10.1037/0012-1649.21.6.1132>
- Kawakami, N., Takai, A., Takatsuka, N., & Shimizu, H. (2000). Eysenck's personality and tobacco/nicotine dependence in male ever-smokers in japan. *Addictive Behaviors, 25*(4), 585-591. [http://dx.doi.org/10.1016/s0306-4603\(99\)00019-2](http://dx.doi.org/10.1016/s0306-4603(99)00019-2)
- Kazdin, A. (2000). *Encyclopedia of psychology*. Washington, D.C.: American Psychological Association.
- Kebbell, M. & Milne, R. (1998). Police officers' perceptions of eyewitness performance in forensic investigations. *The Journal of Social Psychology, 138*(3), 323-330. <http://dx.doi.org/10.1080/00224549809600384>
- Kebbell, M., & Wagstaff, G. (1999). *Face value?*. Great Britain: Home Office, Policing and Reducing Crime Unit.
- Kelman, H. (1958). Compliance, identification, and internalization three processes of attitude change. *Journal of Conflict Resolution, 2*(1), 51-60. <http://dx.doi.org/10.1177/002200275800200106>
- Kidd, J. (1958). Social influence phenomena in a task-oriented group situation. *The Journal of Abnormal and Social Psychology, 56*(1), 13-17. <http://dx.doi.org/10.1037/h0046407>
- Kidder, F. (1870). *History of the Boston Massacre*. Albany, NY: Munsell.

- Kieckhaefer, J. & Wright, D. (2014). Likable co-witnesses increase eyewitness accuracy and decrease suggestibility. *Memory*, 23(3), 462-472.
<http://dx.doi.org/10.1080/09658211.2014.905607>
- Kieckhaefer, J., Vallano, J., & Schreiber Compo, N. (2013). Examining the positive effects of rapport building: When and why does rapport building benefit adult eyewitness memory?. *Memory*, 22(8), 1010-1023. <http://dx.doi.org/10.1080/09658211.2013.864313>
- Kintsch, W. (1970). Recognition memory in bilingual subjects. *Journal of Verbal Learning and Verbal Behavior*, 9(4), 405-409. [http://dx.doi.org/10.1016/s0022-5371\(70\)80080-9](http://dx.doi.org/10.1016/s0022-5371(70)80080-9)
- Kiousis, S. (2001). Public trust or mistrust? Perceptions of media credibility in the information age. *Mass Communication and Society*, 4(4), 381-403.
http://dx.doi.org/10.1207/s15327825mcs0404_4
- Klayman, J. (1995). Varieties of confirmation bias. *Psychology of Learning and Motivation*, 32, 385-418. [http://dx.doi.org/10.1016/s0079-7421\(08\)60315-1](http://dx.doi.org/10.1016/s0079-7421(08)60315-1)
- Klein, R. (1972). Age, sex, and task difficulty as predictors of social conformity. *Journal of Gerontology*, 27(2), 229-236. <http://dx.doi.org/10.1093/geronj/27.2.229>
- Knox, R., Seth, R., McElveen, N., Bergstein, M., & Longo, J. (2007). Short term memory based on gender. Pennsylvania: *Penn State University Press*.
- Koffka (1936). Principles of Gestalt Psychology. *Philosophy*, 11(44), 502.
 doi:10.1017/s0031819100035580
- Koriat, A., Goldsmith, M., & Pansky, A. (2000). Toward a psychology of memory accuracy. *Annual Review of Psychology*, 51(1), 481-537. <http://dx.doi.org/10.1146/annurev.psych.51.1.481>
- Kramer, E. (1967). A contribution toward the validation of the FIRO-B questionnaire. *Journal of Projective Techniques and Personality Assessment*, 31(4), 80-81.
<http://dx.doi.org/10.1080/0091651x.1967.10120397>
- Kramer, T. H., Buckhout, R., & Eugenio, P. (1990). Weapon focus, arousal, and eyewitness memory: Attention must be paid. *Law and Human Behavior*, 14(2), 167.
<http://dx.doi.org/10.1007/BF01062971>.
- Kuehn, L. (1974). Looking down a gun barrel: person perception and violent crime. *Perceptual and Motor Skills*, 39(3), 1159-1164. <http://dx.doi.org/10.2466/pms.1974.39.3.1159>
- Kuhn, D., Weinstock, M., & Flaton, R. (1994). How well do jurors reason? Competence dimensions of individual variation in a juror reasoning task. *Psychological Science*, 5(5), 289-296.
<http://dx.doi.org/10.1111/j.1467-9280.1994.tb00628.x>

- Kumar, J. (1983). Conformity behavior as a function of confederates' age and size of the confederate group. *Personality Study and Group Behaviour*, 3, 69-73.
- Kwong See, S., Hoffman, H., & Wood, T. (2001). Perceptions of an old female eyewitness: Is the older eyewitness believable?. *Psychology and Aging*, 16(2), 346-350.
<http://dx.doi.org/10.1037/0882-7974.16.2.346>
- Lampinen, J. & Smith, V. (1995). The incredible (and sometimes incredulous) child witness: Child eyewitnesses' sensitivity to source credibility cues. *Journal of Applied Psychology*, 80(5), 621-627. <http://dx.doi.org/10.1037//0021-9010.80.5.621>
- Lampinen, J., Faries, J., Neuschatz, J., & Toglia, M. (2000). Recollections of things schematic: the influence of scripts on recollective experience. *Applied Cognitive Psychology*, 14(6), 543-554. [http://dx.doi.org/10.1002/1099-0720\(200011/12\)14:6<543::aid-acp674>3.0.co;2-k](http://dx.doi.org/10.1002/1099-0720(200011/12)14:6<543::aid-acp674>3.0.co;2-k)
- Lampinen, J., Meier, C., Arnal, J., & Leding, J. (2005). Compelling Untruths: Content Borrowing and Vivid False Memories. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 31(5), 954-963. <http://dx.doi.org/10.1037/0278-7393.31.5.954>
- Landau, J., & Marsh, R. (1997). Monitoring source in an unconscious plagiarism paradigm. *Psychonomic Bulletin & Review*, 4(2), 265-270.
<http://dx.doi.org/10.3758/bf03209404>
- Latane, B., & Wolf, S. (1981). The social impact of majorities and minorities. *Psychological Review*, 88(5), 438-453. <http://dx.doi.org/10.1037/0033-295x.88.5.438>
- Latane, B. (1981). The Psychology of social impact. *American Psychologist*, 36 (4), 343-356.
<http://dx.doi.org/10.1037/0003-066X.36.4.343>
- Latané, B., & Harkins, S. (1976). Cross-modality matches suggest anticipated stage fright a multiplicative power function of audience size and status. *Perception & Psychophysics*, 20(6), 482-488. doi:10.3758/bf03208286
- Latane, B., & Nida, S. (1981). Ten years of research on group size and helping. *Psychological Bulletin*, 89(2), 308-324. doi:10.1037//0033-2909.89.2.308
- Leary, M. R., & Baumeister, R. F. (2000). The nature and function of self-esteem: Sociometer theory. In M. P. Zanna (Ed.), *Advances in experimental social psychology*. 32, 1-62. New York: Academic Press.
- Leippe, M., Eisenstadt, D., Rauch, S., & Stambush, M. (2006). Effects of social-comparative memory feedback on eyewitnesses' identification confidence, suggestibility, and

- retrospective memory reports. *Basic and Applied Social Psychology*, 28(3), 201-220.
http://dx.doi.org/10.1207/s15324834basp2803_1
- Levett, L. (2011). Co-witness information influences whether a witness is likely to choose from a lineup. *Legal and Criminological Psychology*, 18(1), 168-180.
<http://dx.doi.org/10.1111/j.2044-8333.2011.02033.x>
- Levine, B., Svoboda, E., Hay, J., Winocur, G., & Moscovitch, M. (2002). Aging and autobiographical memory: Dissociating episodic from semantic retrieval. *Psychology and Aging*, 17(4), 677-689. <http://dx.doi.org/10.1037/0882-7974.17.4.677>
- Levine, T., Park, H., & McCornack, S. (1999). Accuracy in detecting truths and lies: Documenting the "veracity effect". *Communication Monographs*, 66(2), 125-144.
<http://dx.doi.org/10.1080/03637759909376468>
- Lewin, C., Wolgers, G., & Herlitz, A. (2001). Sex differences favoring women in verbal but not in visuospatial episodic memory. *Neuropsychology*, 15(2), 165-173.
<http://dx.doi.org/10.1037/0894-4105.15.2.165>
- Liebman, J., McKinley-Pace, M., Leonard, A., Sheesley, L., Gallant, C., Renkey, M., & Lehman, E. (2002). Cognitive and psychosocial correlates of adults' eyewitness accuracy and suggestibility. *Personality and Individual Differences*, 33(1), 49-66.
[http://dx.doi.org/10.1016/s0191-8869\(01\)00135-0](http://dx.doi.org/10.1016/s0191-8869(01)00135-0)
- Lindsay, D. (2007). Autobiographical memory, eyewitness reports, and public policy. *Canadian Psychology/Psychologie Canadienne*, 48(2), 57-66. <http://dx.doi.org/10.1037/cp2007007>
- Lippa, R. (2002). *Gender, nature, and nurture* (1st ed.). Mahwah, N.J.: L. Erlbaum.
- Lirgg, C. D. (1991). Gender differences in self-confidence in physical activity: A meta-analysis of recent studies. *Journal of Sport and Exercise Psychology*, 8(1), 294-310.
- Loftus, E. & Hoffman, H. (1989). Misinformation and memory: The creation of new memories. *Journal of Experimental Psychology: General*, 118(1), 100-104.
<http://dx.doi.org/10.1037/0096-3445.118.1.100>
- Loftus, E. F. (1979). The malleability of human memory: Information introduced after we view an incident can transform memory. *American Scientist*, 67(3), 312-320.
- Loftus, E. F. (2005). Planting misinformation in the human mind: A 30-year investigation of the malleability of memory. *Learning & Memory*, 12(4), 361-366.
<http://dx.doi.org/10.1101/lm.94705>

- Loftus, E. F., Feldman, J., & Dashiell, R. (1995). The reality of illusory memories. In: Schacter, D. (2000). *Memory distortion*. Cambridge, Mass.: Harvard University Press. 47-68
- Loftus, E., & Greene, E. (1980). Warning: Even memory for faces may be contagious. *Law and Human Behavior*, 4(4), 323-334. <http://dx.doi.org/10.1007/bf01040624>
- Loftus, E., & Loftus, G. (1980). On the permanence of stored information in the human brain. *American Psychologist*, 35(5), 409-420. <http://dx.doi.org/10.1037/0003-066x.35.5.409>
- Loftus, E., & Palmer, J. (1974). Reconstruction of automobile destruction: An example of the interaction between language and memory. *Journal of Verbal Learning and Verbal Behavior*, 13(5), 585-589. [http://dx.doi.org/10.1016/s0022-5371\(74\)80011-3](http://dx.doi.org/10.1016/s0022-5371(74)80011-3)
- Loftus, E., Levidow, B., & Duensing, S. (1992). Who remembers best? Individual differences in memory for events that occurred in a science museum. *Applied Cognitive Psychology*, 6(2), 93-107. <http://dx.doi.org/10.1002/acp.2350060202>
- Loftus, E., Miller, D., & Burns, H. (1978). Semantic integration of verbal information into a visual memory. *Journal of Experimental Psychology: Human Learning and Memory*, 4(1), 19-31. <http://dx.doi.org/10.1037/0278-7393.4.1.19>
- Louis, W. (2005). Normative influence and rational conflict decisions: group norms and cost-benefit analyses for intergroup behavior. *Group Processes & Intergroup Relations*, 8(4), 355-374. <http://dx.doi.org/10.1177/1368430205056465>
- Luna, K., & Migueles, M. (2009). Acceptance and Confidence of Central and Peripheral Misinformation. *The Spanish Journal of Psychology*, 12(02), 405-413. doi: 10.1017/s1138741600001797
- Lundeberg, M., Fox, P., & Puncchohar, J. (1994). Highly confident but wrong: Gender differences and similarities in confidence judgments. *Journal of Educational Psychology*, 86(1), 114-121. <http://dx.doi.org/10.1037/0022-0663.86.1.114>
- Luus, C., & Wells, G. (1994). The malleability of eyewitness confidence: Co-witness and perseverance effects. *Journal of Applied Psychology*, 79(5), 714-723. <http://dx.doi.org/10.1037/0021-9010.79.5.714>
- Maass, A. & Clark, R. (1983). Internalization versus compliance: Differential processes underlying minority influence and conformity. *European Journal of Social Psychology*, 13(3), 197-215. <http://dx.doi.org/10.1002/ejsp.2420130302>

- Maccoby, E. & Jacklin, C. (1974). *The psychology of sex differences*. Stanford, Calif.: Stanford University Press.
- Mahé, A., Corson, Y., Verrier, N., & Payoux, M. (2015). Misinformation effect and centrality. *Revue Européenne De Psychologie Appliquée/European Review of Applied Psychology*, 65(3), 155-162. doi: 10.1016/j.erap.2015.03.001
- Mahoney, J. M., & Stasson, M. F. (2005). Interpersonal and personality dimensions of behavior: FIRO-B and the Big Five. *North American Journal of Psychology*, 7(2), 205-216.
- Malof, M. & Lott, A. (1962). Ethnocentrism and the acceptance of Negro support in a group pressure situation. *The Journal of Abnormal and Social Psychology*, 65(4), 254-258. <http://dx.doi.org/10.1037/h0044518>
- Malpass, R. & Devine, P. (1980). Realism and eyewitness identification research. *Law and Human Behavior*, 4(4), 347-358. <http://dx.doi.org/10.1007/bf01040626>
- Manning, C. & Loftus, E. (1996). Eyewitness testimony and memory distortion. *Japanese Psychological Research*, 38(1), 5-13. <http://dx.doi.org/10.1111/j.1468-5884.1996.tb00003.x>
- Marques, J. & Paez, D. (1994). The 'black sheep effect': social categorization, rejection of ingroup deviates, and perception of group variability. *European Review of Social Psychology*, 5(1), 37-68. <http://dx.doi.org/10.1080/14792779543000011>
- Martin, R. & Hewstone, M. (2003). Majority versus minority influence: when, not whether, source status instigates heuristic or systematic processing. *European Journal of Social Psychology*, 33(3), 313-330. <http://dx.doi.org/10.1002/ejsp.146>
- Mazanec, N. & Mccall, G. (1975). Sex, cognitive categories, and observational accuracy. *Psychological Reports*, 37(3), 987-990. <http://dx.doi.org/10.2466/pr0.1975.37.3.987>
- Mccall, G., Mazanec, N., Erickson, W., & Smith, H. (1974). Same-sex recall effects in tests of observational accuracy. *Perceptual and Motor Skills*, 38(3), 830-830. <http://dx.doi.org/10.2466/pms.1974.38.3.830>
- McCloskey, M. & Egeth, H. (1983). Eyewitness identification: What can a psychologist tell a jury?. *American Psychologist*, 38(5), 550-563. <http://dx.doi.org/10.1037/0003-066x.38.5.550>

- McCloskey, M., & Zaragoza, M. (1985). Misleading postevent information and memory for events: Arguments and evidence against memory impairment hypotheses. *Journal of Experimental Psychology: General*, 114(1), 1-16. <http://dx.doi.org/10.1037/0096-3445.114.1.1>
- Mccornack, S. & Parks, M. (1986). Deception detection and relationship development: The other side of trust. *Annals of The International Communication Association*, 9(1), 377-389. <http://dx.doi.org/10.1080/23808985.1986.11678616>
- McFarlin, D., & Blascovich, J. (1981). Effects of self-esteem and performance feedback on future affective preferences and cognitive expectations. *Journal of Personality and Social Psychology*, 40(3), 521-531. <http://dx.doi.org/10.1037/0022-3514.40.3.521>
- McIntyre, J. & Craik, F. (1987). Age differences in memory for item and source information. *Canadian Journal of Psychology/Revue Canadienne De Psychologie*, 41(2), 175-192. <http://dx.doi.org/10.1037/h0084154>
- McKay, M., Boduszek, D., & Harvey, S. (2014). The Rosenberg self-esteem scale: A bifactor answer to a two-factor question?. *Journal of Personality Assessment*, 96(6), 654-660. <http://dx.doi.org/10.1080/00223891.2014.923436>
- Mckelvey, W., & Kerr, N. (1988). Differences in conformity among friends and strangers. *Psychological Reports*, 62(3), 759-762. doi:10.2466/pr0.1988.62.3.759
- McKelvie, S. (1981). Sex differences in memory for faces. *The Journal of Psychology*, 107(1), 109-125. <http://dx.doi.org/10.1080/00223980.1981.9915211>
- Meade, M. & Roediger, H. (2002). Explorations in the social contagion of memory. *Memory & Cognition*, 30(7), 995-1009. <http://dx.doi.org/10.3758/bf03194318>
- Meade, M., & Roediger, H. (2009). Age differences in collaborative memory: the role of retrieval manipulations. *Memory & Cognition*, 37(7), 962-975. <http://dx.doi.org/10.3758/mc.37.7.962>
- Megreya, A., Bindemann, M., & Havard, C. (2011). Sex differences in unfamiliar face identification: Evidence from matching tasks. *Acta Psychologica*, 137(1), 83-89. <http://dx.doi.org/10.1016/j.actpsy.2011.03.003>
- Meier, B. (1994). Simpson team taking aim at dna laboratory. *The New York Times*. Retrieved from <http://www.nytimes.com/1994/09/07/us/simpson-team-taking-aim-at-dna-laboratory.html>
- Meissner, C. & Brigham, J. (2001). Thirty years of investigating the own-race bias in memory for faces: A meta-analytic review. *Psychology, Public Policy, and Law*, 7(1), 3-35. <http://dx.doi.org/10.1037/1076-8971.7.1.3>

- Memon, A., & Wright, D. B. (1999). Eyewitness testimony and the Oklahoma bombing. *The Psychologist*, 12(6), 292-295
- Memon, A., Bartlett, J., Rose, R., & Gray, C. (2003). The aging eyewitness: Effects of age on face, delay, and source-memory ability. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 58(6), P338-P345.
<http://dx.doi.org/10.1093/geronb/58.6.p338>
- Memon, A., Dalton, G., Horry, R., Mine, R., & Wright, D. (2016). How do witnesses fare with video identification parades, and are police forces following good practice? Researchers into real cases on both sides of the border present their findings. *The Journal Online*. Retrieved from <http://www.journalonline.co.uk/Magazine/57-11/1011839.aspx>
- Memon, A., Hope, L., & Gabbert, F. (2002). 'Gut feeling. In Eyewitness expectations and identifications. Paper presented at the American Psychology-Law Society Meeting, Austin, Texas (Vol. 202).
- Memon, A., Zaragoza, M., Clifford, B., & Kidd, L. (2010). Inoculation or antidote? The effects of cognitive interview timing on false memory for forcibly fabricated events. *Law and Human Behavior*, 34(2), 105-117. <http://dx.doi.org/10.1007/s10979-008-9172-6>
- Merckelbach, H., Muris, P., Rassin, E., & Horselenberg, R. (2000). Dissociative experiences and interrogative suggestibility in college students. *Personality and Individual Differences*, 29(6), 1133-1140. [http://dx.doi.org/10.1016/s0191-8869\(99\)00260-3](http://dx.doi.org/10.1016/s0191-8869(99)00260-3)
- Migueles, M., & Garcia-Bajos, E. (1999). Recall, recognition, and confidence patterns in eyewitness testimony. *Applied Cognitive Psychology*, 13(3), 257-268. doi: 10.1002/(sici)1099-0720(199906)13:3<257::aid-acp566>3.0.co;2-7
- Milgram, S. (1963). Behavioral study of obedience. *The Journal of Abnormal and Social Psychology*, 67(4), 371-378. <http://dx.doi.org/10.1037/h0040525>
- Miner, J. (1962). Conformity among university professors and business executives. *Administrative Science Quarterly*, 7(1), 96-109. <http://dx.doi.org/10.2307/2390635>
- Mitchell, K., Johnson, M., & Mather, M. (2002). Source monitoring and suggestibility to misinformation: adult age-related differences. *Applied Cognitive Psychology*, 17(1), 107-119. <http://dx.doi.org/10.1002/acp.857>
- Mitchell, K., Livosky, M., & Mather, M. (1998). The weapon focus effect revisited: The role of novelty. *Legal and Criminological Psychology*, 3(2), 287-303.
<http://dx.doi.org/10.1111/j.2044-8333.1998.tb00367.x>

- Moffat, S. (2001). Age differences in spatial memory in a virtual environment navigation task. *Neurobiology of Aging*, 22(5), 787-796. [http://dx.doi.org/10.1016/s0197-4580\(01\)00251-2](http://dx.doi.org/10.1016/s0197-4580(01)00251-2)
- Mojtahedi, D. (2017). New research reveals how little we can trust eyewitnesses. *The Conversation*. Retrieved from <https://theconversation.com/new-research-reveals-how-little-we-can-trust-eyewitnesses-67663>
- Mojtahedi, D., Ioannou, M. and Hammond, L. (2017). Personality correlates of co-witness suggestibility. *Journal of Forensic Psychology Research and Practice*. 17 (4), 249-274. DOI: 10.1080/24732850.2017.1358996
- Moore, T., Richards, B., & Hood, J. (1984). Aging and the coding of spatial information. *Journal of Gerontology*, 39(2), 210-212. <http://dx.doi.org/10.1093/geronj/39.2.210>
- Morgan, C., Southwick, S., Steffian, G., Hazlett, G., & Loftus, E. (2013). Misinformation can influence memory for recently experienced, highly stressful events. *International Journal of Law and Psychiatry*, 36(1), 11-17. <http://dx.doi.org/10.1016/j.ijlp.2012.11.002>
- Mori, K. (2003). Surreptitiously projecting different movies to two subsets of viewers. *Behavior Research Methods, Instruments, & Computers*, 35(4), 599-604. <http://dx.doi.org/10.3758/bf03195539>
- Mori, K. (2007). A revised method for projecting two different movies to two groups of viewers without their noticing the duality. *Behavior Research Methods*, 39(3), 574-578. <http://dx.doi.org/10.3758/bf03193028>
- Mori, K., & Mori, H. (2008). Conformity among cowitnesses sharing same or different information about an event in experimental collaborative eyewitness testimony. *Perceptual and Motor Skills*, 106(1), 275-290. <http://dx.doi.org/10.2466/pms.106.1.275-290>
- Morris, W. & Miller, R. (1975). The effects of consensus-breaking and consensus-preempting partners on reduction of conformity. *Journal of Experimental Social Psychology*, 11(3), 215-223. [http://dx.doi.org/10.1016/s0022-1031\(75\)80023-0](http://dx.doi.org/10.1016/s0022-1031(75)80023-0)
- Mudd, K., & Govern, J. M. (2004) Conformity to misinformation and time delay negatively affect eyewitness confidence and accuracy. *North American Journal of Psychology*, 6(2), 227-238.
- Mullen, B. (1983). Operationalizing the effect of the group on the individual: A self-attention perspective. *Journal of Experimental Social Psychology*, 19(4), 295-322. doi:10.1016/0022-1031(83)90025-2
- Murdock, B. B. (1974). Human memory: Theory and data. *Lawrence Erlbaum*.

- Myers, I. & Briggs, K. (1962). *The Myers-Briggs type indicator*. Palo Alto, Calif.: Consulting Psychologists Press [distributor].
- Naveh-Benjamin, M., Hussain, Z., Guez, J., & Bar-On, M. (2003). Adult age differences in episodic memory: Further support for an associative-deficit hypothesis. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 29(5), 826-837.
<http://dx.doi.org/10.1037/0278-7393.29.5.826>
- Naydenova, I. N. (2007) Development and validation of the control in relationships scale. *Masters Thesis, University of Tennessee*.
- Newman, J., Ewing, S., McColl, R., Borus, J., Nierenberg, A., Pava, J., & Fava, M. (2000). Tridimensional personality questionnaire and treatment response in major depressive disorder: a negative study. *Journal of Affective Disorders*, 57(3), 241-247.
[http://dx.doi.org/10.1016/s0165-0327\(99\)00046-4](http://dx.doi.org/10.1016/s0165-0327(99)00046-4)
- Nickerson, R. (1998). Confirmation bias: A ubiquitous phenomenon in many guises. *Review of General Psychology*, 2(2), 175-220. <http://dx.doi.org/10.1037//1089-2680.2.2.175>
- Nolan, J., Schultz, P., Cialdini, R., Goldstein, N., & Griskevicius, V. (2008). Normative social influence is underdetected. *Personality and Social Psychology Bulletin*, 34(7), 913-923.
<http://dx.doi.org/10.1177/0146167208316691>
- Nordholm, L. (1975). Effects of group size and stimulus ambiguity on conformity. *The Journal of Social Psychology*, 97(1), 123-130. <http://dx.doi.org/10.1080/00224545.1975.9923321>
- Nourkova, V., Bernstein, D., & Loftus, E. (2004). Altering traumatic memory. *Cognition & Emotion*, 18(4), 575-585. <http://dx.doi.org/10.1080/02699930341000455>
- Nyberg, L., Backman, L., Erngrund, K., Olofsson, U., & Nilsson, L. (1996). Age differences in episodic memory, semantic memory, and priming: relationships to demographic, intellectual, and biological factors. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 51B (4), 234-240.
<http://dx.doi.org/10.1093/geronb/51b.4.p234>
- Odegard, T., & Lampinen, J. (2004). Memory conjunction errors for autobiographical events: More than just familiarity. *Memory*, 12(3), 288-300.
<http://dx.doi.org/10.1080/09658210244000621>
- O'Rourke, T., Penrod, S., Cutler, B., & Stuve, T. (1989). The external validity of eyewitness identification research: Generalizing across subject populations. *Law and Human Behavior*, 13(4), 385-395. <http://dx.doi.org/10.1007/bf01056410>

- Ost, J., Ghonouie, H., Cook, L., & Vrij, A. (2008). The effects of confederate influence and confidence on the accuracy of crime judgements. *Acta Psychologica, 128*(1), 25-32. <http://dx.doi.org/10.1016/j.actpsy.2007.09.007>
- Ost, J., Hogbin, I., & Granhag, P. (2006). Altering false reports via confederate influence. *Social Influence, 1*(2), 105-116. <http://dx.doi.org/10.1080/15534510500480273>
- Palma, G. & McClosky, H. (1970). Personality and conformity: The learning of political attitudes. *The American Political Science Review, 64*(4), 1054-1073. <http://dx.doi.org/10.2307/1958357>
- Parks, C., Sanna, L., & Berel, S. (2001). Actions of similar others as inducements to cooperate in social dilemmas. *Personality and Social Psychology Bulletin, 27*(3), 345-354. <http://dx.doi.org/10.1177/0146167201273008>
- Paterson, H., & Kemp, R. (2005). Co-witness Discussion: A survey of police officers' attitudes, knowledge, and behaviour. *Psychiatry, Psychology and Law, 12*(2), 424-434. <http://dx.doi.org/10.1375/pplt.12.2.424>
- Paterson, H., & Kemp, R. (2006a). Co-witnesses talk: A survey of eyewitness discussion. *Psychology, Crime & Law, 12*(2), 181-191. <http://dx.doi.org/10.1080/10683160512331316334>
- Paterson, H. & Kemp, R. (2006b). Comparing methods of encountering post-event information: the power of co-witness suggestion. *Applied Cognitive Psychology, 20*(8), 1083-1099. <http://dx.doi.org/10.1002/acp.1261>
- Paterson, H., Chapman, L., & Kemp, R. (2007). The effects of false memory feedback on susceptibility to co-witness misinformation. *Paper accepted for the 3rd International Congress of Psychology and Law, 12*, 181-191.
- Paterson, H., Kemp, R., & Forgas, J. (2009). Co-Witnesses, confederates, and conformity: Effects of discussion and delay on eyewitness memory. *Psychiatry, Psychology and Law, 16*(sup1), 112-124. <http://dx.doi.org/10.1080/13218710802620380>
- Paterson, H., Kemp, R., & McIntyre, S. (2012). Can a witness report hearsay evidence unintentionally? The effects of discussion on eyewitness memory. *Psychology, Crime & Law, 18*(6), 505-527. <http://dx.doi.org/10.1080/1068316x.2010.510117>
- Paterson, H., Kemp, R., & Ng, J. (2011). Combating Co-witness contamination: Attempting to decrease the negative effects of discussion on eyewitness memory. *Applied Cognitive Psychology, 25*(1), 43-52. <http://dx.doi.org/10.1002/acp.1640>

- Payne, B. & Chappell, A. (2008). Using student samples in criminological research. *Journal of Criminal Justice Education*, 19(2), 175-192.
<http://dx.doi.org/10.1080/10511250802137226>
- Payne, D., Toglia, M., & Anastasi, J. (1994). Recognition performance level and the magnitude of the misinformation effect in eyewitness memory. *Psychonomic Bulletin & Review*, 1(3), 376-382. <http://dx.doi.org/10.3758/bf03213978>
- Payne, J., Jackson, E., Hoscheidt, S., Ryan, L., Jacobs, W., & Nadel, L. (2007). Stress administered prior to encoding impairs neutral but enhances emotional long-term episodic memories. *Learning & Memory*, 14(12), 861-868. <http://dx.doi.org/10.1101/lm.743507>
- Paz-Alonso, P., Goodman, G., & Ibabe, I. (2013). Adult eyewitness memory and compliance: effects of post-event misinformation on memory for a negative event. *Behavioral Sciences & The Law*, 31(5), 541-558. <http://dx.doi.org/10.1002/bsl.2081>
- Penrod, S., & Hastie, R. (1980). A computer simulation of jury decision making. *Psychological Review*, 87(2), 133-159. doi:10.1037/0033-295x.87.2.133
- Perfect, T. (2004). The role of self-rated ability in the accuracy of confidence judgements in eyewitness memory and general knowledge. *Applied Cognitive Psychology*, 18(2), 157-168. <http://dx.doi.org/10.1002/acp.952>
- Pezdek, K. (1983). Memory for items and their spatial locations by young and elderly adults. *Developmental Psychology*, 19(6), 895-900. <http://dx.doi.org/10.1037/0012-1649.19.6.895>
- Piaget, J. (1954). *The construction of reality in the child*. New York: Basic Books.
- Pishkin, V. (1960). Effects of probability of misinformation and number of irrelevant dimensions upon concept identification. *Journal of Experimental Psychology*, 59(6), 371-378. <http://dx.doi.org/10.1037/h0046615>
- Platt, R. D., Lacey, S. C., Iobst, A. D., & Finkelman, D. (1998). Absorption, dissociation, and fantasy-proneness as predictors of memory distortion in autobiographical and laboratory-generated memories. *Applied Cognitive Psychology*, 12(7), S77-S89.
- Pliske, R. & Mutter, S. (1996). Age differences in the accuracy of confidence judgments. *Experimental Aging Research*, 22(2), 199-216. <http://dx.doi.org/10.1080/03610739608254007>
- Poorman, P., & Seelau, S. (2001). Lesbians who abuse their partners. *Women & Therapy*, 23(3), 87-105. http://dx.doi.org/10.1300/j015v23n03_07

- Porter, H. (1939). Studies in the psychology of stuttering. *Journal of Speech Disorders*, 4(4), 323. doi:10.1044/jshd.0404.323
- Porter, S., & Birt, A. (2001). Is traumatic memory special? A comparison of traumatic memory characteristics with memory for other emotional life experiences. *Applied Cognitive Psychology*, 15(7), 101-117. <http://dx.doi.org/10.1002/acp.766>
- Porter, S., Birt, A., Yuille, J., & Lehman, D. (2000). Negotiating false memories: Interviewer and rememberer characteristics relate to memory distortion. *Psychological Science*, 11(6), 507-510. <http://dx.doi.org/10.1111/1467-9280.00297>
- Powers, P., Andriks, J., & Loftus, E. (1979). Eyewitness accounts of females and males. *Journal of Applied Psychology*, 64(3), 339-347. <http://dx.doi.org/10.1037//0021-9010.64.3.339>
- Pozzulo, J., Crescini, C., Lemieux, J., & Tawfik, A. (2007). The effect of shyness on eyewitness memory and the susceptibility to misinformation. *Personality and Individual Differences*, 43(7), 1656-1666. <http://dx.doi.org/10.1016/j.paid.2007.05.001>
- Pozzulo, J., Dempsey, J., Crescini, C., & Lemieux, J. (2009). Examining the relation between eyewitness recall and recognition for children and adults. *Psychology, Crime & Law*, 15(5), 409-424. <http://dx.doi.org/10.1080/10683160802279625>
- Pulford, B. & Sohal, H. (2006). The influence of personality on HE students' confidence in their academic abilities. *Personality and Individual Differences*, 41(8), 1409-1419. <http://dx.doi.org/10.1016/j.paid.2006.05.010>
- Qin, J., Ogle, C., & Goodman, G. (2008). Adults' memories of childhood: True and false reports. *Journal of Experimental Psychology: Applied*, 14(4), 373-391. <http://dx.doi.org/10.1037/a0014309>
- Radvansky, G. A. (2017). Human memory. Routledge: New York.
- Read, J., Tollestrup, P., Hammersley, R., McFadzen, E., & Christensen, A. (1990). The unconscious transference effect: Are innocent bystanders ever misidentified?. *Applied Cognitive Psychology*, 4(1), 3-31. <http://dx.doi.org/10.1002/acp.2350040103>
- Rehman, J. & Herlitz, A. (2007). Women remember more faces than men do. *Acta Psychologica*, 124(3), 344-355. <http://dx.doi.org/10.1016/j.actpsy.2006.04.004>
- Reinhold, R. (1990). The longest trial - a post-mortem collapse of child-abuse case: So much agony for so little. *The New York Times*. Retrieved from <http://www.nytimes.com/1990/01/24/us/longest-trial-post-mortem-collapse-child-abuse-case-so-much-agony-for-so-little.html>

- Reitan, H. T. (1969). Conformity, majority effect and perceived competence, PhD, University of Florida, Florida. *Dissertation Abstracts International*, 29B.
- Remijn, C., & Crombag, H. (2007). Heuristics in causal reasoning and their influence on eyewitness testimony. *Psychology, Crime & Law*, 13(2), 201-211. doi: 10.1080/10683160600711688
- Rhodes, N. & Wood, W. (1992). Self-esteem and intelligence affect influenceability: The mediating role of message reception. *Psychological Bulletin*, 111(1), 156-171.
<http://dx.doi.org/10.1037//0033-2909.111.1.156>
- Ridgers, N., Fazey, D., & Fairclough, S. (2007). Perceptions of athletic competence and fear of negative evaluation during physical education. *British Journal of Educational Psychology*, 77(2), 339-349. <http://dx.doi.org/10.1348/026151006x128909>
- Ridley, A., & Clifford, B. (2004). The effects of anxious mood induction on suggestibility to misleading post-event information. *Applied Cognitive Psychology*, 18(2), 233-244.
<http://dx.doi.org/10.1002/acp.963>
- Roberts, P. (2002). Vulnerability to false memory: The effects of stress, imagery, trait anxiety, and depression. *Current Psychology*, 21(3), 240-252. <http://dx.doi.org/10.1007/s12144-002-1016-9>
- Robinson, M., & Johnson, J. (1996). Recall memory, recognition memory, and the eyewitness confidence-accuracy correlation. *Journal of Applied Psychology*, 81(5), 587-594.
<http://dx.doi.org/10.1037//0021-9010.81.5.587>
- Roebbers, C. & Schneider, W. (2000). The impact of misleading questions on eyewitness memory in children and adults. *Applied Cognitive Psychology*, 14(6), 509-526.
[http://dx.doi.org/10.1002/1099-0720\(200011/12\)14:6<509::aid-acp668>3.3.co;2-n](http://dx.doi.org/10.1002/1099-0720(200011/12)14:6<509::aid-acp668>3.3.co;2-n)
- Roebbers, C. & Schneider, W. (2001). Individual differences in children's eyewitness recall: The influence of intelligence and shyness. *Applied Developmental Science*, 5(1), 9-20.
http://dx.doi.org/10.1207/s1532480xads0501_2
- Roebbers, C., & McConkey, K. (2003). Mental reinstatement of the misinformation context and the misinformation effect in children and adults. *Applied Cognitive Psychology*, 17(4), 477-493.
<http://dx.doi.org/10.1002/acp.886>
- Roediger, H. & McDermott, K. (1995). Creating false memories: Remembering words not presented in lists. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 21(4), 803-814. <http://dx.doi.org/10.1037//0278-7393.21.4.803>

- Roediger, H. (1980). Memory metaphors in cognitive psychology. *Memory & Cognition*, 8(3), 231-246. <http://dx.doi.org/10.3758/bf03197611>
- Roediger, H., Meade, M., & Bergman, E. (2001). Social contagion of memory. *Psychonomic Bulletin & Review*, 8(2), 365-371. <http://dx.doi.org/10.3758/bf03196174>
- Roper, R. & Shewan, D. (2002). Compliance and eyewitness testimony: Do eyewitnesses comply with misleading 'expert pressure' during investigative interviewing?. *Legal and Criminological Psychology*, 7(2), 155-163. <http://dx.doi.org/10.1348/135532502760274765>
- Rosenberg, L. (1961). Group size, prior experience, and conformity. *The Journal of Abnormal and Social Psychology*, 63(2), 436-437. <http://dx.doi.org/10.1037/h0047007>
- Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton, N.J.: Princeton University Press.
- Ross, D., Ceci, S., Dunning, D., & Toglia, M. (1994). Unconscious transference and mistaken identity: When a witness misidentifies a familiar but innocent person. *Journal of Applied Psychology*, 79(6), 918-930. <http://dx.doi.org/10.1037/0021-9010.79.6.918>
- Rubin, R., Perse, E., & Barbato, C. (1988). Conceptualization and measurement of interpersonal communication motives. *Human Communication Research*, 14(4), 602-628. <http://dx.doi.org/10.1111/j.1468-2958.1988.tb00169.x>
- Ryan, B., Maguire, T., & Ryan, T. (1970). An examination of the construct validity of the FIRO-B. *Journal of Projective Techniques and Personality Assessment*, 34(5), 419-425. <http://dx.doi.org/10.1080/0091651x.1970.10380277>
- Salthouse, T. & Siedlecki, K. (2007). An Individual difference analysis of false recognition. *The American Journal of Psychology*, 120(3), 429. <http://dx.doi.org/10.2307/20445413>
- Sawilowsky, S. (2009). New effect size rules of thumb. *Journal of Modern Applied Statistical Methods*, 8(2), 597-599. <http://dx.doi.org/10.22237/jmasm/1257035100>
- Schacter, D. (2000). *Memory distortion*. Cambridge, Mass.: Harvard University Press.
- Schacter, D. (2001). *The seven sins of memory*. Estados Unidos: PT Partners L. P.
- Schacter, D., Guerin, S., & St. Jacques, P. (2011). Memory distortion: an adaptive perspective. *Trends in Cognitive Sciences*, 15(10), 467-474. doi:10.1016/j.tics.2011.08.004
- Schacter, D., Osowiecki, D., Kaszniak, A., Kihlstrom, J., & Valdiserri, M. (1994). Source memory: Extending the boundaries of age-related deficits. *Psychology and Aging*, 9(1), 81-89. <http://dx.doi.org/10.1037/0882-7974.9.1.81>

- Schaffer, H. (1996). *Social development*. Oxford Blackwell Publishers.:
- Schlenker, B., & Leary, M. (1982). Social anxiety and self-presentation: A conceptualization model. *Psychological Bulletin*, 92(3), 641-669. doi:10.1037//0033-2909.92.3.641
- Schmechel, R. S., O'Toole, T. P., Easterly, C., & Loftus, E. F. (2006). Beyond the ken? Testing jurors' understanding of eyewitness reliability evidence. *Jurimetrics*, 177-214.
- Schmidt, F., Mack, M., & Hunter, J. (1984). Selection utility in the occupation of U.S. park ranger for three modes of test use. *Journal of Applied Psychology*, 69(3), 490-497. <http://dx.doi.org/10.1037//0021-9010.69.3.490>
- Schneider, D., & Watkins, M. (1996). Response conformity in recognition testing. *Psychonomic Bulletin & Review*, 3(4), 481-485. <http://dx.doi.org/10.3758/bf03214550>
- Schutz, W. (1958). *FIRO; a three-dimensional theory of interpersonal behavior*. New York: Rinehart.
- Schutz, W. (1978). *FIRO awareness scales manual* (1st ed.). Palo Alto, Calif.: Consulting Psychologists Press.
- Schwartz, E. (2013). Eyewitness memory: effects of social pressure and gender on memory conformity. *Towson University Institutional Repository*.
- Schwartz, S., & Wright, D. (2012). Memory conformity for new and old items with immediate and delayed testing. *Applied Cognitive Psychology*, 26(4), 508-515. <http://dx.doi.org/10.1002/acp.2820>
- Schwarz, S. & Roebbers, C. (2006). Age differences in the effects of social influence on children's eyewitness performance and their metacognitive monitoring. *Journal of Experimental Child Psychology*, 94(3), 229-248. doi:10.1016/j.jecp.2006.01.003
- Scoboria, A., Mazzoni, G., Kirsch, I., & Jimenez, S. (2006). The effects of prevalence and script information on plausibility, belief, and memory of autobiographical events. *Applied Cognitive Psychology*, 20(8), 1049-1064. <http://dx.doi.org/10.1002/acp.1240>
- Searcy, J., Bartlett, J., & Memon, A. (1999). Age differences in accuracy and choosing in eyewitness identification and face recognition. *Memory & Cognition*, 27(3), 538-552. <http://dx.doi.org/10.3758/bf03211547>
- Seidnitz, L. & Diener, E. (1998). Sex differences in the recall of affective experiences. *Journal of Personality and Social Psychology*, 74(1), 262-271. <http://dx.doi.org/10.1037/0022-3514.74.1.262>

- Semmler, C., Brewer, N., & Wells, G. (2004). Effects of postidentification feedback on eyewitness identification and nonidentification confidence. *Journal of Applied Psychology, 89*(2), 334-346. <http://dx.doi.org/10.1037/0021-9010.89.2.334>
- Shapiro, P. & Penrod, S. (1986). Meta-analysis of facial identification studies. *Psychological Bulletin, 100*(2), 139-156. <http://dx.doi.org/10.1037/0033-2909.100.2.139>
- Sharp, G., Cutler, B., & Penrod, S. (1988). Performance feedback improves the resolution of confidence judgments. *Organizational Behavior and Human Decision Processes, 42*(3), 271-283. [http://dx.doi.org/10.1016/0749-5978\(88\)90001-5](http://dx.doi.org/10.1016/0749-5978(88)90001-5)
- Shaw, J., Bjork, R., & Handal, A. (1995). Retrieval-induced forgetting in an eyewitness-memory paradigm. *Psychonomic Bulletin & Review, 2*(2), 249-253. <http://dx.doi.org/10.3758/bf03210965>
- Shaw, J., Garven, S., & Wood, J. (1997). Co-witness information can have immediate effects on eyewitness memory reports. *Law and Human Behavior, 21*(5), 503-523. <http://dx.doi.org/10.1023/a:1024875723399>
- Sherif, M. (1961). Conformity-deviation, norms, and group relations. New York: *Harper and Brothers*.
- Sherif, M. (1936). *The psychology of social norms*. New York and London: Harper & Brothers.
- Sigvardsson, S., Bohman, M., & Cloninger, C. (1987). Structure and stability of childhood personality: prediction of later social adjustment. *Journal of Child Psychology & Psychiatry, 28*(6), 929-946. <http://dx.doi.org/10.1111/j.1469-7610.1987.tb00680.x>
- Simons, D., & Chabris, C. (1999). Gorillas in our midst: Sustained inattention blindness for dynamic events. *Perception, 28*(9), 1059-1074. <http://dx.doi.org/10.1068/p281059>
- Simons, D., & Chabris, C. (2011). What people believe about how memory works: A representative survey of the u.s. population. *Plos ONE, 6*(8). <http://dx.doi.org/10.1371/journal.pone.0022757>
- Sistrunk, F., & McDavid, J. (1971). Sex variable in conforming behavior. *Journal of Personality and Social Psychology, 17*(2), 200. doi: 10.1037/h0030382.
- Skagerberg, E. & Wright, D. (2008a). The prevalence of co-witnesses and co-witness discussions in real eyewitnesses. *Psychology, Crime & Law, 14*(6), 513-521. <http://dx.doi.org/10.1080/10683160801948980>
- Skagerberg, E. & Wright, D. (2008b). Manipulating power can affect memory conformity. *Applied Cognitive Psychology, 22*(2), 207-216. <http://dx.doi.org/10.1002/acp.1353>

- Skagerberg, E., & Wright, D. (2008c). The co-witness misinformation effect: Memory blends or memory compliance?. *Memory*, 16(4), 436-442.
<http://dx.doi.org/10.1080/09658210802019696>
- Skagerberg, E. & Wright, D. (2009). Susceptibility to postidentification feedback is affected by source credibility. *Applied Cognitive Psychology*, 23(4), 506-523.
<http://dx.doi.org/10.1002/acp.1470>
- Smeets, T., Jelicic, M., & Merckelbach, H. (2006). Stress-induced cortisol responses, sex differences, and false recollections in a DRM paradigm. *Biological Psychology*, 72(2), 164-172. <http://dx.doi.org/10.1016/j.biopsycho.2005.09.004>
- Smith, H. (1966). *Sensitivity to people*. New York: McGraw-Hill.
- Smith, J., Hogg, M., Martin, R., & Terry, D. (2007). Uncertainty and the influence of group norms in the attitude-behaviour relationship. *British Journal of Social Psychology*, 46(4), 769-792.
<http://dx.doi.org/10.1348/014466606x164439>
- Smith, V. & Ellsworth, P. (1987). The social psychology of eyewitness accuracy: Misleading questions and communicator expertise. *Journal of Applied Psychology*, 72(2), 294-300.
<http://dx.doi.org/10.1037/0021-9010.72.2.294>
- Smith, V., Kassin, S., & Ellsworth, P. (1989). Eyewitness accuracy and confidence: Within- versus between-subjects correlations. *Journal of Applied Psychology*, 74(2), 356-359.
<http://dx.doi.org/10.1037/0021-9010.74.2.356>
- Snyder, M. & Monson, T. (1975). Persons, situations, and the control of social behavior. *Journal of Personality and Social Psychology*, 32(4), 637-644. <http://dx.doi.org/10.1037/0022-3514.32.4.637>
- Sorrentino, R. & Yamaguchi, S. (2008). *Handbook of motivation and cognition across cultures* (1st ed.). San Diego: Elsevier.
- Speck, O., Ernst, T., Braun, J., Koch, C., Miller, E., & Chang, L. (2000). Gender differences in the functional organization of the brain for working memory. *Neuroreport*, 11(11), 2581-2585.
<http://dx.doi.org/10.1097/00001756-200008030-00046>
- Stang, D. (1976). Group size effects on conformity. *The Journal of Social Psychology*, 98(2), 175-181. <http://dx.doi.org/10.1080/00224545.1976.9923388>
- Stanny, C. & Johnson, T. (2000). Effects of stress induced by a simulated shooting on recall by police and citizen witnesses. *The American Journal of Psychology*, 113(3), 359.
<http://dx.doi.org/10.2307/1423364>

- Stasser, G., & Davis, J. (1981). Group decision making and social influence: A social interaction sequence model. *Psychological Review*, 88(6), 523-551. doi:10.1037/0033-295x.88.6.523
- Stebly, N. (1992). A meta-analytic review of the weapon focus effect. *Law and Human Behavior*, 16(4), 413-424. <http://dx.doi.org/10.1007/bf02352267>
- Stephenson, G. M. (1990). Should collaborative testimony be permitted in courts of law. *Criminal Law Review*, May, 302-314.
- Stephenson, G., Wagner, W., & Brandstatter, H. (1983). An experimental study of social performance and delay on the testimonial validity of story recall. *European Journal of Social Psychology*, 13(2), 175-191. <http://dx.doi.org/10.1002/ejsp.2420130207>
- Stevens, J. (2009). *Applied multivariate statistics for the social sciences* (1st ed.). New York, NY : Routledge.
- Stimpson, D. & Maughan, M. (1978). Some correlates of trust. *The Journal of Psychology*, 99(1), 103-108. <http://dx.doi.org/10.1080/00223980.1978.9921447>
- Stobbs, G. & Kebbell, M. (2003). Jurors' perception of witnesses with intellectual disabilities and the influence of expert evidence. *Journal of Applied Research In Intellectual Disabilities*, 16(2), 107-114. <http://dx.doi.org/10.1046/j.1468-3148.2003.00151.x>
- Storbeck, J. & Clore, G. (2005). With sadness comes accuracy; with happiness, false memory: mood and the false memory effect. *Psychological Science*, 16(10), 785-791. <http://dx.doi.org/10.1111/j.1467-9280.2005.01615.x>
- Street, C. & Masip, J. (2015). The source of the truth bias: Heuristic processing?. *Scandinavian Journal of Psychology*, 56(3), 254-263. <http://dx.doi.org/10.1111/sjop.12204>
- Suls, J., & Wheeler, L. (2000). *Handbook of social comparison* (1st ed.). New York: Kluwer Academic/Plenum Publishers.
- Svrakic, D. (1993). Differential diagnosis of personality disorders by the seven-factor model of temperament and character. *Archives of General Psychiatry*, 50(12), 991. <http://dx.doi.org/10.1001/archpsyc.1993.01820240075009>
- Švrakić, D., Przybeck, T., & Cloninger, C. (1991). Further contribution to the conceptual validity of the unified biosocial model of personality: US and Yugoslav data. *Comprehensive Psychiatry*, 32(3), 195-209. [http://dx.doi.org/10.1016/0010-440x\(91\)90040-j](http://dx.doi.org/10.1016/0010-440x(91)90040-j)
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics*, 5th. Needham Height, MA: Allyn & Bacon.

- Talbot, M. (2001). The Lives They Lived: 01-07-01: Peggy McMartin Buckey, b. 1926; The devil in the nursery. *The New York Times Magazine*. Retrieved from <http://www.nytimes.com/2001/01/07/magazine/lives-they-lived-01-07-01-peggy-mcmartin-buckey-b-1926-devil-nursery.html>
- Tanford, S., & Penrod, S. (1984). Social Influence Model: A formal integration of research on majority and minority influence processes. *Psychological Bulletin*, 95(2), 189-225. doi:10.1037/0033-2909.95.2.189
- Tellegen, A., & Atkinson, G. (1974). Openness to absorbing and self-altering experiences ("absorption"), a trait related to hypnotic susceptibility. *Journal of Abnormal Psychology*, 83(3), 268-277. <http://dx.doi.org/10.1037/h0036681>
- The American Psychological Association. (2010). *APA Ethical Principles of Psychologists and Code of Conduct*. Washington: APA.
- The British Psychological Society. (2011). *Code of Human Research Ethics*. Leicester: BPS.
- Thompson, E. (2008). Development and validation of an international english Big-Five mini-markers. *Personality and Individual Differences*, 45(6), 542-548. <http://dx.doi.org/10.1016/j.paid.2008.06.013>
- Thorley, C. & Rushton-Woods, J. (2013). Blame conformity: Leading eyewitness statements can influence attributions of blame for an accident. *Applied Cognitive Psychology*, 27(3), 291-296. <http://dx.doi.org/10.1002/acp.2906>
- Thorley, C. (2015). Blame conformity: Innocent bystanders can be blamed for a crime as a result of misinformation from a young, but not elderly, Adult Co-Witness. *PLOS ONE*, 10(7), e0134739. <http://dx.doi.org/10.1371/journal.pone.0134739>
- Thorley, C., & Dewhurst, S. (2007). Collaborative false recall in the DRM procedure: Effects of group size and group pressure. *European Journal of Cognitive Psychology*, 19(6), 867-881. <http://dx.doi.org/10.1080/09541440600872068>
- Thorley, C., & Dewhurst, S. (2009). False and veridical collaborative recognition. *Memory*, 17(1), 17-25. <http://dx.doi.org/10.1080/09658210802484817>
- Tomes, J., & Katz, A. (1997). Habitual susceptibility to misinformation and individual differences in eyewitness memory. *Applied Cognitive Psychology*, 11(3), 233-251. [http://dx.doi.org/10.1002/\(sici\)1099-0720\(199706\)11:3<233::aid-acp447>3.0.co;2-v](http://dx.doi.org/10.1002/(sici)1099-0720(199706)11:3<233::aid-acp447>3.0.co;2-v)

- Touron, D. & Hertzog, C. (2004). Distinguishing age differences in knowledge, strategy use, and confidence during strategic skill acquisition. *Psychology and Aging, 19*(3), 452-466.
<http://dx.doi.org/10.1037/0882-7974.19.3.452>
- Tousignant, J., Hall, D., & Loftus, E. (1986). Discrepancy detection and vulnerability to misleading postevent information. *Memory & Cognition, 14*(4), 329-338.
<http://dx.doi.org/10.3758/bf03202511>
- Traut-Mattausch, E., Guter, S., Zanna, M., Jonas, E., & Frey, D. (2011). When citizens fight back: Justice sensitivity and resistance to political reform. *Social Justice Research, 24*(1), 25-42.
<http://dx.doi.org/10.1007/s11211-011-0125-8>
- Trouve, R. & Libkuman, T. (1992). Eyewitness performance of personality types as a function of induced arousal. *The American Journal of Psychology, 105*(3), 417.
<http://dx.doi.org/10.2307/1423196>
- Tuckey, M. & Brewer, N. (2003). The influence of schemas, stimulus ambiguity, and interview schedule on eyewitness memory over time. *Journal of Experimental Psychology: Applied, 9*(2), 101-118. <http://dx.doi.org/10.1037/1076-898x.9.2.101>
- Tuddenham, R. (1961). The influence of a distorted group norm upon judgments of adults and children. *The Journal of Psychology, 52*(1), 231-239.
<http://dx.doi.org/10.1080/00223980.1961.9916523>
- Tulving, E. (1993). What is episodic memory?. *Current Directions In Psychological Science, 2*(3), 67-70. <http://dx.doi.org/10.1111/1467-8721.ep10770899>
- Tulving, E., & Thomson, D. (1973). Encoding specificity and retrieval processes in episodic memory. *Psychological Review, 80*(5), 352-373. <http://dx.doi.org/10.1037/h0020071>
- UCAS. (2015) (p. 2). Gloucester: UCAS. Retrieved from
<https://www.ucas.com/file/35436/download?token=2Q6wiw-L>
- Underwood, G., & Milton, H. (1993). Collusion after a collision: Witnesses' reports of a road accident with and without discussion. *Applied Cognitive Psychology, 7*(1), 11-22.
<http://dx.doi.org/10.1002/acp.2350070103>
- Valentine, T., Pickering, A., & Darling, S. (2003). Characteristics of eyewitness identification that predict the outcome of real lineups. *Applied Cognitive Psychology, 17*(8), 969-993.
<http://dx.doi.org/10.1002/acp.939>

- Vallano, J., & Compo, N. (2011). A comfortable witness is a good witness: rapport-building and susceptibility to misinformation in an investigative mock-crime interview. *Applied Cognitive Psychology, 25*(6), 960-970. <http://dx.doi.org/10.1002/acp.1789>
- Van Cappellen, P., Corneille, O., Cols, S., & Saroglou, V. (2011). Beyond mere compliance to authoritative figures: religious priming increases conformity to informational influence among submissive people. *International Journal For The Psychology of Religion, 21*(2), 97-105. <http://dx.doi.org/10.1080/10508619.2011.556995>
- Van Swol, L., Braun, M., & Kolb, M. (2015). Deception, detection, demeanor, and truth bias in face-to-face and computer-mediated communication. *Communication Research, 42*(8), 1116-1142. <http://dx.doi.org/10.1177/0093650213485785>
- Vornik, L., Sharman, S., & Garry, M. (2003). The power of the spoken word: Sociolinguistic cues influence the misinformation effect. *Memory, 11*(1), 101-109. <http://dx.doi.org/10.1080/741938170>
- Vrij, A. (2008). Nonverbal dominance versus verbal accuracy in lie detection. *Criminal Justice and Behavior, 35*(10), 1323-1336. <http://dx.doi.org/10.1177/0093854808321530>
- Vrij, A., Pannell, H., & Ost, J. (2005). The influence of social pressure and black clothing on crime judgements. *Psychology, Crime & Law, 11*(3), 265-274. <http://dx.doi.org/10.1080/10683160410001680780>
- Wager, T., Phan, K., Liberzon, I., & Taylor, S. (2003). Valence, gender, and lateralization of functional brain anatomy in emotion: a meta-analysis of findings from neuroimaging. *Neuroimage, 19*(3), 513-531. [http://dx.doi.org/10.1016/s1053-8119\(03\)00078-8](http://dx.doi.org/10.1016/s1053-8119(03)00078-8)
- Walker, E. & Heyns, R. (1962). *An anatomy for conformity* (1st ed.). Englewood Cliffs, N.J.: Prentice-Hall.
- Walker, M. & Andrade, M. (1996). Conformity in the asch task as a function of age. *The Journal of Social Psychology, 136*(3), 367-372. <http://dx.doi.org/10.1080/00224545.1996.9714014>
- Walther, E., Bless, H., Strack, F., Rackstraw, P., Wagner, D., & Werth, L. (2002). Conformity effects in memory as a function of group size, dissenters and uncertainty. *Applied Cognitive Psychology, 16*(7), 793-810. <http://dx.doi.org/10.1002/acp.828>
- Ward, R. & Loftus, E. (1985). Eyewitness performance in different psychological types. *The Journal of General Psychology, 112*(2), 191-200. <http://dx.doi.org/10.1080/00221309.1985.9711003>

- Warnick, D., & Sanders, G. (1980). The effects of group discussion on eyewitness accuracy. *Journal of Applied Social Psychology, 10*(3), 249-259. <http://dx.doi.org/10.1111/j.1559-1816.1980.tb00707.x>
- Waters, N., & Hans, V. (2009). A jury of one: Opinion formation, conformity, and dissent on juries. *Journal of Empirical Legal Studies, 6*(3), 513-540. doi:10.1111/j.1740-1461.2009.01152.x
- Weeks, J., Heimberg, R., Fresco, D., Hart, T., Turk, C., Schneier, F., & Liebowitz, M. (2005). Empirical validation and psychometric evaluation of the brief fear of negative evaluation scale in patients with social anxiety disorder. *Psychological Assessment, 17*(2), 179-190. <http://dx.doi.org/10.1037/1040-3590.17.2.179>
- Wegner, D. M. (1986). Transactive memory. B. Mullen, G. Goethals, eds. *Theories of Group Behavior*.
- Wegner, D., Erber, R., & Raymond, P. (1991). Transactive memory in close relationships. *Journal of Personality and Social Psychology, 61*(6), 923-929. <http://dx.doi.org/10.1037/0022-3514.61.6.923>
- Weinstock, M. & Cronin, M. (2003). The everyday production of knowledge: individual differences in epistemological understanding and juror-reasoning skill. *Applied Cognitive Psychology, 17*(2), 161-181. <http://dx.doi.org/10.1002/acp.860>
- Weldon, M., & Bellinger, K. (1997). Collective memory: Collaborative and individual processes in remembering. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 23*(5), 1160-1175. <http://dx.doi.org/10.1037/0278-7393.23.5.1160>
- Weldon, M., Blair, C., & Huebsch, P. (2000). Group remembering: Does social loafing underlie collaborative inhibition?. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 26*(6), 1568-1577. <http://dx.doi.org/10.1037/0278-7393.26.6.1568>
- Wells, G. (1985). Verbal descriptions of faces from memory: Are they diagnostic of identification accuracy?. *Journal of Applied Psychology, 70*(4), 619-626. <http://dx.doi.org/10.1037//0021-9010.70.4.619>
- Wells, G., & Leippe, M. (1981). How do triers of fact infer the accuracy of eyewitness identifications? Using memory for peripheral detail can be misleading. *Journal of Applied Psychology, 66*(6), 682-687. doi: 10.1037/0021-9010.66.6.682
- Wells, G., Lindsay, R., & Ferguson, T. (1979). Accuracy, confidence, and juror perceptions in eyewitness identification. *Journal of Applied Psychology, 64*(4), 440-448. <http://dx.doi.org/10.1037/0021-9010.64.4.440>

- Wells, G., & Olson, E. (2003). Eyewitness testimony. *Annual Review of Psychology*, 54(1), 277-295. <http://dx.doi.org/10.1146/annurev.psych.54.101601.145028>
- Wilkinson, C. & Hyman, I. (1998). Individual differences related to two types of memory errors: word lists may not generalize to autobiographical memory. *Applied Cognitive Psychology*, 12(7), S29-S46. [http://dx.doi.org/10.1002/\(sici\)1099-0720\(199812\)12:7<s29::aid-acp596>3.0.co;2-r](http://dx.doi.org/10.1002/(sici)1099-0720(199812)12:7<s29::aid-acp596>3.0.co;2-r)
- Willcoxson, L. & Chatham, R. (2006). Testing the accuracy of the IT stereotype: Profiling IT managers' personality and behavioural characteristics. *Information & Management*, 43(6), 697-705. <http://dx.doi.org/10.1016/j.im.2004.04.009>
- Williamson, P., Weber, N., & Robertson, M. (2013). The effect of expertise on memory conformity: A test of informational influence. *Behavioral Sciences & the Law*, 31(5), 607-623. <http://dx.doi.org/10.1002/bsl.2094>
- Winograd, E., Peluso, J., & Glover, T. (1998). Individual differences in susceptibility to memory illusions. *Applied Cognitive Psychology*, 12(7), S5-S27. [http://dx.doi.org/10.1002/\(sici\)1099-0720\(199812\)12:7<s5::aid-acp553>3.0.co;2-d](http://dx.doi.org/10.1002/(sici)1099-0720(199812)12:7<s5::aid-acp553>3.0.co;2-d)
- Witkin, H. & Goodenough, D. (1976). Field dependence and interpersonal behavior. *ETS Research Bulletin Series*, 1976(1), i-78. <http://dx.doi.org/10.1002/j.2333-8504.1976.tb01098.x>
- Wolk, S. & DuCette, J. (1974). Intentional performance and incidental learning as a function of personality and task dimensions. *Journal of Personality and Social Psychology*, 29(1), 90-101. <http://dx.doi.org/10.1037/h0035687>
- Wright, D., Boyd, C., & Tredoux, C. (2003). Inter-racial contact and the own-race bias for face recognition in South Africa and England. *Applied Cognitive Psychology*, 17(3), 365-373. <http://dx.doi.org/10.1002/acp.898>
- Wright, D., Gabbert, F., Memon, A., & London, K. (2008). Changing the criterion for memory conformity in free recall and recognition. *Memory*, 16(2), 137-148. <http://dx.doi.org/10.1080/09658210701836174>
- Wright, D. & Klumpp, A. (2004). Collaborative inhibition is due to the product, not the process, of recalling in groups. *Psychonomic Bulletin & Review*, 11(6), 1080-1083. <http://dx.doi.org/10.3758/bf03196740>
- Wright, D., & Livingston-Raper, D. (2002). Memory distortion and dissociation: exploring the relationship in a non-clinical sample. *Journal of Trauma & Dissociation*, 3(3), 97-109. http://dx.doi.org/10.1300/j229v03n03_06

- Wright, D., & McDaid, A. (1996). Comparing system and estimator variables using data from real line-ups. *Applied Cognitive Psychology, 10*(1), 75-84. [http://dx.doi.org/10.1002/\(sici\)1099-0720\(199602\)10:1<75::aid-acp364>3.3.co;2-5](http://dx.doi.org/10.1002/(sici)1099-0720(199602)10:1<75::aid-acp364>3.3.co;2-5)
- Wright, D. & Skagerberg, E. (2007). Postidentification feedback affects real eyewitnesses. *Psychological Science, 18*(2), 172-178. <http://dx.doi.org/10.1111/j.1467-9280.2007.01868.x>
- Wright, D. & Sladden, B. (2003). An own gender bias and the importance of hair in face recognition. *Acta Psychologica, 114*(1), 101-114. [http://dx.doi.org/10.1016/s0001-6918\(03\)00052-0](http://dx.doi.org/10.1016/s0001-6918(03)00052-0)
- Wright, D. & Stroud, J. (2002). Age differences in lineup identification accuracy: People are better with their own age. *Law and Human Behavior, 26*(6), 641-654. <http://dx.doi.org/10.1023/a:1020981501383>
- Wright, D., & Stroud, J. (1998). Memory quality and misinformation for peripheral and central objects. *Legal and Criminological Psychology, 3*(2), 273-286. <http://dx.doi.org/10.1111/j.2044-8333.1998.tb00366.x>
- Wright, D., London, K., & Waechter, M. (2009). Social anxiety moderates memory conformity in adolescents. *Applied Cognitive Psychology, 24*(7), 1034-1045. <http://dx.doi.org/10.1002/acp.1604>
- Wright, D., Mathews, S., & Skagerberg, E. (2005). Social recognition memory: The effect of other people's responses for previously seen and unseen items. *Journal of Experimental Psychology: Applied, 11*(3), 200-209. <http://dx.doi.org/10.1037/1076-898x.11.3.200>
- Wright, D., Memon, A., Skagerberg, E., & Gabbert, F. (2009). When eyewitnesses talk. *Current Directions In Psychological Science, 18*(3), 174-178. <http://dx.doi.org/10.1111/j.1467-8721.2009.01631.x>
- Wright, D., Self, G., & Justice, C. (2000). Memory conformity: Exploring misinformation effects when presented by another person. *British Journal of Psychology, 91*(2), 189-202. <http://dx.doi.org/10.1348/000712600161781>
- Wyer, R. (1966). Effects of incentive to perform well, group attraction, and group acceptance on conformity in a judgmental task. *Journal of Personality and Social Psychology, 4*(1), 21-26. <http://dx.doi.org/10.1037/h0023516>
- Wyer, R. (1966). Effects of incentive to perform well, group attraction, and group acceptance on conformity in a judgmental task. *Journal of Personality and Social Psychology, 4*(1), 21-26. <http://dx.doi.org/10.1037/h0023516>

- Yarmey, A. & Jones, H. (1983). Accuracy of memory of male and female eyewitnesses to a criminal assault and rape. *Bulletin of The Psychonomic Society*, 21(2), 89-92.
<http://dx.doi.org/10.3758/bf03329962>
- Yarmey, A. (1993). Adult age and gender differences in eyewitness recall in field settings. *Journal of Applied Social Psychology*, 23(23), 1921-1932. <http://dx.doi.org/10.1111/j.1559-1816.1993.tb01073.x>
- Yarmey, A. (2004). Eyewitness recall and photo identification: A field experiment. *Psychology, Crime & Law*, 10(1), 53-68. <http://dx.doi.org/10.1080/1068316021000058379>
- Yarmey, A., & Morris, S. (1998). The effects of discussion on eyewitness memory. *Journal of Applied Social Psychology*, 28(17), 1637-1648. <http://dx.doi.org/10.1111/j.1559-1816.1998.tb01693.x>
- Yonelinas, A. (2002). The nature of recollection and familiarity: A review of 30 years of research. *Journal of Memory and Language*, 46(3), 441-517.
<http://dx.doi.org/10.1006/jmla.2002.2864>
- Young, K., Powell, M., & Dudgeon, P. (2003). Individual differences in children's suggestibility: a comparison between intellectually disabled and mainstream samples. *Personality and Individual Differences*, 35(1), 31-49. [http://dx.doi.org/10.1016/s0191-8869\(02\)00138-1](http://dx.doi.org/10.1016/s0191-8869(02)00138-1)
- Young, P. (2000). 'I Might as Well Give Up': Self-esteem and mature students' feelings about feedback on assignments. *Journal of Further and Higher Education*, 24(3), 409-418.
<http://dx.doi.org/10.1080/030987700750022325>
- Yuille, J. & Cutshall, J. (1986). A case study of eyewitness memory of a crime. *Journal of Applied Psychology*, 71(2), 291-301. <http://dx.doi.org/10.1037/0021-9>
- Zajac, R., & Henderson, N. (2009). Don't it make my brown eyes blue: Co-witness misinformation about a target's appearance can impair target-absent line-up performance. *Memory*, 17(3), 266-278. <http://dx.doi.org/10.1080/09658210802623950>
- Zaragoza, M. S., Dahlgren, D., & Muench, J. (1992). The role of memory impairment in children's suggestibility. In Howe, M. L., Brainerd, C. J., & Reyna, V. F. (1992). *Development of long-term retention* (pp. 184-216). Springer New York.
- Zaragoza, M., & Lane, S. (1994). Source misattributions and the suggestibility of eyewitness memory. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 20(4), 934-945. <http://dx.doi.org/10.1037/0278-7393.20.4.934>

- Zaragoza, M., McCloskey, M., & Jamis, M. (1987). Misleading postevent information and recall of the original event: Further evidence against the memory impairment hypothesis. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 13(1), 36-44.
<http://dx.doi.org/10.1037/0278-7393.13.1.36>
- Zaragoza, M., Payment, K., Ackil, J., Drivdahl, S., & Beck, M. (2001). Interviewing witnesses: Forced confabulation and confirmatory feedback increase false memories. *Psychological Science*, 12(6), 473-477. <http://dx.doi.org/10.1111/1467-9280.00388>
- Zarnoth, P. & Sniezek, J. (1997). The social influence of confidence in group decision making. *Journal of Experimental Social Psychology*, 33(4), 345-366.
<http://dx.doi.org/10.1006/jesp.1997.1326>
- Zelinski, E., Gilewski, M., & Schaie, K. (1993). Individual differences in cross-sectional and 3-year longitudinal memory performance across the adult life span. *Psychology and Aging*, 8(2), 176-186. <http://dx.doi.org/10.1037/0882-7974.8.2.176>
- Zhang, L. (2002). Measuring thinking styles in addition to measuring personality traits?. *Personality and Individual Differences*, 33(3), 445-458.
[http://dx.doi.org/10.1016/s0191-8869\(01\)00166-0](http://dx.doi.org/10.1016/s0191-8869(01)00166-0)
- Zhu, B., Chen, C., Loftus, E., Lin, C., He, Q., & Chen, C. (2010). Individual differences in false memory from misinformation: Cognitive factors. *Memory*, 18(5), 543-555.
<http://dx.doi.org/10.1080/09658211.2010.487051>
- Zipf, S. (1960). Resistance and conformity under reward and punishment. *The Journal of Abnormal and Social Psychology*, 61(1), 102-109. doi:10.1037/h0045331
- Zobel, H. B. (1970). *The Boston Massacre*. New York: Norton.
- Zoellner, L., Foa, E., Brigidi, B., & Przeworski, A. (2000). Are trauma victims susceptible to "false memories?". *Journal of Abnormal Psychology*, 109(3), 517-524.
<http://dx.doi.org/10.1037//0021-843x.109.3.517>

Appendices

Appendix 1. Pre-experiment instruction sheets.

A. True participant sheet

Instruction Sheet

Thank you for agreeing to participate within the present study. Before starting the experiment, it is worth familiarising yourself with some background information relating to the research you are involved in.

The researcher:

The key researcher for this study is Dara Mojtahedi, a PhD student at the University of Huddersfield.

The PhD project, of which you are participating in, has also been supervised by Dr Maria Ioannou and Dr Laura Hammond- members of staff at the University of Huddersfield.

The current study:

The current research is interested in identifying how individuals react when encountering violent behaviour. This means that the footage you will be viewing will contain some scenes of fighting that many would consider to be violent. You are asked to watch the footage and later, partake in some discussion activities in relation to your views on the event. Please refrain from talking to any other participants, unless instructed to do so by the experimenter.

Thank you,

Dara Mojtahedi

PhD Researcher

B. Confederate sheet

Instruction Sheet

Thank you for agreeing to participate within the present study.

You have been randomly selected to play the role of a confederate within this study.

This means that you will be asked to purposely produce specific responses during the experiment. The aim of the study is to determine whether eyewitnesses can be influenced by their co-witnesses, when attempting to attribute blame.

Shortly, you will be asked to watch a footage of a bar fight breaking out. The footage will show a man in a dark green t-shirt starting a fight with a man in a yellow t-shirt by attacking him first.

Once you have watched the video footage I will be asking your group to discuss amongst each other what happened. Your job is to purposely suggest that the man in the yellow top had started the fight by confronting the other man and throwing the first hit. You must not let on to the others that you are a confederate.

You can provide your misleading suggestion at any time during the discussion (present the misinformation when you deem most appropriate).

You can either present it before the other participants have spoken by saying the following sentence: *'I remember seeing the man in the yellow top throw the first hit.'*

You can present your misinformation after a participant has given the correct response by saying *'No, I remember the man in the yellow top throwing the first hit.'*

You can also present the misinformation after another participant has provided a similarly misleading response by saying *'Yes, I agree. I also remember seeing the man in the yellow top throwing the first hit.'*

Please do not add any additional arguments or information to the discussion. If another participant questions your input, you can respond by saying *'well, that's what I remember seeing from the video'*. There may other confederates within the same group as you. You are permitted to slightly alter the wording of the responses provided above, to prevent your response from sounding too similar to another participant/confederate's. You are instructed to provide all of your statements in a confident manner, but you are advised not to be assertive or to try to be purposefully persuasive.

Before starting the experiment, it is worth familiarising yourself with some background information relating to the research you are involved in.

Thank you,

Dara Mojtahedi

PhD Researcher.

Appendix 2. Information sheet, consent form and debrief sheet.

A. Information sheet.

INVESTIGATING THE EFFECTS OF CO-WITNESS INFLUENCE ON BLAME
ATTRIBUTION

INFORMATION SHEET

You are being invited to take part in this experiment. Before you decide to take part it is important that you understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with the experimenter if you wish. Please do not hesitate to ask if there is anything that is not clear or if you would like more information.

What is the study about?

The purpose of this study is to produce an accurate simulation of witnessing a crime and to observe to identify the attitudes of individuals on watching violence.

Why I have been approached?

You have been asked to participate because the study requires a copious amount of well minded individuals to watch the footage to allow us to understand how individuals react to witnessing a crime.

Do I have to take part?

No, participation is completely voluntary, you can refuse to participate at any time. If you do choose to take part, you will be asked to fill in a consent form after being informed of what the study consists of. You can withdraw from the study at anytime without any reason and it will not affect you.

What will I need to do?

If you were to take part in the experiment this is what the study would consist of :

1) You will be asked to watch a short video.

2A) After viewing the video, you will be given the opportunity to discuss the footage with the other participants.

2B) After watching the footage, you are not allowed to discuss the footage with the other participants.

3) You will then be asked a series of questions about your views of the footage.

4) You will then be debriefed and any questions you have will be answered.

(NB: the use of A/B indicates alternative instructions participants will be given depending on which condition they will be in.)

Will my identity be disclosed?

All information will be highly confidential and not disclosed to anyone outside the research team, unless you disclose any information that puts yourself or others at risk. Through out the research you will be referred to by your allocated number and not your name, making your data untraceable to you.

What will happen to the information?

All information will be stored electronically onto one computer and also on one pen drive, both of which will be password protected. As mentioned before, the data will not include your name or any other details that can make you identifiable, granting total anonymity.

Who can I contact for further information?

If you require any further information about the research, please contact me on:

Researcher: Dara Mojtahedi

Email: dara.mojtahedi@hud.ac.uk

Mobile: +44 (0) 7932475715

Supervisor: Dr Maria Ioannou

Email: m.ioannou@hud.ac.uk

Mobile: +44 (0) 779 612 3044

Supervisor: Dr Laura Hammond

Email: I.hammond@hud.ac.uk

Telephone: +44 (0) 1484 471460

B. Consent form

CONSENT FORM

INVESTIGATING THE EFFECTS OF CO-WITNESS INFLUENCE ON BLAME ATTRIBUTION

It is important to read and fully understand the consent form before signing it. Please be aware that your participation in this experiment is totally voluntary and by signing the declaration, you are agreeing with the following statements.

I have been fully informed of the nature and aims of this research

I consent to taking part in the experiment.

I understand that I have the right to withdraw from the research at any time
Without giving any reason

I give permission for my answers to be quoted, through the use of a pseudonym

I understand that the information collected will be kept in secure conditions
at the University of Huddersfield for a maximum of up to 10 years

I understand that only the researchers will have access to my data.

I understand that my identity will be anonymous throughout the study and that no
Information that can be used to identify me will be used.

I understand that I can have my data withdrawn and erased from the research at any
time without the need to give a reason

If you agree with the above statements please tick the boxes to indicate that you give consent to that which is mentioned. If you agree to take part in the experiment please sign the information below:

Signature of Participant: _____ Print: _____ Date: _____	Signature of Researcher: _____ Print: _____ Date: _____
---	--

C. Debrief sheet

Debrief Sheet

Thank you for your participation in the study, please be aware if you choose to want to withdraw your data from the study at any time please email us on one of the addresses listed below to do so.

The following sheet will explain the whole study to you thoroughly.

Aims of the experiment:

The study is aiming to identify if eyewitnesses are at risk of conforming to each other's statements if they are allowed to discuss the footage amongst each other before giving statements.

The study was made up of 2 main groups. The control group was the group which showed participants the footage and then asked them to carry out the identification parade without discussing the footage.

The control group involved the participants discussing the footage before carrying out the identification parade. However if you were in this group, the other four group members were not actual participants but confederates that were planted in your group to purposely claim that a different individual committed the crime. The study proposed that if the participants in this group gave a false answer as well it would have been due to conforming to the confederates.

The footage:

The footage that you will have watched was a mock scenario that was recorded in a Vox Bar, Huddersfield. All the individuals in the footage were volunteers and nobody was hurt in the making of the footage.

The Questionnaire:

The Questionnaire that you filled out before watching the footage is called the Fundamental interpersonal relations orientation (FIRO) questionnaire. The questionnaire was used so that the participant's scores on it could be compared with their answers on the identifications parade to establish if the questionnaire could predict whether certain individuals were more likely to conform to confederates than others.

Further Questions:

Should you have any further questions or if any aspect of the experiment has effected you in anyway, please contact me through my details below for more information.

Dara.mojtahedi@hud.ac.uk

+44 (0) 7932475715

Thank you for your time,

Dara Mojtahedi

Appendix 3. Evidence of SREP approval

Dear Dara,

Prof Rachel Armitage, SREP Chair, has confirmed that you have addressed the issues raised to her satisfaction and full ethical approval has now been granted.

With best wishes for the success of your research project.

Regards,

Kirsty
(on behalf of Prof Rachel Armitage, SREP Chair)

Kirsty Thomson
Research Administrator

☎: 01484 471156
✉: K.Thomson@hud.ac.uk
🌐: www.hud.ac.uk

Appendix 4. Interview script

Experimenter Questions

During the event that you just witnessed, where you able to identify which person had thrown the first hit? If so, could you please identify which person it was based on a description of their clothing? If you are unsure as to who had started the fight, you can state that you are 'unsure'. Please try to refrain from guessing and only provide a response based on what you remember seeing yourself.

Answer: _____

Could you also please state how confident you are in your response on a scale of one to five, with one meaning very little confidence and five meaning a very high level of confidence. (do not ask for confidence rating from those who answer 'unsure').

Confidence rating: 1
 2
 3
 4
 5

Appendix 5. Fundamental Interpersonal Relations Orientation-Behaviour (FIRO-B) Scale

Below is a list of some different ways of behaving towards others that you may have.

Read each statement put a X in one of the 6 boxes to show how much you agree that the statement is *true*.

The more you agree it is true, the nearer your X should be to the AGREE side.

1. I seek out people to be with.	DISAGREE							AGREE
2. People decide what to do when we are together.	DISAGREE							AGREE
3. I am totally honest with my close friends.	DISAGREE							AGREE
4. People invite me to do things.	DISAGREE							AGREE
5. I am the dominant person when I am with people.	DISAGREE							AGREE
6. My close friends tell me their real feelings.	DISAGREE							AGREE

7. I join social groups.	DISAGREE							AGREE
8. People strongly influence my actions.	DISAGREE							AGREE
9. I confide in my close friends.	DISAGREE							AGREE
10. People invite me to join their activities.	DISAGREE							AGREE
11. I get other people to do things I want done.	DISAGREE							AGREE
12. My close friends tell me about private matters.	DISAGREE							AGREE
13. I join social organisations.	DISAGREE							AGREE
14. People control my actions.	DISAGREE							AGREE
15. I am more comfortable when people do not get too close.	DISAGREE							AGREE
16. People include me in their activities.	DISAGREE							AGREE
17. I strongly influence other people's actions.	DISAGREE							AGREE
18. My close friends do not tell me about themselves.	DISAGREE							AGREE
19. I am included in informal social activities.	DISAGREE							AGREE
20. I am easily led by people.	DISAGREE							AGREE
21. People should keep their private feelings to themselves.	DISAGREE							AGREE
22. People invite me to participate in their activities.	DISAGREE							AGREE
23. I take charge when I am with people socially.	DISAGREE							AGREE
24. My close friends let me know their real feelings.	DISAGREE							AGREE
25. I include other people in my plans.	DISAGREE							AGREE
26. People decide things for me.	DISAGREE							AGREE
27. There are some things I do not tell anyone.	DISAGREE							AGREE

28. People include me in their social affairs.	DISAGREE								AGREE
29. I get people to do things the way I want them done.	DISAGREE								AGREE
30. My closest friends keep secrets from me.	DISAGREE								AGREE
31. I have people around me.	DISAGREE								AGREE
32. People strongly influence my ideas.	DISAGREE								AGREE
33. There are some things I would not tell anyone.	DISAGREE								AGREE
34. People ask me to participate in their discussions.	DISAGREE								AGREE
35. I take charge when I am with people.	DISAGREE								AGREE
36. My friends confide in me.	DISAGREE								AGREE
37. When people are doing things together I join them.	DISAGREE								AGREE
38. I am strongly influenced by what people say.	DISAGREE								AGREE
39. I have at least one friend to whom I can tell anything.	DISAGREE								AGREE
40. People invite me to parties.	DISAGREE								AGREE
41. I strongly influence other people`s ideas.	DISAGREE								AGREE
42. My close friends keep their feelings a secret from me.	DISAGREE								AGREE
43. I look for people to be with.	DISAGREE								AGREE
44. Other people take charge when we work together.	DISAGREE								AGREE
45. There is a part of myself I keep private.	DISAGREE								AGREE
46. People invite me to join them when we have free time.	DISAGREE								AGREE
47. I take charge when I work with people.	DISAGREE								AGREE
48. At least two of my friends tell me their true feelings.	DISAGREE								AGREE

49. I participate in group activities.	DISAGREE							AGREE
50. People often cause me to change my mind.	DISAGREE							AGREE
51. I have close relationships with a few people.	DISAGREE							AGREE
52. People invite me to do things with them.	DISAGREE							AGREE
53. I see to it that people do things the way I want them to.	DISAGREE							AGREE
54. My friends tell me about their private lives.	DISAGREE							AGREE

