Persuasion in Context: Understanding the Impact of Communication Modality, Gender, Ethnicity, Cognitive, and Linguistic Style Volume One Claire L.

Tranter, C.L.

Persuasion in Context: Understanding the Impact of

Communication Modality, Gender, Ethnicity, Cognitive,

and Linguistic Style

Volume One

Claire L. Tranter

A thesis submitted in partial fulfilment of the

requirements of the University of Westminster

for the degree of Doctor of Philosophy

June, 2019

Abstract

Information is increasingly being exchanged on a global stage, and so audiences are becoming more diverse through communication in varying digital modalities. Understanding persuasion is increasingly important, particularly in response to technological change regarding the way in which we communicate and increased usage in our daily lives. However, persuasion has yet to be fully explored in relation to gender, ethnicity, cognitive and linguistic style and their influence on decision-making in interactive, synthetic modalities. This thesis sought to address this gap by employing an interpersonal modernised persuasion paradigm across three distinct contexts. Accordingly, three experimental studies are presented: Study 1 is conducted face-to-face (FtF), Study 2 utilises anonymous instant messaging software, and Study 3 introduces a novel, immersive, and collaborative virtual reality environment, which enables communication to occur in real-time via embodiment of avatars. The aims of the thesis were to a), investigate the effect of communication modalities on persuasion outcomes, b) to explore whether cognitive biases mediate persuasion outcomes, c) whether gender and ethnicity influence dyadic persuasive interactions, and d), to understand the impact, or otherwise, of linguistic style - comprising of quantitative analysis including linguistic synchronicity and epistemic modality, on persuasion outcomes. The combined results highlighted how the virtual environment was akin to the FtF modality, showing a propensity for successful persuasive outcomes and increased metacognitive confidence in attitude change. This has ramifications for real-world effects when researchers utilise virtual technology to observe, measure and train real-world performances. The anonymous instant messaging platform led to enhanced resistance across gender and ethnic groups, with males being significantly more likely to oppose the persuasive arguments as a result. Overall however, ethnicity and gender did not influence persuasion outcomes, nor did cognitive style mediate or predict an individual's disposition to persuasion. Finally, linguistic style highlighted differences

across participants, with persuaded individuals using more cognitive processing and informal language during exchanges. Expanding our understanding of how judgements are formed, influenced and modified can serve to widen discussion, and support applied understandings regarding the management of conversations both on- and offline. All findings are presented and discussed in relation to the relevant theoretical literature throughout this body of work.

List of Contents

List of Figures

List of Tables

List of Publications and Presentations

Peer-reviewed Publication

Dando, C. J. & Tranter, C. (2015). Intelligence interviewing: Synthetic

environments, cognition and cognitive style. *Investigative Interviewing:*

Research and Practice (II-RP Special Issue), 7(2), 42-50.

Peer-reviewed Book Chapter:

Dando, C. J. & Tranter, C. (2016). Military and defence applications. In A. Attrill, & C.

Fullwood (Eds.) *Applied cyberpsychology: Practical applications of*

cyberpsychological theory and research (pp. 197-215). London: Palgrave

Macmillan.

Conference Submission: Oral Presentation

Tranter, C., & Dando, C. (July, 2017). *Cognition in Context: Investigating the impact of*

cognitive style on persuasion using synthetic realities. Presented at the 10th iIIRG

Annual Conference and Masterclass, Monterey, California.

Tranter, C., & Dando, C. (September 2016). *The 5-minute thesis*. Presented at the Dstl &

Ministry of Defence Doctoral Symposium: Understanding and Enhancing

Cognition and Performance, Oxford, UK.

Tranter, C. (May, 2016). *Cognition in Context: Investigating the impact of*

cognitive style and gender on persuasion in face-to-face and synthetic

environments. Paper presented at CiC Research Conference, Wolverhampton UK.

Tranter, C. (September, 2015). *Understanding how context influences*

 persuasion across cognitive divides. Paper presented at SNIC Research Conference,

Wolverhampton UK.

Tranter, C., Dando, C., Fullwood, C., & Chadwick, D. (April, 2015). *Intelligence*

gathering and persuasion in differing contexts: Preliminary findings. Paper

presented at CRUW CyberPsychology Research Conference, Wolverhampton UK.

Tranter, C., & Dando, C. (June, 2014). *Cognition in Context: Investigating the impact of individual differences on information-gathering interviews in synthetic environments.* Paper presented at the 7th iIIRG Annual Conference and Masterclass 2014, Lausanne Switzerland.

Tranter, C., Dando, C., Fullwood, C., & Chadwick, D. (May, 2014). *Synthetic environments and how they can be used to persuade individuals to impart information for investigative-gathering purposes.* Paper presented at CRUW CyberPsychology Research Conference, Wolverhampton UK.

<u>Conference Submission: Posters</u>

Tranter, C., Dando, C. J., Chadwick, D., & Fullwood, C. (May, 2016). *Understanding Persuasion Across Cognitive and Contextual Divides.* Poster session presented at the 28th APS International Conference, Chicago, Illinois.

Tranter, C., Dando, C. J., Chadwick, D., & Fullwood, C. (September, 2015). *Persuasion and Cognitive Style.* Poster session presented at BPS West Midlands Annual Conference, Coventry, UK.

Tranter, C., Dando, C. J., Chadwick, D., & Fullwood, C. (May, 2015). *Persuasion and Cognitive Style.* Poster session presented at BPS Annual Conference, Liverpool, UK.

List of Abbreviations

BADE	Bias against disconfirmatory evidence
CMC	Computer-mediated communication
DM	Digital modality
ELM	Elaboration-likelihood model
EOWPVT-4	Expressive One-Word Picture Vocabulary Test – 4th edition
HMD	Head-mounted display
HSM	Heuristic-systematic model
IM	Instant messaging
Ind/Col	Individualist/Collectivist
JM	Jury Method
JTC	Jumping to conclusions bias
LIWC	Linguistic Inquiry and Word Count
LSM	Linguistic Style Matching
MRT	Media Richness Theory
NfCC	Need for Cognitive Closure
PDI-R	Peters' Delusional Inventory revised
PQ	Presence Questionnaire
QCA	Qualitative content analysis
SSQ	Simulator Sickness Questionnaire
UN	United Nations
VE	Virtual environment
VR	Virtual reality
VRE	Virtual reality environment
WC	Word count

you saw I was struggling, a shoulder to cry on when life got tough, but most of all you 'understand' this journey and I am glad I got to share mine with you. You never fail to make me laugh until my sides hurt, fill my belly until it is fit to bursting, and provide great company on our trip adventures when the PhD writing needed a well-deserved break!

Finally, but by no means least, I wish to thank my Mum, Dad, and loving family (which of course includes my rescue dog Lola), for their unwavering support throughout this long, sometimes painful, but nevertheless rewarding journey.

Author's Declaration

I hereby declare that I am the sole author of this thesis carried out in accordance with the Regulations of the University of Westminster. The work is fully original except where indicated by special reference in the text and no part of this thesis has been submitted for any other degree. The thesis has not been presented to any other University for examination either in the United Kingdom or overseas.

Chapter One: Persuasion and Language

1.1 Overview of Thesis

Persuasion is used for many professional and non-professional social exchanges and is considered a ubiquitous part of daily life. For example, it is often the foundation of political and diplomatic relations and decisions across the globe. Yet much of the literature focuses on unilateral face-to-face persuasion, often manipulating single processes such as credibility of sources and messages to investigate persuasion outcomes. Furthermore, the digital online space is changing the way in which we access information, interact with others, and form opinions towards current and political events. The expansion of online influence means that persuasive messages and content can reach larger, more diverse audiences in an increasingly rapid and interactive manner. As such, it is important to understand the theoretical accounts of social cognition and the role that digital modalities (DMs) have on persuasion.

It is the aim of this thesis to investigate individual differences in persuadability across varying DMs, that have to date, received limited attention. This includes four distinct variables which will be measured and manipulated to gain an understanding of persuadability influences: these include gender, ethnicity, cognitive, and linguistic style. Each area will in turn, be described, critiqued, and expanded upon in subsequent chapters, with the current research studies focusing on a bilateral and interactive persuasive exchange, facilitating the observation of naturalistic persuadability and influence throughout this body of work.

1.2 Overview of Chapter

This first chapter will define persuasion and introduce the dominant dual process theories of persuasion of relevance to this thesis. The second half of this first chapter will

focus on the language of persuasion, with a particular focus on linguistic style and the effect of confidence on persuasion outcomes.

1.3 Defining Persuasion

The study of persuasion and attitude change has been a central focus of social psychology for many years (Allport, 1935; Ross, 1908). Persuasion and attitude change occur almost daily, and this type of cognition is important for a number of key issues such as education, the criminal justice system, political debate and economics. For example, politicians typically need to persuade voters and the public that their policies are just, honest and stand up to scrutiny. Health care providers and the relevant government public health organisations are often tasked with persuading people to change deep-seated and often enjoyable behaviours, such as smoking and eating sugary foods in order to remain healthy and live longer (e.g., Shen, Sheer, & Li, 2015). Similarly, prosecutors and defence barristers attempt to persuade juries of the guilt or innocence of a defendant, and jury members have to persuade each other to agree a majority verdict (see Leippe, 2016; Mauet, 2017).

Defining persuasion is challenging, with many definitions employed throughout the literature. For example, persuasion has been described as a "symbolic activity… effecting the internalisation or voluntary acceptance of new cognitive states or patterns of overt behaviour through the exchange of messages" (Smith, 1982, p.7). On the other hand, Andersen (1971) defines persuasion as a communication process, whereby "the communicator seeks to elicit a desired response from the receiver" (p.6). Alternatively, Perloff (2003) claims the main component of persuasion is the symbolic process, whereby a communicator actively attempts to convince another to change their attitude towards a specific issue, in contexts where that individual has free will, and so need not comply. The term *persuadability* is also often used in the literature. Persuadability generally refers to an individual's responsiveness to communication stimuli and is measured using persuasion

outcomes when all other communication stimuli are held constant (Cervin, Joyner, Spence, & Heinzl Jr., 1961). Thus, persuasion is the process of information change, whereas persuadability is an individual's responsiveness to persuasive communication.

Despite different definitions of persuasion, there is considerable consensus that persuasion is the communication process, which has the potential to change a response, attitude or belief. Fundamental to this process is i) the formation of a new judgment in the persuadee (the receiver of the message) in response to the advocacy of a persuader (the sender of the message), ii) that the persuasive message communicated is intended to change an attitude, related behaviour, belief or decision in the receiver, and iii) the receiver has free choice, and is actively processing the information. Persuasion is also considered an interactive communicative process (Dainton, 2005), which is social in nature with individuals often looking to others for advice and elaboration before a final decision and attitude is formed. For the purposes of this thesis, persuasion and attitude change are used interchangeably, and it is Perloff's (2003) definition of persuasion that underpins the programme of research presented this thesis. From here on, persuasion is used to describe the process of convincing another to change his/her mind in conditions of free will.

1.4   Models of Persuasion

The prevalent models of persuasion are the Heuristic Systematic Model (Chaiken, 1987; Chaiken, Liberman, & Eagly, 1989) and Elaboration Likelihood Model (Petty, Cacioppo, & Goldman, 1981; Petty & Cacioppo, 1986), and it is these models that underpin the research presented in this thesis. Both models propose two alternative cognitive pathways for processing a persuasive message, and the information contained within the message. Both argue that persuasion can arise either as a result of effortful and deliberate processing, or as a result of automatic heuristic forms of processing. However, there are some differences and so each are now introduced.

1.4.1 The heuristic-systematic model. The Heuristic-Systematic Model (HSM; Chaiken, 1987; Chaiken, Liberman, & Eagly, 1989) diverges from previous information-processing theories which focus on 'variable-orientated' approaches such as the source or message, to instead embrace a 'process-orientated' approach (Booth-Butterfield & Welbourne, 2002). It suggests that attitudes can change in two fundamentally different ways and outlines two distinct processes involved in the processing of the persuasive message, namely *systematic* and *heuristic.* Systematic processing is seen as the more analytical and comprehensive pathway for assessing the validity of the information relevant to the judgement being made. It is argued that systematic processing requires cognitive ability and capacity, and so systematic processing is less likely in individuals who pose little knowledge of the subject/domain, or who have little time available to consider the persuasive message, for example. Individuals who process persuasive information systematically are thought to be able to differentiate between strong and weak message arguments, evaluating the advocated position in relation to previous knowledge (Chaiken, 1980; Chaiken & Maheswaran, 1994).

Heuristic processing, on the other hand, is believed to require minimal cognitive effort. Here, individuals focus upon a subset of informational cues available to them, using simple inferential decision rules, schemata and cognitive heuristics to base subsequent decisions on. This more superficial assessment of persuasion cues and the persuasion message can include surface or structural characteristics of the message itself (e.g., number or length of arguments) or even communicator characteristics (such as likability, expertise etc.). Thus, individuals are more likely to endorse and accept information without fully processing the sematic content of the arguments, instead relying on easy-to-access peripheral content information, such as the likability of the source for example (Chaiken, 1980; Roskos-Ewoldsen & Fazio, 1992).

The heuristic route is thought to rely on knowledge structures, learned and stored in memory from past experiences and observations (Nisbett & Ross, 1980). Three aspects of heuristic structures are believed to be key which include *availability* for future use (Tulving & Pearlstone, 1966), and *accessibility* of how easily/quickly a knowledge structure can be activated and made accessible for retrieval in memory (Sedikides & Skowronski, 1991). Heuristics are highly salient and are more accessible, meaning they are more likely to be used and available when forming individual judgements. Finally, *applicability* is important when discussing the heuristic route, referring to the appropriateness of the knowledge schemata to the task at hand, whereby a higher relevance for the accessible knowledge and stimulus leads to a stronger effect on the end judgement (Higgins, 1996). One early example of applicability and accessibility can be seen in Chaiken, Axsom, Liberman, and Wilson (1992) where the heuristic "message length implies message strength" was used. Individuals who perceived this cue as being reliable used the cue in assessing the task. However, priming concerning message length did not affect individuals who did not believe this to be a reliable cue in the first instance – indicating that applicability constrains accessibility in heuristic information processing.

While HSM posits two distinct modes of processing, the model also assumes that these two processing modes can interact simultaneously. There are three hypotheses regarding the interaction relationship of the two routes. The first is known as the *additivity hypothesis* whereby when processing modes are congruent, this will result in additive effects on a receiver's persuasion outcome (Chaiken & Maheswaran, 1994). In other words, when judgmental implications of message factors and heuristics are consistent, they can exert significant and additive effects on attitudes. Secondly, the *attenuation hypothesis* (Chaiken & Eagly, 1989) states that when heuristic and systematic processing are conflicting, implications derived from the systematic route will attenuate the impact of the heuristic route. Therefore, if attitudes are incongruent, systematic processing will override the impact of heuristic processing on attitude change.

Finally, the *bias hypothesis* (Bohner, Chaiken & Hunyadi, 1994) occurs when an ambiguous persuasive message stimulates heuristic cues, and these cues bias possible systematic processing despite high motivation from the receiver. For example, the contents of an ambiguous message may become more convincing when presented by an expert compared to a layperson (Chaiken & Maheswaran, 1994). The same ambiguous message however, can be interpreted differently depending on whether a person deems the message source reliable or not. Here, participants high or low in motivation were influenced by the 'reliable' source. The authors showed that those high in motivation used systematic processing but were biased by the credibility of the source. Those low in motivation processed the message heuristically, biased by source reliability. Often such effects are implicit, with individual's being unaware of the biasing influences, and instead believing their perceptions are based on systematic processing and reliable reading of reality (Trope & Gaunt, 1999). The bias hypothesis has received considerable support and indicates that biased processing can be independent of motivation (Chung & Waheed, 2016).

HSM suggests therefore, that the likelihood of an individual engaging in in-depth cognitive processing relies on the sufficiency principle (Chaiken et al, 1989; Chaiken, Giner-Sorolla, & Chen, 1996). It is thought that systematic processing will increase when the difference between an individuals' desired and actual confidence levels is large. Similarly, the principle also argues that individuals are likely to engage in heuristic processing when their desired and actual confidence levels are analogous (i.e., the difference in confidence is low). Individual desired confidence acts as the sufficiency threshold, triggering systematic processing of information when actual confidence is lower than desired by this threshold. This desire to reduce the discrepancy in confidence conceptualises the motivation to engage in information processing (Jonas, Diehl, & Bromer, 1997). Thus, enhancing cognitive processing can be stimulated by increasing an individual's desired confidence, or reducing the individual's actual confidence, or indeed both. This can be seen in Maheswaran and Chaiken's (1991) study, whereby consensus

information was either congruent or incongruent to the valence of a persuasion message. They found in the incongruent condition, those that were not highly motivated showed substantial systematic processing due to the incongruent condition undermining their actual confidence (see Festinger, 1957).

Cognitive, personal and environmental influences also affect an individual's ability and motivation to process messages (Cialdini, 1984; Haddock, Maio, Arnold, & Huskinson, 2008). The cognitive miser (Fiske & Taylor, 1991) comes from the principle of least effort, whereby individuals invest cognitive effort only when given sufficient motivation and cognitive resources. This is not due to laziness, but through economically-minded processers which enable expenditure of resources where they are needed, in an efficient manner (Bohner, Moskowitz, & Chaiken, 1995). Regarding motivation within the HSM, Chaiken (1987) initially claimed there was one dominant and core motivation that underpinned the processes of information: accuracy. The HSM claims people strive to achieve accurate attitudes and judgements, relevant and consistent with reality. This can be achieved via systematic processing, heuristic processing or both. Despite the assumption that heuristic processing often leads to less accurate judgements, this route is grounded in experience and can (under certain situations) be an accurate measure of judgement and attitude choice (Dillard & Pfau, 2002).

The HSM has undergone modifications, extending into a multiple-motive model which comprises two additional underlying motivations other than accuracy: defence-motivation and impression-management motivation (Chaiken et al., 1996). Defence-motivation is triggered when individuals try to defend pre-existing attitudinal positions. The goal being to confirm the validity of their positions and disconfirm other potential attitudes/opinions (Chaiken et al, 1989). Again, this can be processed either via the systematic route, heuristic route or both. The motivational processing employed is conditional on the sufficiency principle. When cues are incongruent to the preferred position, this will reduce an individual's actual confidence and thus enhance the

discrepancy between actual and desired confidence, leading to that individual engaging in systematic, yet biased processing (Ditto & Lopez, 1992; Pyszczynski & Greenberg, 1987; Lord, Ross, & Lepper, 1979). Additionally, heuristic processing is often employed when the incongruence between actual and desired is low. Therefore, effortful processing does not need to be employed to reduce any cognitive discomfort and so processing is often used in a selective fashion; choosing cues that are congruent with pre-existing attitudes and ignoring those that do not confirm beliefs. For example, Giner-Sorolla and Chaiken (1997) found that when participants with vested interests were presented with a supportive argument, they rated this as highly reliable.

Finally, impression-management motivation refers to an individual's immediate social goal, whereby they aim to hold socially acceptable beliefs and attitudes (Chaiken et al, 1996). It causes the desire to express beliefs that are deemed socially acceptable by the individual in the immediate context – be it real or imagined. Heuristic processing is used similarly to the defence-motivation, in that heuristics are selectively used and processed. For example, when conversing with another person with unknown beliefs, individuals often express moderate views to minimise disagreements (Cialdini, Levy, Herman, & Evenbeck, 1973). Again, the impression-management motivation follows the sufficiency principle: If heuristic processing does not sufficiently reduce the confidence gap, individuals are then biased towards achieving social goals via systematic processing. In conclusion, the HSM has advanced its model to include a total of three underlying motivations, with each type being independent to the mode of processing and guided by the sufficiency principle (see Figure 1.1 for a diagrammatic overview of the key principles and hypotheses that make up this model).

ure 1.1 Diagrammatic overview of the Heuristic-Systematic Model (HSM). Key principles are discussed in Section 1.4.1

3 motivations:

Accuracy

Defence

Impression-management

Guided by:

Principle of least cognitive effort

+

Sufficiency principle

availability

accessibility

applicability

Heuristic
(top-down)

Systematic
(bottom-up)

Simultaneous Interactions:

Additivity hypothesis

Attenuation hypothesis

Bias hypothesis

HSM
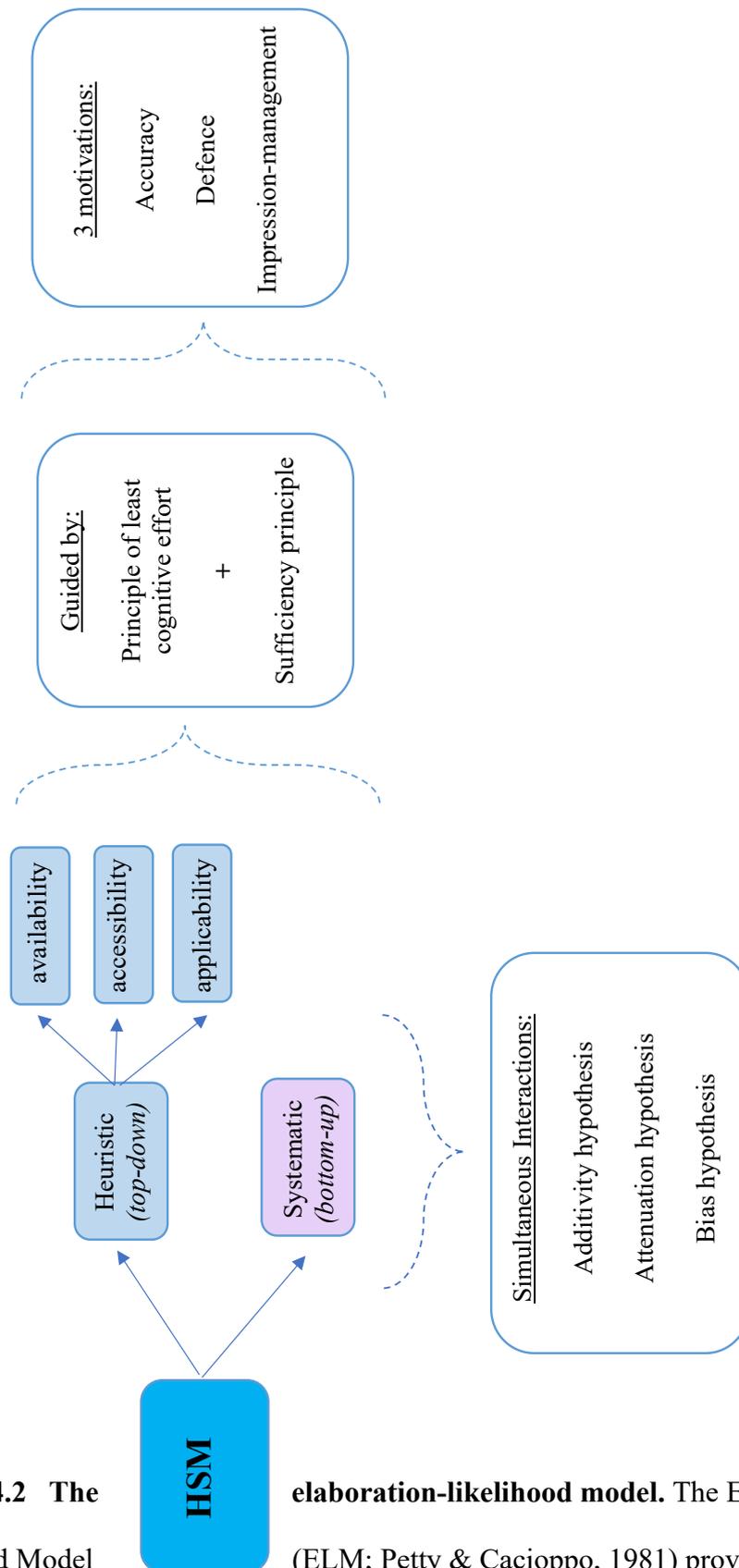
1.4.2 The elaboration-likelihood model. The Elaboration-Likelihood Model (ELM; Petty & Cacioppo, 1981) provides a framework for organising, categorizing, and understanding the basic processes underlying persuasion. The central notion being that persuasion occurs along an elaboration continuum, determined by motivation and the ability to process the task information. Here, elaboration

refers to the extent to which an individual engages in unique cognitive thought about issue-relevant arguments contained in the persuasive message. ELM emphasises two different routes to persuasion – the *central* route and the *peripheral* route (see Figure 1.2 for a diagrammatic overview of the model).

The central route is considered analytical in nature, requiring high motivation for processing of persuasive information. The core assumption being the higher an individual's cognitive elaboration, the higher the likelihood that the individual will carefully process object-relevant information and access relevant associations and experiences from memory to carefully consider the merits of the persuasive message. The ability to scrutinize, elaborate critically upon the presented arguments, and draw personal inferences is the hallmark of this route (Shavitt & Brock, 1994). The ELM proposes that attitudes formed via the central route are enduring and predictive of future behaviour because they are more integrated within a person's belief system (Cialdini, Petty, & Cacioppo, 1981), and so are more resistant to counter-persuasion compared to those formed via the peripheral route (see O'Keefe, 2008).

Processing via the peripheral route is thought to be less cognitively demanding because simple cues and 'rules of thumb' are used to form decisions and judgments using the persuasive message and environmental characteristics provided (Cafferata & Tybout, 1989). Cialdini (1984) identified six specific peripheral cues: reciprocation (feeling obligated to judge a message as credible based on past experience), liking (attractiveness or likability of message source), social proofing (feeling pressured by peers/source), consistency (relying on past thoughts and feelings), authority (perceived expert or authority figure and therefore considered trustworthy) and scarcity (message perceived to be present for a limited timeframe and hence, accepted swiftly).

The peripheral route is often followed when motivation and/or ability to elaborate upon the message content is low. It allows a position to be adopted without the need for extensive and cognitively-demanding thought (low cognitive elaboration) using cognitive

11

short-cuts and heuristics ("I agree with people that I like") that trigger acceptance without deliberate and conscious thinking (for example, if we are distracted or unmotivated). As such, these peripherally-processed attitudes and beliefs are relatively transient, susceptible to counter-persuasion and less predictive of subsequent behaviour (Petty, Cacioppo, & Schumann, 1983).

However, environmental and personal factors can inhibit systematic and analytical processing (for example, environmental noise, lack of time or need for cognition) which leads to a reduction in cognitive resources (Fiske & Taylor, 1991). This reduction then limits the amount of elaboration individuals are able (and willing) to invest (Cacioppo & Petty, 1980). In these circumstances individuals increasingly rely on cues and heuristics to make decisions (Cafferata & Tybout, 1989). The cognitive elaboration continuum describes the amount of elaboration an individual gives to a persuasive message and how this can vary from one variable and contextual situation to another, dependent on motivation and cognitive ability of the individual. It proposes a trade-off whereby central and peripheral routes influence attitudes at different levels along the cognitive elaboration continuum (Petty & Cacioppo, 1986b).

At one end of the continuum, cognitive elaboration occurs when individuals are highly motivated and have the ability to engage in central route processing. At the other end of the scale, low elaboration likelihood occurs when an individual is low in motivation and/or cognitive capacity, processing message content in the form of peripheral cues (Petty & Cacioppo, 1986; Hamilton, 2004). Petty (1994) cites four hypotheses to explain why the impact of peripheral cues reduces as elaboration likelihood increases. The first of which is known as *cue-salience hypothesis*. Despite having potentially attended and processed the cue, individuals view this as less salient or accessible when expressing attitudes due to the effortful cognitive engagement they have engaged in. Secondly, Petty describes the *cue-loss hypothesis*, whereby consideration and high elaboration reduces cue impact and undermines its influence on information processing. The *cue-extremity hypothesis* derives

12

from Tesser's notion (Tesser & Conlee, 1975) that an attitude can be polarised due to increased thought. High elaboration likelihood leads to a reduction in thought about a peripheral cue, thus resulting in it being evaluated less extremely and having a reduced impact on the end attitude. Finally, *cue-weighting hypothesis* states when undergoing high elaboration processing, peripheral cues are seen as less relevant to the end result and thus reduces its impact on the cognitive elaboration process (Petty, 1994; Pierro, Mannetti, Kruglanski, & Sleeth-Keppler, 2004).

It has been argued that as one moves up the elaboration continuum, specific features of the persuasive message such as argument quality will have a high impact on the decision-making process (Petty & Wegner, 1999). Similarly, as one moves down the elaboration continuum, increased weight is given to peripheral cues. In other words, ELM has been criticised for failing to account for multi-channel processing (Stiff, 1986). However, Petty and Wegener (1999) point out that this is not necessarily the case. The trade-off refers to the impact that communication variables have on attitudes. It specifies that a given variable can influence decision-making at different points along the continuum, serving as a cue, an argument, deterring the extent of cognitive elaboration, or producing bias in the processing.

Such a hypothesis does make it difficult to predict the role a variable will have on the processing of persuasive information. For example, under low elaboration, source attractiveness can serve as a peripheral cue ('all attractive people are trustworthy'). However, under high elaboration, this same source could serve as a persuasive message in favour of the argument ('the product being advertised contributed towards her attractiveness'). Under moderate elaboration, the variable can serve as an elaboration moderator: i.e., a determinant of cognitive processing (Petty & Cacioppo, 1984; Petty, Kasmer, Haugtvedt, & Cacioppo, 1987). Finally, this same variable could cause biased processing, whereby the attractiveness of the source puts the individual in a positive mood and thus produces more favourable thoughts.

ELM offers a framework whereby a single variable can influence different processes along a continuum. The extent to which elaboration likelihood is triggered appears to depend on two things: motivation and ability. When motivation is high, the likelihood of high elaboration processing increases. However, this is directly affected by ability. If an individual is highly motivated but does not have the cognitive ability to scrutinise and elaborate on the persuasive content, then high elaboration processing via the central route will not occur. These can be influenced both by external (eg, distraction by noise) and internal events (eg, need for cognition; Petty & Cacioppo, 1984).

Motivation can be seen by manipulating personal relevance of a persuasive topic. Petty and Cacioppo (1979) and Cafferata and Tybout (1989) found that when participants believed the study had little personal relevance, their attitudes remained neutral despite manipulation of strong and weak persuasive arguments. However, those in the highly relevant and strong argument condition showed an attitude shift in favour of the persuasive message. Those shown weak arguments produced a negative shift away from the persuasive message (Petty & Cacioppo, 1986b) which indicates the central route of processing increases as personal relevance increases, and as individuals become highly motivated. Personal importance is believed to increase motivation to be accurate, whereas low personal relevance is driven primarily by the desire for reduced cognitive work (the cognitive miser; Fiske & Taylor, 1991). On the other hand, it may be that high personal relevance conditions stimulate developed schema and knowledge frameworks within individuals and thus enhances elaboration (Markus, 1977).

The majority of research within the ELM determines that attitude change does not occur exclusively via issue-relevant or simple cue association. The ability for variables to influence processing the entire way along the elaboration continuum is highlighted throughout the research within ELM. Despite the benefits for central route processing (endurance of attitudes, predictive of behaviour), a critique is that this can be hard to induce. Individuals must have the ability and the motivation to think critically and

elaborate on the message content, and the arguments produced must be seen as persuasive and compelling when analysed.
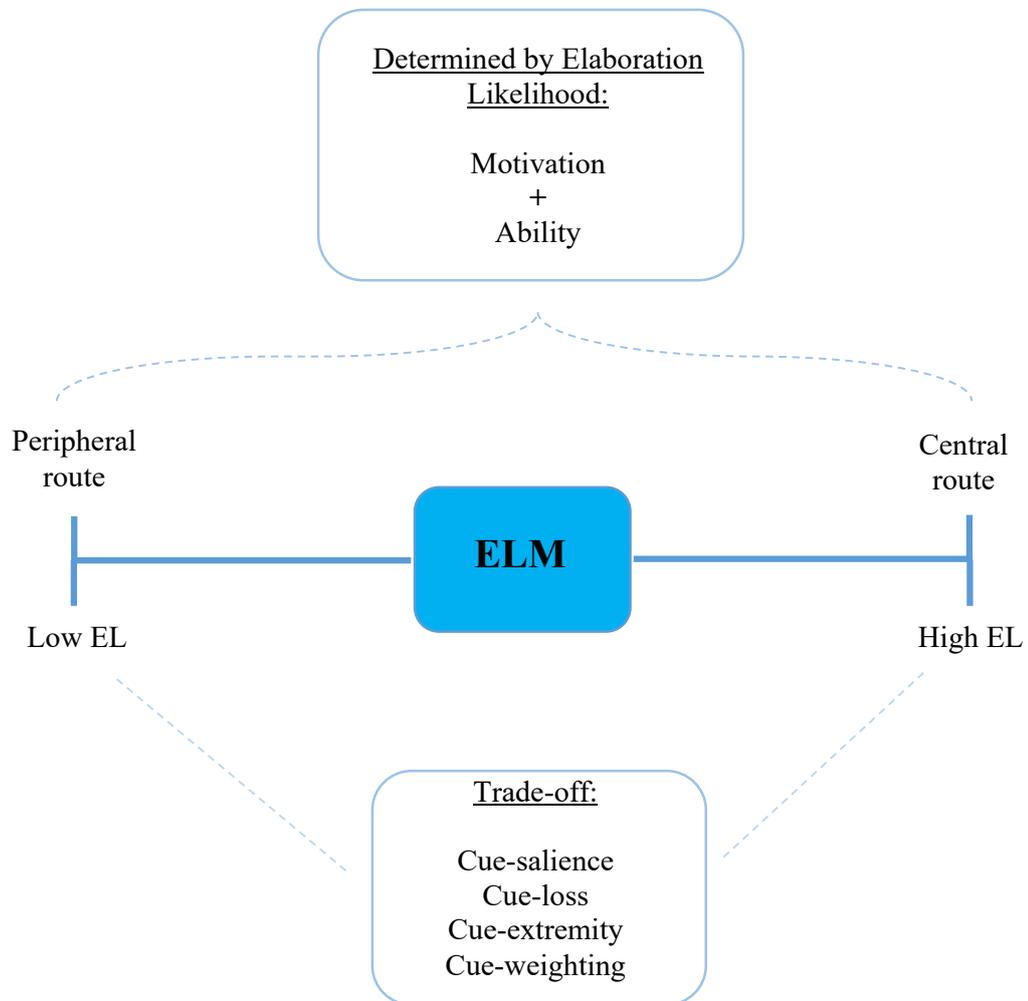
Figure 1.2   Diagrammatic overview of the Elaboration-Likelihood Model (ELM). Key principles are discussed in Section 1.4.2

1.4.3 Comparison of dual-process theories. Evidence exists to provide support for the notion that persuasion occurs via one of two routes (Petty, 1977; Eagly & Himmelfarb, 1978; Chaiken, 1980; Petty & Cacioppo, 1986a; Chaiken, Liberman, & Eagly, 1989). The major assumptions of HSM and ELM are similar - that is, the existence of two qualitatively different persuasion routes. In both, one route assumes more cognitively extensive elaboration, critical thinking and processing of message arguments/content, with the resultant attitudes formed being highly predictive of subsequent behaviour, long-lasting and resistant to counter-persuasion. Conversely, the alternative processing route is less intensive, uses simple heuristics and peripheral cues for instant conclusions, and as a consequence is thought to be less cognitively demanding and often less effective in bringing about persuasion when individuals are highly motivated and able to process critically. Indeed, attitudes and beliefs formed via this route are believed to be much less predictive of behaviour, and much more susceptible to counter-persuasion.

Both ELM and HSM theories assume that sufficient motivation and cognitive ability are primary determinants of information processing, with the 'default' motivation being the ability to hold accurate attitudes and beliefs, balanced with need to exert the least amount of cognitive effort to achieve this goal. In addition, they both agree that the two processing modes can co-occur, albeit in different ways. However, ELM argues the existence of an inverse relationship between central and peripheral processing whereby there is a trade-off: as the importance of one mode decreases, the importance of the other increases and vica versa. However, HSM assumes i) both processing routes can occur simultaneously, and can augment each other in an additive processing manner, *or* ii) the processing routes can clash on occasions, whereby one route becomes more influential than another, producing independent effects on influence according to which route prevails. Irrespective of the differences between the two models, it is clear that to leverage persuasion and maximise the chances that any resultant attitude change will endure, both

countenance the application of techniques to encourage cognitively extensive elaboration and in-depth processing of message arguments.

1.5 Language, Confidence and Persuasion

As outlined in the previous section, persuasion can occur via one of two routes. The route one takes to process persuasion is dependent on the variables being processed, the context, motivation and ability of the receiver, amongst many other factors. Both models state the peripheral/heuristic route is influenced by previous experiences, schema and cues which on their own are not enough to 'persuade', but can serve to add, attenuate or bias the more in-depth and critical thought processes. One such area which contribute to validating and biasing cognitive processing is language. Words translate internal thought into a format that others can understand, and so understanding the role of language in persuasion is important. People are often judged not only by what they say, but how they speak - their linguistic style (Ng & Bradac, 1993).

The programme of research presented in this thesis concerns persuasion and the impact of communication modality, gender, ethnicity and cognitive style. Communication style may differ across modalities, gender, ethnicity and cognitive style, and so its impact could be a useful indicator/predictor of persuasion outcomes. Here, the emphasis is on linguistic style and confidence cues. The majority of research within the persuasion literature has tended to focus on message variables (e.g., message content, speed, tone, intensity etc.) and their effect on the persuasion process (Blankenship, 2001). Accordingly, research investigating the role of language and linguistic style on persuasion outcomes is sparse. However, there are a number of enduring findings that have been used to direct this thesis, as introduced below.

1.5.1 Linguistic style and persuasion. The verbal content of speech can be directly measured using a variety of linguistic analyses. A primary software system often

used within the literature is known as Linguistic Inquiry and Word Count (LIWC), which can also support further analyses of linguistic data, such as linguistic style matching (LSM; Niederhoffer & Pennebaker, 2002; Pennebaker, Francis, & Booth, 2001). Speech and the content of communication has the potential to reveal much in terms of cognitive and emotional state. For example, reflecting where attention is directed, an individual's cognitive thoughts and influences, as well as indicating affect and issues being avoided (Tausczik & Pennebaker, 2010). Person perception has been inferred from the use of pronouns (Ireland & Henderson, 2014), whilst word count has surmised domination of conversation and thus how engaged individuals are: The more communication and unity in speech, the more positive the group performance (Tausczik & Pennebaker, 2010).

However, the timing of unity and agreement is important regarding the motivation of group members. The increased use of assents ('okay', 'yes', 'hmm-mm') towards the end of communication can suggest consensus between subjects, but early approvals can indicate blind agreement suggestive of unmotivated individuals (Leshed, Hancock, Cosley, McLeod, & Gay, 2007). Furthermore, cognitive mechanisms in speech ('know', 'ought') and prepositions ('above', 'with') are indicative of higher cognitive thought, often providing more complex information (Tausczik & Pennebaker, 2010). So, function and content words that make up linguistic word style is indicative of the cognitive processes occurring during communication, providing cues to psychological, cognitive and motivational states, independent of their semantic content.

Research has indicated that perceived power affects impression formation and attitude change. Powerful speakers are perceived as more confident, competent, intelligent, likable and trustworthy than powerless speakers, an effect that has been found across a multitude of contexts including courtrooms, classrooms, and interviews (Conley, O'Barr, & Lind, 1978; Haleta, 1996; Holtgraves & Lasky, 1999; Parton, Siltanen, Hosman, & Lagenderfer, 2002). For example, during witness testimony, powerless speakers - exemplified by linguistic features such as hesitations ('umm', 'err', 'you know', 'I mean')

- are often perceived as having low competency and thus indicating a lack of confidence in their verbalisations (Parton et al., 2002). On the other hand, powerful language (which tends to be absent of the above linguistic features [Blankenship & Holtgraves, 2005; Carli, 1990]) results in higher credibility and acceptance of information advocated by the witness compared to a powerless linguistic style (Erikson, Lind, Johnson, & O'Barr, 1978).

The research concerning power in language for persuasion has, however, produced conflicting results, and so the picture is far from clear concerning its influence on information processing. Some have reported powerless language does not affect persuasion (Gibbons, Busch, & Bradac, 1991) whereas others have claimed that powerless language has a direct effect on susceptibility of persuasion (Holtgraves & Lasky, 1999). More recently, Hosman, Huebner, and Siltanen (2002) found that powerless language decreased persuasion suggesting that a lack of power reduces perception of confidence and knowledge in the subject area, encouraging the receiver to generate counterarguments and thus resist persuasive attacks (Bradac & Mulac, 1984). These differences may, however, be the result of different modes of communicating so when arguments are presented in hard copy print and written down, powerless language has less impact on persuasion compared to spoken communication which occurs either via audio or video formats.

Sparks, Areni, and Cox (1998) found very little effect of power differences when messages were presented in print format. Print format has the limitation of not transferring paralinguistic aspects of speech through the medium. Such properties within powerless language cannot be adequately transferred in a written context ('umm', 'err', tone of voice or pauses in speech for example). Thus, receivers process the information based on argument quality and linguistic style in the form of language power appears to have very little effect within this medium. Additionally, responding to the persuasive message does not have to occur in real-time, allowing receivers to read through and process the relevant arguments at a pace which suits them. Conversely, in real-time interaction formats (audio, video or FtF), the salience of the speaker is enhanced and diverts attention away from

message arguments, possibly reducing cognitive elaboration (Petty, Cacioppo, & Goldman, 1981). Consequently, the impact of an individual's linguistic style appears dependent on context.

Research has failed to 'find' the exact powerless markers used to investigate persuasion, assuming measures to be roughly equivalent and can, therefore, be combined with equal weighting (Blakenship & Holtgraves, 2005). In an attempt to explain the multitude of findings surrounding linguistic power within the persuasion process, the ELM (Petty & Cacioppo, 1986a & b) reports power can act as a peripheral cue (Holtgraves & Lasky, 1999). When cognitive elaboration is low, linguistic power limits the processing of message details and focusses decision-making on the perception of the speaker or source (Sparks & Areni, 2008). The confidence heuristic (see Section 1.5.2) suggests that a powerless speech style represents a lack of knowledge and confidence on behalf of the speaker, thus resulting in a resistance to persuasion. On the other hand, when argument quality and power in speech style are consistently high, the confidence heuristic results in increased perceptions of accuracy and intelligence, resulting in higher persuasion susceptibility (Areni & Sparks, 2005). In other words, a confident speaker using a powerful speech style induces the confidence heuristic.

Alternatively, linguistic style can induce central processing via high cognitive elaboration, biasing and inhibiting the processing of persuasive arguments. Biasing influence occurs when recipients elaborate on the arguments being made, engaging in counter-argumentation when powerless language is used, and can even produce boomerang effects (Hovland, Janis, & Kelley, 1953). Additionally, when recipients are motivated and engaged in high cognitive elaboration, the use of a powerless speech style can distract the receiver, focussing cognitive thoughts towards the speaker in order to explain their perceived lack of confidence and therefore producing less message-related thoughts (Gibbons et al., 1991; Sparks & Areni, 2002). This serves to limit elaboration of the content of the message and biases information processing.

1.5.2 The confidence heuristic. The confidence heuristic initially proposed by Thomas and McFadyen (1995) posits that communication of strength and confidence in beliefs and attitudes is portrayed via the expression of degrees of confidence relative to that belief or attitude. The reliability of an expressed attitude is based on the expression of confidence given to it. Confidence is often a way to assess the quality and reliability of a speaker's information, with those expressing high levels of confidence habitually seen as more accurate and correct in their information and knowledge. Those who express higher levels of confidence enable the exertion of subjective views onto others and are more likely to persuade others to change their attitudes (Sniezek & van Swol, 2001). Often, in real-life tasks and decisions, an accurate answer is not always apparent or directly observable. Thus, the confidence of a person is frequently used to make inferences regarding the speaker's accuracy (Paese & Kinnaly, 1993). As a result, a highly confident speaker is often perceived to be competent, knowledgeable, likable, intelligent and credible compared to that of a low confident or doubtful speaker (Leippe, Manion, & Romanczyk, 1992; Price & Stone, 2004). Additionally, the confidence heuristic has been reported to behave similarly in both face-to-face and instant-messaging contexts (Pulford, Colman, Buabang, & Krockow, 2018). This is similar to the self-validation hypothesis, which claims confident thoughts (metacognition) guides attitudes, when can subsequently guide behaviour (Briñol & Petty, 2004).

Wesson (2005) investigated the influence of confidence on decision-making and found that those with a high level of uncertainty in their choices were more likely to use the confidence heuristic and base their subsequent choice decisions on sources with a higher confidence. This provides credibility to the suggestion that those who are persuaded have a lower initial confidence prior to a persuasion discussion as suggested by London, Meldman, and Lanckton (1970a&b). However, as with any heuristics, the confidence heuristic is prone to error and can produce negative results, especially in the criminal

justice system. For example, juries often view a confident and assertive witness as accurate and trustworthy (Erickson, Lind, Johnson, & O'Barr, 1978). This can then impact on potential miscarriages of justice if the witness is incorrect (Krug, 2007; Wells, Small, Penrod, Malpass, Fulero, & Brimacombe, 1998).

Loftus (1974) demonstrated this effect in the research of an eye-witness account which was either seen as credible, discredited or where no eye-witness was provided at all. Her results showed that the discredited witness was almost as influential in terms of producing a guilty verdict as the credible eye-witness, when compared to having no witness at all. The confidence heuristic is employed, even when the credibility of a speaker is damaged. Whitley Jr. (1987) suggests this is perhaps due to the act of perceiving a witness as credible even if discredited, compared to having no witness at all. Thus, the confidence heuristic can bias judgements in decision-making, relying on the communication of confidence rather than competence. Therefore, it seems that the expression of confidence is not necessarily an expression of accuracy or quality (Wesson, 2005).

On the other hand, some researchers have noted an interaction between confidence and argument quality, whereby argument quality interacts and moderates the effect of the confidence heuristic. For example, Zarnoth and Sniezek (2002) found that a highly confident speaker was more influential than a low confident speaker when presenting a strong argument. However, when a low confident speaker presents a low-quality argument, their influence on persuasion is higher than that of a highly confident speaker presenting the low-quality argument. Thus, a relationship appears to exist between argument quality and the confidence heuristic, whereby argument quality needs to match the confidence expressed. It may be that a speaker's language style needs to represent their perceived confidence, thus satisfying the language expectancy theory (LET; Burgoon, 1995). The results can be compared to London, McSeveney, and Tropper's (1971) research, whereby participants were seen in a negative light when overconfident in their communication,

perhaps due to the mismatch in argument quality and subsequent confidence, leading to assumptions that the speaker is over-confident and unlikable (Wesson, 2005).

Research supports the notion that individuals use expressions of confidence to guide judgements and decisions via the confidence heuristic. However, confidence appears to influence persuasion when argument quality matches linguistic confidence perceptions. Thomas and McFadyen (1995) question the assumption that this heuristic is indeed a general cognitive heuristic, as differences have been found in gender. For example, findings have revealed that women often use language which portray higher amounts of doubt and express uncertainty to a greater extent than men (Furrow & Moore, 1990). However, it should be noted that much of this research is now over twenty years old. One key issue which should be noted regarding epistemic modality and the confidence heuristic is the issue of a 'preciseness paradox' (Teigen, 1990). Individuals are not always truthful in their portrayal, bluffing or guessing can still occur in a confident linguistic style, despite false information being told. Additionally, this can go the opposite way, where a lack of self-confidence leads to a miscommunication of epistemic modality.

Epistemic modality is considered a part of linguistic modality, which relates to the speaker's state of knowledge, certainty, belief and degree of likelihood about a topic, expressed through the use of words within linguistic style (Rubin, 2010). It refers to the way in which a speaker communicates their doubts, deductions and subjective conviction, existing on a continuum and ranging from doubt, to intermediate probability and through to certainty (*think, probably, might, it's possible, know, certain, positive*; Berry, 1960; Fabre, 1991; Westney, 1986). Due to the complex nature of language, there are often a multitude of words and expressions individuals can use to express their subjective confidence in speech, thus making it difficult to accurately measure and comprehensively cover (Hamm, 1991).

1.5.3 Expressed confidence. Expressed confidence consists of linguistic content whereby individuals attempt to resolve a disagreement (Maslow, Yoselson, & London, 1971). London, Meldman, and Lanckton (1970a & b) distinguished expressed confidence as a message variable during observations using The Jury Method (JM) - an enduring paradigm for investigating persuasion (see Chapter 3). Expressed confidence encompasses confidence in self (Cs) as well as doubt in others (Do). On the opposite end of this continuum, doubt consists of is confidence in others (Co) and doubt in self (Ds). London et al. (1970a) calculated a 'vector of persuasion' which allows the measurement of expressed confidence in speech using the 4 confidence markers described, whereby:

$$\text{Vector of Persuasion} = \text{Confidence} - \text{Doubt} = (Cs + Do) - (Ds + Co)$$

This vector allows simultaneous measurement of persuasive force and resistance to persuasion within naturalistic and dyadic face-to-face communication. Despite individuals not differing on argument quality, persuaders were found to have a significantly higher vector of persuasion (30.6) compared to persuadees' (12.5). Thus, the larger the vector, the higher the likelihood the individual will become a persuader. Maslow, Yoselson, and London (1971) systematically investigated expressed confidence by manipulating the amount a confederate portrayed whilst keeping all other elements constant. Thus, if persuasion occurs within conditions of higher expressed confidence, greater credibility is gained for the expressed confidence hypothesis. Maslow et al. (1971) used an adapted JM paradigm, whereby participants were given a 'transcript' of another student's views regarding the criminal case study. To manipulate expressed confidence, slots were created to include the confidence/doubt words without altering the argument's structure or meaning. For example, "(*Obviously/I don't know) my first (concern/conflict) is deciding what to base liability on*" (p. 236). Persuasion was measured by calculating the confidence levels of participants pre- and post- exposure to the transcript. This produced a significant

result, revealing those who received the confident transcript were more persuaded than those who had received the doubtful transcript.

Expressed confidence does not only occur via language and speech. Other channels can contribute to this persuasive effect. Maslow et al. (1971) investigated expressed confidence using body language. A neutral speech, which consisted of the same argument as their first study was audio-recorded to control for content and para-language. An actor then recorded three videos, miming the argument throughout the three conditions, whereby he was instructed to portray confidence, doubt and neutral body language. The neutral and controlled argument was subsequently dubbed over the top and given to participants (who later noted no awareness of the actor being dubbed). The authors found that increased kinesic confidence increased persuasion despite the fact the argument stayed constant. London (1973) expanded on the concept of multiple channels and investigated paralinguistic doubt by observing the recorded tapes from London et al.'s (1970a) original JM paradigm. He found that doubt, when expressed paralinguistically, ('*umm-ing*', '*er-ing*', repeating words and pausing) was significantly more likely to occur in persuadees', whilst individuals expressing reduced paralinguistic doubt were more likely to become the persuader. It can therefore be reasoned that confidence, when expressed verbally, paralinguistically and/or via body language is a significant predictor of persuasion.

Having indicated that confidence has a significant effect on the persuasion outcome within the JM, London et al. (1970a) decided to break down the concept of expressed confidence into three distinct segments of time to understand its influence and progression through the dyadic discussion. They revealed that both the persuader and persuadee vector of persuasion increased between times 1 and 2. However, vectors for both subjects decreased dramatically at time 3. This is interesting, especially when applied to London, McSeveney, and Tropper's (1971) study, which found that the articulation and coherence of arguments were not fully formed until the last third of the discussion, at which point the cumulative mean vector had reduced dramatically for both persuader and persuadee.

Following on from these results, there have been two suggestions in an attempt to understand the fluctuations in the vectors of persuasion over the jury discussion.

Firstly, the persuader decreases their expressed confidence due to the knowledge that the persuadee is changing their attitudes and thus further persuasion attempts would be futile and a waste of energy. Secondly, a reduction in expressed confidence occurs in order to reduce a negative affect whereby over-confidence occurs. The persuader lets the persuadee down gently and precludes their persuasion attempts. London et al. (1971) investigated these two hypotheses using an adapted JM paradigm. Participants, rather than engaging in a dyadic discussion, were asked to pass notes to and from another participant. However, the 'other' participant did not exist and the notes were pre-written, differing only in terms of expressed confidence (low, moderate and high). London et al. (1971) claim the low confidence (LC) condition represents the expressed confidence of a typical persuadee. The moderate confidence condition (MC) representing a typical persuader, and the high confidence (HC) condition representing 'much more confidence' than a typical persuader (p. 362). They report that the participants in the MC condition became less confident over the discussion period of their initial verdict, indicating persuasion with participants at least weakening in their confidence for their initial verdict choice.

However, both LC and HC participants became *more* confident in their initial verdict choices, showing a resistance to persuasion. Consequently, the assumption is made that persuaders reduce their confidence in the last third segment of the discussion (as seen in London et al., 1970a) due to the implicit or explicit knowledge that expressing 'too much confidence' can cause the persuadee to resist their persuasive attempt. London et al. (1971) went further and revealed that a high level of antagonism was felt in participants within the HC condition. Their data reveals that an increasing level of HC left participants feeling increasingly negative towards the persuader. Wesson (2005) supports these findings. Manipulation of confidence using high, moderate and low testimonies were used, and too much confidence had a detrimental effect on social attractiveness ratings by

participants. Low and moderately confident speakers were perceived as more friendly and trustworthy compared to the highly confident speaker. However, this did not carry over to other attributes, with intelligence, optimism, knowledge, self-confidence, professionalism and a lack of nervousness all increasing with enhanced confidence, supporting the confidence heuristic.

At first glance, these studies seem contradictory. However, the previous study (London et al., 1970a) simply observed confidence within the persuasive context and did not manipulate it directly. Therefore, what might have been perceived as high confidence in London et al.'s study (1970a) was simply considered moderate confidence in the London et al.'s (1971) later study. As a direct result of London et al.'s (1971) findings, a curvilinear relationship was postulated regarding expressed confidence and persuasion. Expressed confidence has a positive correlation with persuasion up until a certain point, at which stage a negative correlation is established (increased expressed confidence leading to a resistance to persuasion attempts). Taking this one step further and drawing on the work of Abelson and Miller (1967), negative persuasion is hypothesised to occur at the extreme end of the curvilinear relationship. Abelson and Miller report that not only do participants resist persuasion, but they are persuaded to change their opinion contrary to that advocated by persuader; resulting in negative impressions of the persuader and boomerang effects (Brehm, 1996; Hovland, Janis, & Kelley, 1953). In other words, certain linguistic features can cause resistance in the receiver. For example, research has shown that a dogmatic linguistic style can induce psychological reactance (Quick & Stephenson, 2008). Dogmatic language is considered to be forceful, controlling and explicit in its usage, pressuring the listener to conform and change their behaviour and attitudes in line with the message advocated (Miller et al., 2007). Words include imperatives like 'must', 'need', and absolute allegations such as, 'cannot deny', 'is extremely serious' (Bushman, 1998). Such linguistic style is thought to elicit reactance in the listener, creating a perceived threat to autonomy of opinion choice and thus lead to negative persuasion and boomerang effects

in the receiver (Cohen, 1962). This effect has been found in a wide range of studies including reactance to the curbing of alcohol consumption (Dillard & Shen, 2005; Rains & Turner, 2007) and increasing exercise regime (Quick & Considine, 2008).

1.5.4 Linguistic style matching (LSM).

Confidence in speech is not the only aspect of linguistic style which can feasibly influence persuasion. Linguistic style matching (LSM) has previously been investigated with regards to rapport and negotiation outcomes, finding successful interactions are often correlated by a high LSM score (indicating a highly similar linguistic style). Being mindful that correlation does not predict causation, and little research has investigated persuasion outcomes with regards to LSM, it nevertheless lends itself to further exploration utilising dual-process models of persuasion.

During communication, linguistic patterns are often mimicked and coordinated by individuals, and this concept of coordination is thought to be essential to the success of an interaction (Taylor & Thomas, 2008). Convergence on accents, rate of speech, and syntactic categories such as pronouns and verb tense can enhance the ease of interaction, and increase efficiency (Gonzales, Hancock, & Pennebaker 2010). One hypothesis that helps to explain the link between a successful interaction and linguistic matching is the coordination-rapport hypothesis (Tickle-Degnen & Rosenthal, 1987). This hypothesis reports a correlation between enhanced coordination during communication and the increase in perceived attraction and rapport of the conversational partner. Park and Burgess (1924) define rapport as "the existence of a mutual responsiveness, such that every member of the group reacts immediately, spontaneously, and sympathetically to the sentiments and attitudes of every other member" (p. 893). In other words, coordination leads to enhanced likability, creating a friendly connection and rapport (Tickle-Degnen & Rosenthal, 1990). Therefore, the more two people like and respect each other, the higher the rapport and consequently, coordination. However, one issue with this hypothesis is that

it is based on the coordination of non-verbal behaviour and therefore has not focused on speech mimicry.

Communication-accommodation theory (CAT; Coupland & Giles, 1988; Giles & Coupland, 1991) on the other hand, focusses on the strategic accommodation individuals make in their speech whilst interacting in a social context. The theory proposes that individuals continually alter their linguistic convergence/divergence to increase, decrease or maintain social distance between conversational partners. Linguistic convergence can cover a range of linguistic elements, such as pitch, tone, rate of speech and word use (Scissors, Gill, Geraghty, & Gergle, 2009). For example, similarity in speech has been found to increase perceived supportiveness and predictability and thus reduce social distance and negative outcomes as they converge on linguistic style (Berger & Bradac, 1982). This can be seen in criminal trials, where witnesses alter their answering style as each question is phrased and heard, accommodating more or less coercive questioning by barristers (Gnisci, 2005). Equally, research has shown that distancing oneself from social interaction decreases linguistic style matching where insiders, who were attempting to steal confidential documents from fellow work colleagues, reduced their linguistic matching over time compared to non-insiders (Taylor et al., 2013).

In a similar vein, interactional alignment theory (IAT; Pickering & Garrod, 2004) places emphasis on an individual's innate tendency to align their linguistic style such as grammar and word choice during interactive dialogue. IAT claim such language style matching is linked to a common understanding between the conversational partners, and thus leads to enhanced cooperation and goal achievement (Menenti, Pickering, & Garrod, 2012). An individual's speech is thought to prime the listener to subsequently speak in a similar style, which in turn, primes the previous speaker and so on. This circle of linguistic influence and convergence effects cognition; priming the conversational partners to begin to think in similar ways, such as their speech converges. People who use the same linguistic style to describe things often think about things in the same way too, having

implications within the persuasive literature: high linguistic style matching leads to enhanced comprehension and persuasion over time (Markman and Makin, 1998). For example, Pennebaker and King (1999) found that language reflects individual differences in personality and self-expression, so language convergence would therefore imply perceptions of the topic being discussed are similar, signifying harmony and parallel attitudinal beliefs.

IAT has found that imitation occurs at varying levels of linguistic style, including grammar (Branigan, Pickering & Cleland, 2000), syntax (Levelt & Kelter, 1982) and phonetics (Pardo, 2006). Again, this is deemed to be an automatic process, requiring little cognitive effort on behalf of the speaker, leading to individuals often unaware of their converging speech styles. It is argued that such innate mimicry is due to an evolutionary desire to foster and maintain social relationships (Lakin, Jefferis, Cheng, & Chartrand, 2003). Researchers have used linguistic mimicry to predict social interactions and even shape the nature of collaborations (Tausczik & Pennebaker, 2013). LSM (Niederhoffer & Pennebaker, 2002) uses a computerised analysis software which calculates the distance between two subject's linguistic styles, measuring and predicting social dynamics during discussions (Gonzales, Hancock, & Pennebaker 2010; Pickering, & Garrod, 2004).

The degree to which coordination of word usage occurs can be measured during naturalistic conversations using this unobtrusive analysis software, primarily using function words such as prepositions, conjunctions and pronouns, which are often collected using LIWC software. It is estimated that 0.05% of vocabulary within English consists of function words, and yet these make up 55% of all speech: written, read or heard (Tausczik & Pennebaker, 2010). Function words are considered context-free, therefore allowing LSM to be used for a variety of speech topics and discussions, whilst contexts such as computer—based communication, formal interviews and informal dialogue can be interpreted effortlessly and efficiently (Gonzales, Hancock, & Pennebaker, 2010). In

addition, function words are non-consciously produced and therefore very difficult to manipulate and alter in speech patterns (Pennebaker & King, 1999).

Research investigating the matching of function words within interaction has generally found that increased LSM leads to enhanced team performance, rapport and negotiation (Ireland & Pennebaker, 2010; Pickering & Garrod, 2006; Richardson, Taylor, Snook, Conchie, & Bennell, 2014). More in-depth research has resulted in specific linguistic-style matching, as first-person pronouns (such as 'I', 'we') have been found to heighten the cohesiveness of a group, often after a tragedy has occurred. For example, after 9/11, American's linguistic style was reported to change, consisting of an increased usage of first-person pronouns, both in FtF and online contexts (Cohn, Mehl, & Pennebaker, 2004).

LSM seems to occur in a variety of different contexts. Gonzales, Hancock and Pennebaker (2010) found that a higher score on LSM was correlated with likability of group members across both FtF and CMC conditions. In the FtF condition, a high score on LSM was significantly related to task performance. Yet this did not occur in the online condition, suggesting that reduced media richness inhibits certain aspects of LSM on behaviour and cognition. Online communication is difficult, as there is only one channel in which to observe and mimic behaviour. Accents, pitch and tone of voice, as well as non-verbal behaviours such as smiling cannot be converted or observed through this channel. Niederhoffer and Pennebaker (2002) initially investigated LSM in a computer-based environment, using turn-by-turn interactions as well as conversational FtF interaction using the Watergate tapes to retroactively investigate LSM. The results showed that dyadic interactions exhibited high LSM for both scenarios, regardless of context or social status. However, they did find that anonymous participants interacting via the computer had significantly lower speech style matching than those who were identifiable, perhaps due to a perceived lack of responsibility and deindividuation. As a result, Niederhoffer and Pennebaker (2002) claim that engagement, rather than rapport (as stated in the

coordination-rapport hypothesis) is the key to coordination. They found that when LSM was applied to a computer-based interaction, LSM was not correlated to subjective ratings of rapport. Instead, LSM was high for pairs who reported positive *and* negative interactions. This coordination-engagement hypothesis implies that high engagement in a conversation (be it positive *or* negative) influences and positively correlates with verbal (and non-verbal) coordination. Due to engagement being the central element in this hypothesis, it is a lack of interest and engagement that leads to reduced coordination, rather than low rapport as previously suggested (Tickle-Degnen & Rosenthal, 1990). Alternatively, perhaps the concept of anonymity and not knowing the other conversational person leads to reduced levels of rapport which in turn, leads to a reduced LSM result. This research lends itself to the suggestion that as the likelihood of elaboration increases and the central route is engaged in processing persuasion (via high motivation and engagement), LSM will increase.

Chapter Two: Influences on Persuasion

2.1 Overview of Chapter Two

Chapter two will introduce four key areas relevant to the programme of research presented in this thesis, which are believed to impact on persuasion outcomes. These are as follows: i) context, specifically the mode of presentation of the persuasive message. For example, synthetic environments versus face-to-face contexts, ii) cognitive style, specifically Need for Cognitive Closure (NfCC) and Delusional Thinking, iii) ethnicity and, iv) gender.

2.2 Digital Modalities (DMs)

Technology is becoming increasingly integrated into our everyday lives. Digital modalities (DMs) allow interactions that overcome traditional barriers of distance and time. Yet, intelligence interviewing outside of traditional face-to-face environments has yet to be fully explored, either theoretically or empirically despite communication increasingly utilising DMs at an unprecedented rate. In 2017, over 55% of the population had access to the internet (Internet World Stats, 2018) and so investigating the feasibility of persuasion in various synthetic environments is timely. For example, in 2015, the National Security Strategy reaffirmed cyber threat as a Tier One threat status, considered the highest priority for action (Cabinet Office, 2011; HM Government, 2016).

Online environments enable communication to occur widely, effectively and consistently. This allows for interaction and deliberation between conversational partners across large geographical distances. DMs encompass online synthetic environments, virtual reality environments, text-only computer mediated communication, and video-enabled communication, amongst many others. However, collaborative DMs are the focus of this thesis, specifically the use of text-only computer mediated communication and communication in an immersive virtual reality environment, via avatars. The primary aim

is to address the clear gap in the persuasion literature concerning cognition in online environments.

2.2.1 Social cognition within digital modalities. Social cognitive theory argues that cognition is a product of a reciprocal interplay between intrapersonal, behavioural and environmental determinants (Bandura, 1991; Fiske & Taylor 2013). Accordingly, understanding the reciprocity between intrapersonal (internal to the communicator) aspects and external environments offers exciting opportunities for the understanding of persuasion within different and novel modalities. Environmental contexts are professed to greatly influence the effectiveness of the communication process (Guadagno & Cialdini, 2007; Wilson, 2003; Zanbaka, Goolkasian, & Hodges, 2006). A digital medium can significantly alter and constrain social, contextual and perceptual cues that influence perceptions of behaviour, intentions and personality within face-to-face (FtF) interactions (Walther, 2011). A key aspect thought to affect social cognition is anonymity: the ability to hide, or significantly alter your perception of self to others.

Anonymity within digital modalities allows the freedom of communication without influence from physical attributes such as gender, ethnicity and age, amongst others. Identities are fluid inside DM's, with individuals having the possibility to experience and create persona's online which do not reflect their true-life selves (Joinson, McKenna, Postmes, & Reips, 2009; Yee & Bailenson, 2007). This privacy can reduce the expression of stereotypical behaviour, in effect 'even the playing field'. This theory is often better known as the Equalisation Hypothesis (Dubrovsky, Kiesler, & Sethna, 1991) which can promote gender equality as stereotypes can no longer be projected. This is evident in a study conducted by Matheson (1991), who manipulated the availability of gender cues within a synthetic environment. No significant difference in person perception was observed when gender cues were made unavailable. However, in a second study when gender cues were apparent, perceptions differed; with women seen as more cooperative

and men as more exploitive in line with traditional stereotypes (Thayer & Ray, 2006). The findings support the equalisation hypothesis in that anonymity excludes gender stereotypical expectations when conversing anonymously. However, some evidence suggests that gender stereotypical behaviour is heightened when using digital modalities (Postmes, Spears, Sakhel, & de Groot, 2001), undermining the equality of online contexts. Postmes and Spears (2002) reported that anonymous individuals had pronounced differences in linguistic dominance in relation to typical gender stereotypes. In other words, a lack of identifiability resulted in greater gender differences, promoted via the exchange of linguistic style.

Anonymity can alter cognition and the resultant behaviour, with research providing evidence of visually anonymous interactions leading to higher levels of self-disclosure compared to identifiable discussions (Joinson, 2001; 2007). It seems that the lack of identifying features within the medium facilitates honest and open discussions that would not have been possible when interacting FtF (see Taylor & Dando, 2018). Likewise, the elimination of cues often means reduced social comparisons, and thus the persuasiveness of arguments presented are at the forefront in terms of opinion shifts within such modalities (El Shinnawy & Vinze, 1998). A compromise for anonymity leads to arguments presented deemed less credible (the discounting hypothesis; see Rains, 2007), thus reducing influence on personal opinions (McLeod, 2000). Reduced social presence often seen within DMs means there is reduced 'loss of face' effect, whereby anonymity allows individuals to change their opinion without judgment from self or others, leading to enhanced persuasion and often more extreme decisions, particularly when taken as a collective (Isenberg, 1986).

The absence of paralinguistic and contextual cues within DMs means that communicators often become more forceful and uninhibited in their linguistic style in order to get their point across. The level of anonymity the medium provides facilitates unregulated behaviour (McGuire, Kiesler, & Siegal, 1987). As a result, a lack of self-

awareness and increase in deindividuation serves to enhance polarisation (Isenberg, 1986). The act of having lower social presence when communicating online leads to enhanced contribution of extreme arguments, changing the opinion towards the collective. Group behaviour becomes more extreme and impulsive, whilst behaviour becomes decreasingly socially distinct (Diener, Fraser, Beaman, & Kelem, 1976). In direct contrast however, Haines, Hough, Cao, and Haines (2014) investigated the effect of anonymity using a synchronous DM and found that anonymous arguments were less likely to shift opinions than arguments that were identifiable. Likewise, increasing the number of supporting arguments did little to shift intentions, suggesting that identified arguments are more persuasive than anonymous arguments (Rains, 2007).

2.2.2 **Media richness theory.** Media Richness Theory (MRT: Daft & Lengel, 1986) is the degree to which a medium allows direct, personal and instant feedback, and comprises of four sub-dimensions: 1) the number of cue systems that the modality supports, 2) immediacy of feedback, 3) potential for natural language, and 4) personalisation of the message to the individual (Walther, 2011). The theory posits that FtF is a richer social medium than the limited communication channel of DMs, whereby non-verbal and paralinguistic cues are absent. Media-rich modalities allow for unconstrained transmission, reducing ambiguity and facilitating the clarification of message content in an instantaneous manner; in turn, leading to better performance on decision-making tasks (McGrath & Hollingshead, 1993, Mohammadi, Park, Sagae, Vinciarelli, & Morency, 2013). For example, individuals on a day-to-day basis regularly process and evaluate face, body and voice cues, often at a subconscious level and with a great deal of accuracy (Ambady & Gray, 2002). Hammick and Lee (2014) who compared individual differences within FtF and virtual reality environments found that media richness played a large part in behavioural change, with participants reporting less intention to alter their behaviour when there was a lack of visual and/or auditory cues. Conversely, there is also research that

opposes the MRT, finding that decisions and attitudes remain unchanged when various DMs are manipulated (Suh, 1999; Walther, 1996; 2011). However, the DM paradigms utilised vary (blogs, IM, email, chat rooms, VR etc.), and so it is difficult to generalise findings across studies. This may be why support for the media richness theory is mixed: digital modalities exist on a continuum of media richness leading to a lack of clarification when it comes to ascribing a unitary richness value.

    2.2.3 Computer-mediated communication. Computer-mediated communication (CMC) is an umbrella term, used to describe long-distance communication via a connected computer. This aspect of communication is no longer a novel experience, with the majority of individuals exploiting CMC for social and business everyday - answering emails, texting or blogging online (Brignall III & van Valey, 2005). Its appeal lies in the fast exchange of information and data over large distances, often at low costs. In recent years, social media has played a large part in the promotion, mobilisation and influencing of public opinion via online persuasion and propaganda (see Raymer & Harris, 2017). In an era where discussions are increasingly conducted online, and owing to the lack of perceived repercussions and enhanced anonymity this medium affords (Lea & Spears, 1991), it is important and timely to understand persuasion in this modality.

    Nguyen, Bin, and Campbell (2012) conducted a meta-analysis and found an equal number of papers supporting and refuting enhanced self-disclosure online. One reason for this discrepancy could lie within the variation of the synchronicity of the CMC medium. Synchronicity refers to the timing of message exchanges, with highly interactive and relatively quick exchanges considered synchronous in nature (Instant Messaging [IM] for example). This level of synchronicity is seen to enhance involvement and interaction coordination (Reardon, 1991). On the other hand, asynchronous CMC (such as email) is broken up into distinct and discontinuous time fragments. IM is higher in media richness than asynchronous CMC and evokes higher trust in communication partners, enhancing

self-disclosure rates (Burgoon, Chen, & Twitchell, 2010). Burgoon and colleagues found that dyads reported enhanced trust and were viewed as more sociable when communication was instant and immediate. The more involvement and similarity members felt with others (ie, FtF), the more they perceived them as trustworthy, sociable and persuasive.

Okdie, Guadagno, Bernieri, Geers, and Mclarney-Vesotski (2011) found that compared to FtF interactions, individuals communicating via CMC formed enhanced negative impressions of their conversational partner and found it difficult to sustain the conversation or to generate topics. CMC is thought to be much more effortful than FtF interactions - it doesn't enable the rapid exchange of information as easily as FtF, nor does it facilitate intuitive exchanges. Nowak, Watt, and Walther (2009) note that people are cognitive and behavioural misers, thus preference for a task that requires the least amount of effort and cognitive load is often seen as the preferable option. It is therefore reasonable to assume reduced rates of likability and persuasion when communicating using CMC than FtF.

However, Bargh, McKenna, and Fitzsimons (2002) found that during first-time encounters, individuals were liked better by their conversational partner when communicating in an internet chat room compared to FtF. Likewise, McKenna, Green, and Gleason (2002) controlled the conversational partner, meaning that in both conditions the participants were conversing with the same person but were unaware of this fact. Participants reported enhanced liking of the individual when they chatted online than when they met FtF. This seemingly contradictory research supports the notion of equalisation online (Dubrovsky, Kiesler, & Sethna, 1991) whereby the quality and content of the conversation forms the basis of liking the individuals. This is compared to FtF interactions, which are formed, in part, on superficial features such as attractiveness to influence positive affect. Dual process models of persuasion state less rich mediums (such as asynchronous CMC) have fewer heuristic cues available and therefore individuals process the persuasive message content using a systematic style of cognitive reasoning (Chaiken &

Eagly, 1983). Peripheral cues such as attractiveness, ethnicity and status cannot be used to justify decisions, therefore differences in cognition and persuasion arguably occur when compared to traditional FtF contexts.

Much of the research using CMC has been dominated by the use of asynchronous mediums, making it difficult to expand to synchronous CMC contexts. Early research conducted by Chaiken and Eagly (1983) show how an easy-to-comprehend message was more persuasive when presented using rich mediums (video condition), whereas a difficult-to-comprehend message was more persuasive when presented in a written format, where cues become less salient. In addition, when the communicator was deemed 'likable', higher persuasion effects were seen within the video and audio conditions. This indicates that the peripheral route of processing was taken compared to when the persuasive arguments were written, and implies that the type of medium directly affects the degree of attitude change. Non-verbal behaviour has been directly linked to liking and rapport-building (Ambady, Bernieri, & Richeson, 2000) indicting that restriction of non-verbal cues will lead to reduced persuasion, with the peripheral route favoured in such situations. In addition, lower levels of 'liking' from conversational partners whilst using CMC suggests a reduction in persuasion overall.

A key issue relates to generalisability of the findings from Chaiken and Eagly (1983). For example, employing a unilateral persuasive interaction is difficult to generalise to a two-way dyadic persuasive communication style. Guadagno and Cialdini (2002) investigated persuasion using a bilateral persuasive interaction, manipulating gender and the medium in which participants communicated, using a confederate to form the dyadic pairings. They found that women were less likely to be persuaded via email compared to FtF, whereas men did not differ in persuadability across the mediums. The asynchronous CMC does not encourage or enhance the ability to form a personal bond with the communication partner, resulting in women becoming less agreeable in this medium. Men however, are seen to be task-oriented and seek independence, thus producing no difference

39

in agreeableness between the two mediums (Kimbrough, Guadagno, Muscanell, & Dill, 2013).

Di Blasio and Milani (2008) developed a study looking at opinion change in small groups across FtF and CMC modalities. By introducing a novel and contradictory piece of information into the discussion, they observed fewer opinion changes and thus higher resistance to persuasion within the CMC modality when compared to the FtF modality. This is reasoned to be due to the CMC modality activating the central/systematic route of processing more easily when discussing messages via a written format than when directly conversing FtF. Text-based CMC restricts non-verbal cues, leaving individuals to focus heavily on the written content and the arguments presented during the conversational exchanges, assessing the quality and content of the messages. As a result, this leads to engagement of the critical and elaborate route of processing and thus a systematic persuasion outcome which focusses on the arguments presented. Therefore, individuals using CMC had the opportunity to reflect on the content of the messages being exchanged and thus the ability to process the content at a much deeper level of cognitive processing than the FtF modality.

The methodologies used to investigate CMC research varies drastically from study to study; self-reports, unilateral persuasion online and dyadic effects of persuasion. Furthermore, studies investigate the impact of CMC using individuals who know each other offline, whilst others using strangers who have never met before. This lack of consistency could account for the mixed research findings and lack of a unified theory towards persuasive communication within DMs.

2.2.4 Virtual reality environments (VREs). It is no longer the case that virtual reality environments (VREs) are of primary interest to hard-core gamers. Research investigating the application of VREs is increasing, particularly with a view to better understanding how technology might enhance real world effects. Recent applications

include training, education and therapy, with virtual recreation of crime scenes and remote video witness evidence in courts all benefiting from advances in synthetic environments (e.g. Bailenson, Blascovich, Beall, & Noveck, 2006). However, very little research has observed or measured the influence of persuasion using interactive virtual reality technology.

A VRE is a synthetic, computerised representation of a natural or created world consisting of 3-D representations, which are presented to the user in such a way that they temporarily suspend belief of their real environment (Bailenson et al., 2006; Rizzo, Difede, Rothbaum, Daughtry, & Reger, 2013a). VREs allow individuals to interact and embody avatar representations and thus allow a creative and interactive space that can have the potential to be novel, fictitious and unrepresentative of the offline world (Dando & Tranter, 2016). VREs are highly customisable spaces and facilitate a high degree of interactivity, despite potential geographical restrictions (Atlas & Putterman, 2011).

A user's experience within immersive virtual reality is often controlled through the use of head-mounted display (HMD) technology which projects the synthetic environment stereoscopically (Guadagno, Blascovich, Bailenson, & McCall, 2007). This means that the participant's movements are interpreted by the computer and allow appropriate parallel movements within the VR modality. VR is considered immersive when the participant is said to inhabit the avatar. In other words, the participant's point of view is through the eyes of the avatar and the field of view changes when the participant moves their head which in turn, changes the digital direction of gaze. In addition, a digital environment is considered collaborative when it allows multiple users to interact in the same digital space irrespective of real-life location.

It is estimated that there was a market size of 27 million for augmented and virtual reality in 2018, and this is forecast to reach 209.2 million by 2022 (Statista, 2018a). However, research does not seem to reflect this growth. Studies conducted into persuasion have been directed to traditional FtF modalities, with comparisons (if made) often using

41

CMC asynchronous mediums. This is a clear gap in the literature, with research needed that explores such VREs in order to understand cognition within these ever-growing and increasingly popular DMs.

Players within VR are increasingly communicating, playing and conversing as avatars. Avatars are a digital projection of the self, representing a synthetic reality (Fox & Ahn, 2013). They allow individuals to customise their social identity to become less identifiable, or even create an entirely fictitious, novel and unrepresentative online identity; customising features such as eye colour, hair colour, height, gender and race etc. It is reported that individuals utilising avatars in DMs often do so to be unique and creative in their representations, thus allowing them to explore and interact in a way that reality would not allow (Lin & Wang, 2014). Due to the enhanced realism and interactivity that these mediums afford, it is conceivable that avatars have a direct influence on social cognition, effecting attitudes and behaviours on- and offline. This is highlighted in a study by Yee and Bailenson (2007), whereby participants were found to change their behaviour and merge their cognitive style in alignment with the avatar they were assigned. For example, when assigned an attractive avatar, participants were reported to be more intimate when interacting inside the immersive VRE. Similarly, when assigned taller avatars, participants behaved more confidently during a negotiation task compared to individuals assigned to shorter avatars.

The act of conforming one's behaviour in accordance to their representation is referred to as the Proteus Effect (Yee & Bailenson, 2007). This stems from Bem's (1972) self-perception theory, which claims that attitudes are inferred and developed from observations of one's own behaviour. A virtual environment enhances the ability for self perception to occur, making it easier to externally observe one's own behaviour via an avatar. Festinger (1957) reports that humans strive for cognitive consistency and therefore manipulate their cognitive states and subsequent attitudes in line with their observed behaviours. The Proteus effect is additionally present in language style, observed via the

use of CMC. Palomares and Lee (2010) coded written interactions between participants who embodied an avatar of the opposite-gender. They found that the language used by individuals was stereotypically associated with that of their avatar's gender, as opposed to the language of their own gender.

Yee and Bailenson (2009) expanded on this concept. They found that conformity to individual identity cues extends to real-life interactions post VR. For example, those given taller avatars in the VRE negotiated more aggressively in subsequent FtF exchanges indicating that cognitive behavioural changes in DMs extend to subsequent FtF interactions. However, it should be noted that this was an immediate transition and thus it is not known for how long this cognitive transference lasts. However, it is important to note that this research deliberately manipulated the avatars given to participants. In most cases, individuals are free to choose their digital representation online, and research suggests that most choose to express themselves in a manner similar to their everyday self (Taylor, 2002). It insinuates that potential changes to social cognition based on avatar representation in VR is dependent on a multitude of contextual factors: the ability to customise effectively, the number of possibilities available, the purpose of the game or exercise, knowing who they are speaking to versus being anonymous, confidence in self or awareness of outgroup and/or minorities.

Zanbaka, Goolkasian, and Hodges (2006) report that college students found avatars just as persuasive as real people: virtual characters are just as effective at changing attitudes as real people in face-to-face settings. Cross-gender interactions were also found, whereby male speakers were more persuaded by female speakers, and vice versa compared to same-gender dyads. This is in alignment with the FtF literature on gender and persuasion and shows that virtual avatars using human voices are just as affective in persuading opinion change as FtF exchanges. This feasibly expands into the dual-process models of persuasion, implying that VREs follow a similar path of processing as FtF: the

default being the heuristic route to persuasion where available, applicable, and accessible (see Figure 1.1).

Immersion is a psychological state, perceiving oneself as enveloped by and interacting in a VRE which provides a constant stream of stimuli and experiences (Witmer & Singer, 1998). Higher immersion leads to higher rates of social presence. A sense of presence is considered a fundamental component of VREs - a belief that the participant is present in the DM despite being physically present elsewhere (Witmer & Singer, 1998). This is often enhanced with a HMD, whereby the individual's physical presence and movements are translated seamlessly in the synthetic environment, blurring the line between reality and digital (Usoh, Alberto, & Slater, 1996) which leads to a greater sense of connection to their environment and to the avatar.

Witmer and Singer (1998) developed a presence questionnaire, yielding high internal consistency. They found that control was just as important as involvement to create a sense of immersion in the VRE, and thus a sense of presence. A highly immersive VR provides much more realistic experiences and thus more realistic reactions with a high degree of presence. This has been applied to real-world research using highly immersive VR as an affordable pain management solution. A recent case study by Hoffman and colleagues (Hoffman, Doctor, Patterson, Carrougher, & Furness III, 2000) revealed a 50% reduction in pain and anxiety ratings from burn-care patients when fully immersed in a VRE compared to when they were distracted by a video game task. The conclusion is that the highly immersive experience reduces awareness of real-life self; increased immersion is negatively correlated with pain reduction (Hoffman, Patterson, & Carrougher, 2000). Grigorovici (2003) proposed a two-step model of VR on persuasion, whereby more presence leads to enhanced arousal. This in turn reduces the impact of depth of processing for persuasive messages leading to decision-making becoming more implicit and heuristically processed. This mirrors the persuasion route observed in FtF interactions.

Indeed, Usoh, Alberto and Slater (1996) found that a highly present individual is more likely to behave in a similar manner in VR as everyday FtF interactions.

VREs allow researchers to control confounds but is deemed more realistic than a typical laboratory study. It is a half-way point between a highly-controlled but unrealistic laboratory study, and a field experiment which is highly realistic but heavily influenced by extraneous and confounding variables. There is an upsurge in research which suggests that social interactions using VRE are governed by the same principles as social interactions in the real world (Banakou & Chorianopoulos, 2010; Morina, Ijntema, Meyerbröker, & Emmelkamp, 2015). This has significant implications when it comes to researching hypotheses previously limited in terms of reality constrictions, now being studied in VR and generalised towards real-world applications (Yee, Bailenson, Urbanek, Chang, & Merget, 2007).

Moritz et al. (2014) captured this concept when investigating error feedback on delusional thinking patients. Moritz and colleagues developed a task which involved individuals walking down a virtual street and later describing the characters of fellow pedestrians. The aim is to make the participants aware of the fallibility of their judgements, thus reducing delusional ideation through the exposure of multiple errors. Indeed, the authors reported that this brief VR experiment led to a reduction in paranoid severity in individuals with delusional ideation. This is in direct comparison to the control group consisting of depressed individuals, who remained unchanged in their cognitive style. Similarly, recent research into virtual reality cognitive therapy has shown that new learning can take place when fears are presented to patients with persecutory delusions. Additionally, and perhaps more importantly, this learning can be transferred to the real world (Freeman et al., 2016). This highlights the practicality of VR research and the potential uses in social cognitive research.

2.2.5   Linguistic style in digital modalities. Despite people being under the impression that they are anonymous on the internet, true anonymity is, in fact, hard to achieve. For example, linguistic features are argued to be specific to gender inside CMC in a similar manner to FtF interactions (Herring & Stoerger, 2014). Research also supports the claim that gender stereotypical behaviours continue to occur, with males posting lengthier exchanges in asynchronous CMC; typically beginning and closing the conversations and asserting opinions as facts. Females on the other hand, will post shorter messages, apologise more often and express support for others (Herring, 1993; 1996; Savicki, Lingenfelter, & Kelley, 1996). Yet in synchronous CMC, men and women behave similarly in terms of message length and response rates (Herring, 2003). However, this does not simply mean that men and women do not differ when using IM. It is thought that the use of emoticons in synchronous CMC differs between the genders. Women have been shown to increase their uses of emoticons in CMC in an attempt to 'make up' for the lack of social cues available within this medium, and this is shown to occur in both same and mixed-sex dyads (Lee, 2003). Fullwood, Orchard, and Floyd (2013) looked at the use of emoticons in chat rooms and concluded emoticons are significantly more likely to be used by women, reflecting the enhanced emotional expressivity typically seen in traditional FtF contexts (Brody & Hall, 1993).

2.2.6   Summary. Considering that digital and FtF modalities have differences in visual and auditory cues, as well as variances in message delivery, it can be assumed that such modalities will affect the persuasion process differently, and thus alter an individual's intention to change their behaviour, attitudes and/or opinions. However, in terms of the direction of this effect, the jury is still out. There is mixed support for the majority of media-effect theories previously stated within this chapter. For example, support for increased persuadability using DMs derives from a lack of social accountability and 'loss of face' observed within this primarily anonymous medium. This serves to increase

46

persuasion on the merit of the arguments presented, and the changing of one's thoughts and decisions without the 'loss of face' often seen FtF. In addition, there is a lack of effect arising from stereotypical influences which has been shown to decrease the susceptibility to persuasive arguments FtF if such cues are part of an outgroup membership, for example (Dubrovsky, Kiesler & Sethna, 1991). Furthermore, persuasive argument theory (PAT; Kaplan, 1977) states that the use of novel and systematic arguments are more likely to sway opinion and decisions and the change is more likely to last in comparison to changes made via the peripheral route. It is hypothesised that DMs facilitate cognitive processing via the central/systematic route due to an enhanced focus on the messages exchanged and a lack of identifiable contextual and paralinguistic cues.

Alternatively, some research provides support for the view that persuasion decreases whilst conversing in DMs. Compliance is no longer a dominant and contributing factor to opinion changes. Individuals have the ability to be domineering and forceful without the perceived 'negative social consequences' observed FtF and are therefore less likely to simply agree and become swayed by their conversational partner simply because of 'societal pressure'. Moreover, media richness theory (MRT; Daft & Lengel, 1986) posits that DMs have reduced media richness, leading to constrained exchanges of information, which in itself, can be viewed as frustrating and challenging. Expanding on the idea that DMs facilitate a systematic processing style to persuasive arguments, such exchanges would need to stand up to scrutiny to a higher extent than FtF in order to facilitate persuasion or an opinion shift. Consequently, DM messages may serve to decrease persuasion in such contexts. It is evident that the persuasion literature surrounding differential modalities is contentious and inconsistent. Further research into this area, with a view of expansion to novel VR environments would serve to clarify the persuasion literature, investigating the role of persuasion within ever-increasing popular modalities.

2.3 Cognitive Style

Differences in thinking style (better known as cognitive style) concerns an individual's way of managing cognitive tasks, particularly in terms of acquiring and processing information (Kozhevnikov, Evans, & Kosslyn, 2014). In other words, cognitive style refers to the way in which individuals perceive, think and problem solve (Kozhevnikov, 2007; Witkin, Moore, Goodenough, & Cox, 1977). For example, delusional thinking or the need for cognitive closure are thought to directly influence the decision-making process, influenced not only by innate individual differences but also as a direct result of contextual environments (Freeman, Pugh, & Garety, 2008; Webster & Kruglanski, 1997). The tendency to seize upon readily available information and freeze further cognitive processing to achieve a rapid is a hallmark of these two measures, which are thought to complement each other and provide a range in which one can assess cognitive biases for persuasion outcomes. These two elements of social cognition will be now be discussed with regards to attitude change and the decision-making process.

2.3.1 Delusional thinking. Delusional thinking is typically described as the maintenance of false beliefs, arising from an atypical evaluative judgment using reasoning biases (Garety & Hemsley, 1994). These beliefs are firmly sustained despite what is considered incontrovertible evidence to the contrary (American Psychiatric Association, 1994). For example, Buchy, Woodward, and Liotti (2007) found schizotypy subjects were unwilling to reduce the plausibility of their decisions based on disconfirmatory evidence. Psychotic symptoms refer to quantitatively less severe traits of schizotypy within the general population, measured on a continuum rather than at extreme poles whereby delusional thinking is considered a primary symptom (Peters, Joseph, Day, & Garety, 2004; Poulton et al., 2000).

Delusional thinking is well established within the literature for both clinical and non-clinical populations and can be quantitatively and psychometrically measured within

the normal population using the revised Peter's Delusional Inventory (PDI-R: Peters et al., 2004). Peters and colleagues initially administered the measure to both healthy and psychotic subjects, and despite showing higher scores within the psychotic sample, the range of scores collected were almost identical between the two groups. They cite nearly 10% of the healthy adults scoring higher than the average of the psychotic sample, supporting the notion of a continuum scale and a degree of overlap between healthy and deluded symptoms (Peters, Joseph, & Garety, 1999). As a result, individuals can be measured on the delusional ideation scale to investigate and measure decision making and subsequent heuristic biases associated with delusional thinking.

Originally a 40-item measure, the PDI-R currently comprises an abbreviated 21 items, measuring the multi-dimensionality of delusional thinking comprising 11 components. The three sub-themes include distress, preoccupation and conviction, which have been shown to provide greater discrimination between 'healthy' and deluded populations (Peters et al., 2004). However, the majority of the sample used to develop the PDI-R were white British. This is not representative of wider ethnicities and could thus imply that delusional ideation is a Western phenomenon. Increases in delusional thinking is correlated with a number of biases within cognition, such as jumping to conclusions and being rigid in attitude change (Colbert & Peters, 2002; Colbert, Peters, & Garety, 2006). These cognitive biases are often the extent of research within the area of delusional ideation for both the general and clinical populations. A focus on these biases within the general population will be focused upon for the remainder of this thesis.

2.3.1.1 *Cognitive biases.* Cognitive biases are distortions in acquiring, processing and interpreting information from the immediate environment, and are thought to contribute not only to the formation of delusions, but also to their maintenance (Bell, Halligan & Ellis, 2006; Garety & Freeman, 1999; Moritz & Woodward, 2006; van der Gaag, 2006). The most common bias within the field of delusional thinking is known as

the Probabilistic Reasoning Bias whereby individuals employ a number of heuristic devices to guide their expectations and reasoning (Garety, Hemsley, & Wessely, 1991). The Probabilistic Reasoning Bias is measured using the Beads Task (Huq, Garety, & Hemsley, 1988) where individuals are asked to observe two glass jars containing different coloured beads at a ratio of 85:15 and vice versa in the second jar. These are then removed from view and a random selection of beads are drawn. The individual must guess which jar the beads are likely to have been drawn from (participants are permitted as many draws as they wish before making their final decision – however, the sequence of each draw is often pre-determined). Huq and colleagues found that clinically-deluded subjects required, on average, less evidence of further draws before making their judgments (mean of 1.22 compared to healthy and psychiatric control groups: 2.60; 3.58 respectively). They also had a higher level of certainty that their judgment was the correct one, indicating a probabilistic reasoning bias when making judgments.

This is a robust finding, which has been replicated on numerous occasions (Fear & Healy, 1997; Garety et al., 1991). The cognitive style associated with probabilistic reasoning bias (forming irrational and superfluous conclusions based on significantly reduced information) is better known as a jumping to conclusion bias (JTC; Garety & Freeman, 1999) and is thought to be pivotal both in the formation and the maintenance of delusional thinking. The literature robustly claims that on average, 50% of people with delusional thinking show a JTC bias in comparison to just 10-20% of people without delusions (Freeman et al., 2008). This statistic implies that the cognitive bias is not the sole cause of delusional thinking, but more than likely contributes to the acceptance of delusions in cognitive style. In addition, longitudinal analysis has shown JTC is a robust and stable measure of delusional thinking style (Peters & Garety, 2006).

An updated version of the Beads Task utilising digital modalities was used to investigate delusional patients, alongside a psychiatric control and the healthy population (Speechley, Whitman, & Woodward, 2010). Here, the delusional group showed an

exaggerated preference for colour matching, which supports hypersalience of evidence-hypothesis matches (Balzan, Delfabbro, Galletly, & Woodward, 2012). This result appears to be specific to delusions, as the effect was not found when the deluded schizophrenic group were subdivided on the severity of hallucinations. Peters, Thornton, Siksou, Linney, and MacCabe (2008) support this finding when they split psychotic patients into deluded vs. not-deluded symptoms and investigated JTC using a number of different tasks. Delusional thinking style did not show any difference when participants were grouped based on a diagnosis for schizophrenia. Balzan et al. (2012) investigated the hypersalience mechanism by examining 'rule of thumb' heuristics. They reported that deluded individuals had greater susceptibility to reasoning heuristics supporting the presence of a hypersalience mechanism. This in turn is reasoned to amplify spontaneous heuristic reasoning compared to a deliberate and cautious cognitive style observed in non-deluded participants. It implies that individuals high in delusional thinking have a cognitive bias towards accepting information that implies a certain viewpoint, and rapidly seizing on this information.

Hypersalience of hypothesis-evidence matching indicates the impulsive termination of evidence collection in delusional individuals and supports a bias against disconfirmatory evidence (BADE), which is a hallmark of delusional patients, given that they refuse to reduce their plausibility ratings for lure items over a task, when disconfirmatory evidence becomes apparent (Zawadzki et al., 2012). This cognitive bias of inferential reasoning has been investigated in delusional-prone individuals using the BADE paradigm (Buchy, Woodward, & Liotti, 2007; Woodward, Moritz, Cuttler, & Whittman, 2006; Woodward, Moritz, Menon, & Klinge, 2008). Participants are given a series of online statements followed by 4 interpretations; 1 truthful, 1 absurd and 2 lure items. It is designed to test whether individuals are able to accept new and disconfirmatory evidence. Compared to controls, delusional participants are less likely to accept the final 'truthful' item post-lure items; in other words, they are unable to reduce their initial confidence levels when their

principal belief is strong, even when the delusional scenario extends to affectively neutral material (Moritz & Woodward, 2006; Woodward et al., 2008). However, delusional individuals scored equal to controls when their initial beliefs were weak suggesting a reasoning bias against disconfirmatory evidence is specific for strongly held beliefs (as is the case in delusions). Furthermore, the notion that the BADE paradigm produces a significant difference between schizophrenic patients, healthy delusional thinking subjects and a psychotic control supports the view that this cognitive bias is not simply a construct of psychotic illness in general (Woodward, Buchy, Moritz, & Liotti, 2007).

The beads task comes from the theoretical underpinnings of the Bayesian formula, assessing the way in which conclusions are reached on the basis of empirical evidence and provides an optimal strategy for probabilistic reasoning, which can be mathematically calculated (Moutoussis, Bentall, El-Deredy, & Dayan, 2011). However, the current Beads task indicates that delusional populations actually reason according to rational judgments, whereas healthy populations (control) are instead overly cautious in their reasoning styles. Maher (1992) points out that delusional patients had better Bayesian reasoning (and made few errors) due to the probability after just 2 draws being 97% that the 2 same-coloured beads originated from the higher ratio jar with the equivalent colour. It indicates the normal population are (in direct contrast) overly cautious compared to the delusional sample, who arguably reached a decision at the earliest, 'objectively rational' point. However, it should be noted that there was considerable variability within the deluded group, with 47% making a decision after the first draw (showing an 85% Bayesian probability) and thus highlighting the impulsive decision-making characteristic of delusional thinking - something that only happened once in the control group (Huq et al., 1988). Additionally, the common draw ratio of 85:15 leaves little discrimination and actually favours a rapid decision style, with the ratio allowing Bayesian reasoning after just 2 draws (Dudley, John, Young, & Over, 1997). This could be considered psychometrically

inadequate to test the JTC hypothesis and further studies are needed to change the reasoning ratio to allow for enhanced discrimination between the samples.

Alternatively, a review carried out by Garety and Freeman (1999) concluded that 11 out of 14 studies showed evidence of a cognitive bias not due to a general deficit in probabilistic reasoning, but rather a specific data-gathering bias. Psychiatric groups have been found to adjust their information requests depending on the probability ratio presented indicating impulsivity is not the cause. For example, Dudley et al. (1997) found that when evidence gathered was predetermined by the experimenter, delusional subjects did not differ in probability judgment reasoning compared to non-delusional participants. Peters and Garety (2006) also found delusional subjects remained unchanged when presented with a memory aid, indicating that the JTC bias is not directly related to either impulsiveness or a memory deficit but instead is a specific bias in data-gathering rather than any difficulty in cognitive reasoning (Peters & Garety, 2006). There is a tendency for delusional individuals to choose to seek less information, supporting the hypothesis of a data-gathering bias rather than a specific deficit in reasoning.

Cognitive biases in delusional thinking (confirmation bias, hypersalience of hypothesis matches, BADE and JTC) point to another well-known cognitive bias: the need for cognitive closure (NfCC; Kruglanski, 1989). For example, the JTC in delusion-prone individuals has been shown to be driven by a motivation to hastily confirm beliefs (Bentall, Corcoran, Howard, Blackwood, & Kinderman, 2001). Colbert and Peters (2002) found that healthy individuals who scored high in delusional ideation also scored significantly higher on the need for cognitive closure scale, which is consistent in that there is a stable cognitive style contributing to the development of delusional traits.

2.3.2   Need for cognitive closure. The need for cognitive closure (NfCC) refers to an individual's discomfort in experiencing cognitive uncertainty or ambiguity and often results in quick formulations of opinions, regardless of subsequent reduction in decision

53

quality (Webster & Kruglanski, 1994). It is considered an epistemic motivation (arising from Lay Epistemological Theory; see Kruglanski, 1990). Epistemic motivation is aptly defined by De Dreu, Nijstad, and van Knippenberg (2008) as "*a willingness to expend effort to achieve a thorough, rich, and accurate understanding of the world, including the group task or decision problem at hand*" (p. 23). It is primarily concerned with how people acquire and form knowledge bases and consists of two distinct phases, a) *hypothesis generation* (whereby individuals form the basic cognitive structure using accessible information), and b) *evaluation generation* (assessing the validity of the constructed contents and thus their confidence in the information). NfCC is inversely correlated to the motivational underpinning of epistemic knowledge formation leading to the desire for any answer that avoids ambiguity, inducing urgent and permanent tendencies. Individuals 'seize' upon readily available informational cues and subsequently 'freeze' on that information, ensuring the safeguarding of the acquired decision and maintaining cognitive closure.

Despite the need for cognitive closure implying an active search and cognitive motivation to achieve the correct answer, once a decision has been made, individuals often 'crystalise' this decision and prevent further information processing, thus freezing their cognition and lowering epistemic motivation (Roets, van Hiel, & Cornelis, 2006). The higher the individual scores on the NfCC scale (Webster & Kruglanski, 1994), the shorter the sequences (hypothesis generation and evaluation generation) and the faster the heuristic phenomena (seizing and freezing: Kruglanski, Orehek, Dechesne, & Pierro, 2010) in social situations. An individual high on NfCC has a strong desire to reach any conclusion resulting in a primacy effect upon available cues; they are less likely to embrace opinion deviates. It allows for quick decision-making but results in rigid thinking styles. Individuals are thought to desire order and structure alongside secure and stable knowledge, as ambiguity and a perceived lack of closure cause cognitive discomfort (Festinger, 1957).

However, individuals high in their need to avoid closure (low NfCC) are orientated towards gathering and processing information, and are more willing to change existing knowledge structures (Webster & Kruglanski, 1997). These individual differences are thought to exit on a continuum, a spectrum ranging from one extreme (motivated to achieve closure urgently and permanently) to another (motivated to avoid commitment to a definitive opinion). This is considered to reflect findings from delusional thinking, whereby a score high on NfCC scale leads to impulsivity and a jumping to conclusions bias, often on the basis of inconclusive and incomplete evidence (Kruglanski & Webster, 1996). The dominant epistemic process that determines an individual's NfCC on this continuum is dependent on an inherent and consistent personality tendency or an inconsistent situational constraint on cognitive capacity (Webster & Kruglanski, 1997).

The preliminary motivation for closure being proportionate to the perceived costs and benefits such closure will achieve and thus can be manipulated by direct situational factors. For example, when a task is particularly time-contingent, a heightened NfCC is advantageous, freeing up cognitive capacity to engage in continued information processing of alternate tasks. Additional variants of situational constraints include dull, unattractive or otherwise cognitively effortful tasks, time pressures, environmental noise, proximity to deadlines, mental fatigue and alcoholic intoxication; all serving to enhance an individual's NfCC and subsequently influencing cognitive and social functioning (Kruglanski & Webster, 1996).

Alternative to situational constraints, Webster and Kruglanski (1994; Kruglanski, Webster, & Klem, 1993) developed the NfCC scale where they found motivated closure varied as a stable individual difference which can be reliably measured. It is widely assumed that those who score highly on NfCC scale exhibit similar behaviours and processing patterns as those situationally induced to increase their NfCC. The scale itself is a widely used 42-item measure, specifically identifying five psychometric properties (desire for predictability, preference for order and structure, discomfort in ambiguity,

decisiveness and close-mindedness). Ratings are on a six-point Likert scale (1 = strongly disagree) with low composite scores indicating a low NfCC.

NfCC is related to a wide variety of social cognition concepts ranging from enhanced stereotypical judgments and impression primacy effects, to the correspondence bias and persuasion. For example, research attests to individuals high in NfCC becoming more stereotypical and simplified in their judgments (Ford & Kruglanski, 1995; Klein & Webster, 2000; Kruglanski, Pierro, Mannetti, & DeGrada, 2006). Motivated to achieve rapid closure, individuals seize on readily available information accessible in their memory and over-utilise pre-existing attitudes and prejudices. A study by Jamieson and Zanna (1989) used time pressure to enhance participants' motivation for cognitive closure and found those who initially held negative attitudes towards women in management positions were more likely to devalue the CV's of women compared to men (despite the information of both genders considered to be equivalent). This supports the theory that individuals high in NfCC (either situationally or inherently) are biased in their judgements, relying on pre-existing knowledge structures to gauge their decisions, enabling a rapid decision to be made. Even if individuals do not inherently obtain judgmental cognitive structures, situationally manipulating such structures has been shown to have a similar effect. For example, when primed with a negatively and positively valenced adjective (reckless/ambitious), participants high in NfCC characterised an ambiguous target in relation to the prime presented (be it negative or positive) – once again supporting the notion of seizing upon readily available information (Ford & Kruglanski, 1995).

2.3.2.1 *Persuasion and NfCC.* Dual process models accounting for persuasion in the literature (namely heuristic-systematic and elaboration-likelihood models: Chaiken, 1987; Petty & Cacioppo, 1986b) suggest there are two routes to persuasion, influenced by cognitive and motivational aspects. High NfCC individuals rely on pre-existing schemas, pursuing readily available heuristic cues and ceasing in further information processing

56

when forming their judgments (Klein & Webster, 2000). This therefore makes them much more susceptible to persuasion attempts compared to low NfCC, who systematically process the incoming information and base their judgments on the scrutiny of the message arguments. Klein and Webster (2000) report that individuals low in their dispositional need for cognitive closure processed the persuasive message systematically, engaging in the central route of persuasion. However, those scoring high in NfCC processed the information heuristically and relied on peripheral cues to inform their judgments. Regarding the dual-process theories of persuasion, the HSM defence motivation (see section 1.4.1) claims that an individual motivated to defend their existing attitudinal beliefs (thought to occur in individuals high in need for specific closure), will be guided by the sufficiency principle; directly influencing epistemic motivation (Chaiken, et al., 1989; De Dreu et al., 2008). Thus, if an individual is satisfied with the quality and quantity of their current knowledge state, further information processing is nullified. However, if the sufficiency principle is not acquired, this will motivate individuals to seek out and process additional information, inducing a reduced need for closure and engaging the central route of processing.

Kruglanski et al. (1993) used the jury method paradigm (JM; London, 1973) to investigate the role of NfCC on persuasion, whereby dyads consisting of a high and low NfCC member were given information manipulated towards a certain viewpoint. When prior information is available, significantly more high NfCC individuals became the persuader whilst the low NfCC individuals became the persuadee. It supports the theory that high NfCC seize upon readily available information and freeze this viewpoint, defending their cognitive closure and are therefore becomes more resistant to persuasion from another individual. Pietrzak, Jochemczyk, Serbin, and Kuśka (2014) support this claim by suggesting high NfCC individuals are less likely to make concessions compared to low NfCC. This is due to the fact cognitive resources would have to be expanded to accept and rebuild knowledge structures, which is demanding on resource capacity.

However, the converse appears to occur if prior information is absent. In their second study, Kruglanski and colleagues (1993) used a confederate in place of the manipulated legal analyses generally found in the Jury Method (JM: see Chapter 3). They found that without all the complete information, individuals high in NfCC became more susceptible to persuasion attempts and changed their verdict more often when compared to low NfCC, who were more resistant. Despite this result seemingly contradicting their first finding, it continues to support the notion that high NfCC individuals' motivation is to achieve closure: If they cannot obtain reliable closure pre-persuasion, then they will become prone to early persuasion attempts in an attempt to rapidly achieve their desired cognitive state. This is due to high NfCC subject's experiencing cognitive discomfort in ambiguous or uncertain tasks, and therefore becoming motivated to reduce the discomfort as quickly as they can. Thus, they peruse readily available heuristic cues and cease in further information processing when forming their judgments (Klein & Webster, 2000). However, when a task is seemingly clear-cut and individuals have a pre-made opinion, high NfCC subjects are motivated to protect this decision, portraying a higher degree of confidence (Federico, Golec, & Dial, 2005).

2.4 Ethnicity

The vast growth and development of online exchanges, blogging and social media highlights the extent to which persuasive messages can reach wider, more diverse audiences, becoming much more global in their reach. Research would therefore be remiss in overlooking the importance of how individuals from different ethnic backgrounds interact, process and respond to interactive persuasive exchanges across varying and far-reaching modalities. For example, Garcia-Gavilanes, Quercia, and Jaimes (2013) found that country-level behavioural features examined using Twitter strongly correlate with cultural dimensions. It indicates that individuals from different ethnic-backgrounds use

social media to achieve alternate end-goals. Research is needed to expand this literature into persuasive exchanges both offline and online.

Ethnicity references social groups and communities which share a common nationality, culture or language (Betancourt & López, 1992). Individuals from different ethnic backgrounds possess different attitudes, values and norms that reflects their cultural heritage (Cox, Lobel, & McLeod, 1991). On an individual level, ethnicity is claimed to be a social-psychological process whereby categorisation of a social group gives the individual a sense of belonging and identity, generating ties for reciprocity. Ethnicity is often associated with culture and is frequently used interchangeably. Hence, ethnicity refers to the ethnic quality or affiliation of a group, which is normally characterised by culture. Because ethnic groups typically interact with each other, ethnicity is a means by which culture is socially transmitted and reinforced, influencing language, behaviour, cognitive and social processing (Barth, 1998).

For the purposes of the research reported within this thesis, the term 'ethnic' is used to refer to the groups of relevance to the research questions that have guided this thesis. One of the most extensively researched and arguably most obvious ethnic differences is the contrast between individualism and collectivism (Ind/Col: Hofstede, 1980). This broad categorisation classifies individualistic cultures as primarily Western societies (UK, USA, Australia and New Zealand) whereas collectivistic research has primarily focused on east Asian countries such as Japan and China. Individualistic cultures place emphasis on autonomy, internal attributes and self-reliance. There is a concern for oneself over others, with self-fulfilment arising from personal accomplishments. Reasoning and judgment are believed to be orientated towards the individual, often due to the assumption that the self is a stable construct (Oyserman, Coon, & Kemmelmeier, 2002). This is in direct contrast to collectivist cultures, which strive for group harmony and membership, placing importance on external events and influences (Triandis, 1989; 2001). Often thought to have common

goals and values, collectivist cultures restrain emotional expressions and put the group collective at the forefront.

There is growing evidence to suggest that inferential and perceptual processes are influenced by one's ethnic and cultural background. Individualistic cultures have an analytic reasoning style, using internal explanations for events and behaviour which are grounded in logical reasoning (Nisbett, Choi, Peng, & Norenzayan, 2001; Nisbett & Miyamoto, 2005). Western education often places emphasis on teaching critical thinking and debate, determining the validity of a statement and analysing key pieces of information. Yet collectivist countries (East and South Asia, for example) often place a high importance on the tradition of respectful learning; developing diligence and endurance (Kühnen et al., 2012). Likewise, there is a greater emphasis on holistic reasoning, explaining behaviour with reference to situational constraints and factors (Varnum, Grossmann, Kitayama, & Nisbett, 2008). This is evident through measurements of linguistic style, with collectivist dyadic interactions resulting in an increased use of 'we' pronouns, in direct comparison to individualistic dyadic conversations which have been found to prioritise personal pronouns ('you', 'I'; Setlock, Quinones, & Fussell, 2007).

The interdependence within collectivist groups, linked to a holistic reasoning style (Varnum, Grossmann, Katunar, Nisbett, & Kitavama, 2008) means collectivists are more likely than individualists to sacrifice personal interests for the attainment of group goals (Bond & Wang, 1983). Subsequently, heuristic cues such as consensus information influences persuasion within collectivist ethnicities (Markus & Kitayama, 1991) indicating higher persuasion outcomes due to differences in reasoning styles across ethnic pairings (Aaker & Maheswaran, 1997; Setlock, Fussell, & Neuwirth, 2004).

Hall (1981) refers to the concept of high versus low context cultures which map onto the concept of Ind/Col. For example, low context cultures (individualistic cultures) focus on the explicit meaning and content of words, using linear and systematic reasoning, like to engage in debate, and focus on rational strategies. High context cultures on the other

hand (collectivist) interpret the meaning of messages and arguments using non-verbal entities such as the tone of voice, gestures and implied meaning. They incorporate the situation into their reasoning and wish to achieve harmony during exchanges.

The body of research outlined in this section would suggest that collectivist cultures are more likely to take the peripheral/heuristic route to persuasion, whilst individualistic cultures prefer systematic and central route to processing information. Nevertheless, it should be noted that this dichotomous view of ethnicity and persuasion is simplistic, highlighting a narrow depiction of the cultural and ethnic complexity of behaviour and cognition. In addition, much of the work has looked at East Asian and American samples which fails to encompass alternative ethnic variations. It is important to note that the key dimensions of ethnicity exist on a continuum (Hofstede, 2011) and therefore research dominating the extremes of this range is not representative of ethnic diversity; one of the key challenges in cross-cultural psychology being to identify structures and constructs at the individual *and* country level.

2.5 Gender

Social Roles Theory (SRT; Eagly, 1987) is the social psychological principle that men and women take on different roles due to societal expectations. For example, male stereotypical behaviour is considered agentic in nature: achieving independence, demonstrating assertiveness, competitiveness and becoming task-focussed. They are less concerned with politeness and often engage in 'flaming' behaviour when conversing online (Herring, 1994; Herring & Stoerger, 2014). Women on the other hand, are thought to be more communal in nature, focussing on forming bonds during interactive exchanges (Eagly & Steffen, 1984). This is reflected in interaction style, with women showing greater agreement and pro-social behaviour than their male counterparts (Carli, 1989; 2001). Carli (1989) ran a study that investigated the role of gender on influence, whereby dyadic pairings would discuss a topic on which they initially disagreed. The results showed

that males gave significantly more opinions, suggestions and directions during group interactions, and disagreed on discussion points to a higher extent than female participants. There is the perception, in previous literature, that men have a higher social status to women, thus are assumed to be more competent and more likely to receive enhanced support for their contributions. However, the majority of such research was conducted over thirty years ago, and as such, societal expectations, gender stereotypes and social roles have changed and become much more fluid in nature.

Gender interactions are thought to be dependent, in part, on the composition of the group. Piliavin and Martin (1978) found that men disagree more with men than women, and women become more dramatic when interacting with fellow women compared to men. Mixed-gender dyads show a convergence of speech towards their partner, thus neutralising and dampening gender stereotypical effects (Mulac, Wiemann, Widenmann, & Gibson, 1988). Hence, the gender of the recipient plays an important and determining role on an individual's behaviour. This was supported by Carli (1989), who found larger stereotypical gender differences in same-sex pairings: Male pairs displayed increased task behaviours and disagreements whereas female pairings displayed increased positive social behaviours and agreements during their interactions. Yet, during mixed-gender dyadic interactions, the only gender effect reported involved enhanced positive social behaviours by females.

There is the perception that males become more engaged in a rational evaluation of a persuasive message than females (Guadagno & Cialdini, 2007) indicating a preference for the cognitively elaborate route to persuasion. Additionally, a meta-analytic review conducted by Eagly and Carli (1981) found that males were influenced less than females, despite the inclusion of non-significant persuasion studies. Women are easily influenced in comparison to males despite discussions on gender-neutral topics; however, this is mediated by the gender of the partner they interact with. Carli (1989) further found that when told they had to attempt to influence their partner, men and women reduced their use of stereotypically feminine behaviour. Yet in parallel, both genders increased their use of a

stereotypically-masculine linguistic style, evidenced by a decrease in agreements and an increase in direct and aggressive influence strategies. Conversely, this only occurred when attempting to persuade a male (Carli, 1990). It suggests there is the underlying perception that male-stereotypical behaviour is more influential during FtF interactions and that the gender of the subject has a direct influence over persuasion behaviour (see Eaton, Visser, & Burns, 2017).

A meta-analytic review supported this view, showing that in mixed-sex groups, men exert more influence than women (Lockheed, 1985). Additionally, the effect of enhanced gender stereotypical behaviour during same-sex dyadic interactions assumes that, to some degree, individuals partake in social influence and exhibit behaviour assumed to be the gendered-norm. Carli expanded on these findings, reporting that both men and women dislike disagreement from a female conversational partner and are thus less likely to be persuaded by a woman during interactive FtF exchanges (Carli, 1990).

2.5.1 Gender and linguistic style. Analysis of gender differences within speech styles and narratives has been investigated in terms of overall structure, as well as more in-depth analysis of phrases and linguistic styles. Nonetheless, the nature of language is complex and thus requires varying degrees of research methodology and analyses, which in turn, makes generalisation of findings difficult within this area. Lakoff (1973) was one of the first researchers to investigate gender differences in linguistic style. This pioneering work identified key phrases used by women, which include (amongst others) enhanced hedges and tag questions; since supported by a number of other researchers (Mulac & Lundell, 1986; Newman, Groom, Handelman, & Pennebaker, 2008). For example, Herring (1993) found that women ask more questions and include more supportive statements than males, whose language holds strong assumptions, bold statements and increased rhetorical questions. This aspect of linguistic style, which Lakoff termed 'women's language' is

thought to express tentativeness and uncertainty and has parallels to powerless speech styles.

Powerless language refers to a linguistic style dictated by enhanced hesitations, hedges, intensifiers, disclaimers, polite forms and tag questions, and is often associated with a stereotypically feminine language style. As a result, women are often perceived as less authoritative, credible, favourable and competent (Holtgraves & Lasky 1999; Mulac, Bradac & Gibbons, 2001). For example, Bradley (1981) found that a powerless speech style containing qualifying phrases (disclaimers and tag questions) negatively affected women's ability to exert influence and expertise during their arguments, despite powerless language used by men having no effect on the ability to assert the same arguments. Due to the perception that a powerless speech style is associated with feminine linguistic speech, it is assumed that females who deviate from this presumed style will be judged less likable and influential. Indeed, Carli, LaFleur, & Loeber (1995) found that women using tentative language were judged as friendlier by males compared to females who spoke assertively. However, other studies have reported no gender differences in the use of tentative language (Parton et al., 2002), reiterating the complexity of gender differences, often differing due to the methodology and analyses conducted.

Furrow and Moore (1990) contradict the power/powerless linguistic style research, noting that it is not simply that women use aspects of powerless speech style or have a lower status in society. Instead, women use phrases such as "I know" and "I think" to express confidence and certainty rather than tentativeness. Additionally, Carli (1990) reports that the use of tentative language by females works to increase persuasion within male communication partners. Yet for men, there was no significant linguistic difference in terms of influence over male or female partners.

Erickson et al. (1978) extended the literature and looked at the impact of powerful vs. powerless language in court room testimony using written and audio transcripts. They revealed that a powerful speech style resulted in higher ratings of attractiveness

irrespective of the gender of the speaker or subject. Additionally, greater perceived credibility was reported alongside greater acceptance of the position advocated during testimony, when compared to the powerless speech style; irrespective of gender of the subject and witness. Likewise, Holtgraves and Lasky (1999) reported that individuals who heard the powerful linguistic version of the same message were more likely to support and favour the recommendation proposed; irrespective of gender of either the speaker or participant. It implies that a powerless speech style does not represent female speech per se but rather individual differences and situational context (Blankenship & Holtgraves, 2005).

More recently, research has moved away from the gender-stereotypical powerless speech styles, investigating speech content between the genders and the role this has on credibility, persuasion and influence. For example, Newman et al. (2008) examined the nature of differences between gender in speech style by utilising LIWC software to analyse linguistic style at the rudimentary level of speech. They found that female language had increased use of pronouns, social words, negations and psychological processes. Additionally, the authors concluded that women use language to discuss individuals and reveal their intentions, as well as to communicate their thoughts and internal processes – supporting the idea that the primary goal for women during interactions is communal and emotional. Likewise, Hancock and Rubin (2014) found that females tend to express their feelings more during discourse by employing enhanced personal pronouns, negations and references to emotion compared to their male counterparts. Given this difference in gendered linguistic style, female language is judged as indirect, affective and elaborate (Mulac et al., 2001). This is in direct comparison to male linguistic style. Newman et al. (2008) found that the male linguistic profile consisted of increased word length, articles, prepositions, swear words and emphasised current concerns. The primary function of language for males is technical and task focussed, discussing topics such as money and football (Basow & Rubenfeld, 2003). As a result, the male stylistic preference for language is judged as comparatively direct, succinct and influential (Mulac et al., 2001). Indeed,

male linguistic style echoes a powerful speech style and thus invokes the confidence heuristic in receivers. For example, a male who is deemed confident, assertive, domineering and succinct is likely to invoke heuristic processing of the persuasive message or indeed bias an opposing female's systematic processing. Furthermore, if the male is the receiver, this would suggest reduced persuasive outcomes, with males invoking a defence-management motive in processing information from their communicative counterpart.

2.6 Summary of Chapters 1 and 2

This thesis concerns context, gender, ethnicity, cognitive and linguistic style. These concepts have been briefly described, critiqued and referenced in relation to persuasion outcomes throughout the literature review. Considering each of these variables with reference to the predominant dual process theories of persuasion described above, Table 1.1 (below) provides some tentative predictions as to persuasion outcomes as a function of each levels of the factor. These predictions will in turn contribute to the forthcoming hypotheses contained within the relevant chapters of this thesis.

To recap, the two persuasion models are very similar in the way they predict and outline the process of persuasive information (Two routes: One which requires greater cognitive thought, elaboration and critical thinking; One which is superficial, effortless and derived from previous experiences). The subtle differences between the two models lies in their processes and flexibility to which variables are incorporated. For instance, the HSM states that certain variables/ source cues are heuristic and thus specifically take the heuristic route, which even if motivated and able, can serve to bias or add to the ongoing systematic processing route. ELM on the other hand predicts that a cue can influence processing at any point along the continuum. For example, when elaboration likelihood is

high, the cue is elaborated upon and processed via the central route (which can serve to bias or validate).

Below are four elements of the dual process models which highlight the key differences in the two models (please refer to Figures 1.1 and 1.2):

1a. ELM hypothesise a continuum of elaboration that determines how persuasion unfolds.

1b. HSM propose that persuasion depends on continuum of judgmental confidence (the sufficiency principle).

2a. ELM states differences in motivation and ability influence elaboration and thus, the route of processing.

2b. HSM assume individuals are cognitive misers and the least cognitive effort is the preferred and often default route.

3a. ELM is only affected by accuracy whilst other motives serve to bias processing.

3b. HSM note accuracy, defence and impression management as motives.

4a. ELM highlight a trade-off is needed as one moves up or down the continuum.

4b. HSM routes can co-occur.

Table 1.1.

Variables described in Chapters 1 and 2, and their likely impact for persuasion outcomes as a result of the dual process models.

Gender	• Women will be more susceptible to persuasion by a male confederate than vice versa.

Ethnicity	• SA participants will be more persuadable than British participants. • Collectivist group (SA) more likely to be persuaded via heuristic route (to maintain ingroup harmony, less exposed to/taught critical debate and thought to interpret messages using tone and pitch of voice, body language and implied meaning to a greater extent) • Individualistic group (British) more likely to be persuaded when message engages in critical debate and logical reasoning.
Cognitive Style	• High scores on the two measures will lead to greater persuasion, earlier on in the discussion. • Higher NfCC/PDI-R scores predict a reliance on pre-existing heuristic biases and schema. Individuals are still guided by sufficiency principle and thus motivated by accuracy despite a desire for quick closure – meaning that if the sufficiency principle is not achieved prior to discussion (lack of concrete evidence) – they are more likely to be biased by consensus and readily available persuasive messages. Alternatively, if they achieve subjective sufficiency, it is likely they will be motivated by defence-management in order to achieve cognitive consistency.
Communication Modality	• Richer mediums facilitate greater availability of cues/evidence/heuristics and thus greater persuasion and sense of presence/immersion. • The greater the ability for multi-channel processing, the greater the persuasion outcomes. FtF easier to persuade due to the richer availability of heuristic cues to compliment (additive or bias) systematic processing. CMC restricts heuristic cues and can serve to negatively bias processing as participant's cognitive load increases (due to a lack of immediacy, clarification, and cognitive effort to transcribe and communicate persuasive thoughts). • Richer mediums (FtF) enable greater *ability* to elaborate and process multiple cues to inform decision. Longer discussion

	times and greater ability to convey arguments rapidly and without confusion enables greater elaboration, motivation and thus persuasion.
Linguistic Style	• Greater LSM with successful persuasion outcomes (greater rapport, mental engagement, similar thinking styles, successful negotiations) • Those who resist changing their verdict will have higher linguistic confidence and self-validation. • Expressed confidence will bias systematic processing.
Interactions	• SA females more likely to be persuaded than the opposing British males (who have higher power in language, dominance and less likely to be affected by restricted media due to their intentions and aims in conversations). • British will be less effected by restricted context (CMC) due to their focus on an argument's explicit meaning. SA participants however, will notice these restrictions to a greater extent and react negatively (reduced persuasion outcomes) given their preference for non-verbal and paralinguistic cues to inform decision-making. • Females in restricted medium will be negatively affected and thus less likely to be persuaded than richer mediums, compared to male counterparts. • Male speech will display higher epistemic modality and have a higher degree of drives and analytical thinking in speech leading to reduced persuasion outcomes compared to females, who will show greater degree of social and informal language, and lower rates of epistemic modality.

Note. Black font = general predictions. Blue font = HSM predictions. Green font = ELM predictions.

Chapter Three: Materials, General Procedure and Analysis Approach

3.1 Overview of Chapter Three

This chapter provides a description of the paradigm, materials, general procedure and analysis approaches for experimental chapters four, five and six of this thesis. The paradigm employed is consistent throughout, differing only as a function of environmental modality. Likewise, the mixed methods analysis outlined in this chapter is constant across the studies, designed to investigate the effect of gender, ethnicity and cognitive style on persuasion outcomes as a function of context.

3.2 Introduction

As outlined in the preceding two literature review chapters, increasingly people are communicating in synthetic digital contexts, for example, using immersive virtual environments (VEs) and computer-mediated technologies - moving away from traditional face-to-face (FtF) interactions in a global economy. Yet, psychological understanding of the effect of context on cognition, in particular the effect of DMs within which people communicate has yet to be fully explored for persuasion and information gathering purposes. Equally, a literature review has revealed significant gaps in understanding of the impact, or otherwise, of gender, cognitive style and ethnicity across digital contexts. Accordingly, this thesis concerns itself with the main effect of context, and the interactions of gender (male; female), cognitive style (as measured by the need for cognitive closure scale, and delusional thinking inventory), and ethnicity (British: South Asian) on persuasion outcomes.

The primary aims for this thesis are:

1. To investigate the effect of communication modalities on the persuasion process;

2. To investigate whether individual cognitive style mediates persuasion outcomes;

3. To understand whether gender and ethnicity affect persuasion when interacting in a dyadic conversation;

4. To understand the impact, or otherwise, of language during persuasive communication across contexts.

An overview of the three studies that make up this body of work, and how they interlink is illustrated in Figure 3.1 (overleaf).

Paradigm

This paradigm is used across all studies, comprising a between-subjects approach

Communication Modality

Study 1: FtF
Chapter 4

Study 2: CMC
Chapter 5

Study 3: VR
Chapter 6

Comparison study of 1, 2 & 3
Chapter 7

The Jury Method

Variables

Measured and manipulated across all 3 studies. Exception is cognitive style, which is analysed post-hoc

Gender
Male
Female
Mixed dyads

Ethnicity
South-Asian
British
Same dyads

Cognitive Style
PDI-R
NfCC
high or low

Mock-juror status
Participant
Confederate

Analyses (mixed-methods)

All methods are collected and analysed across all 3 studies

Qualitative
QCA of pre and post-discussion questionnaires

Quantitative
Parametric
Non-parametric

Linguistic style of jury discussions
LSM
LIWC
Epistemic modality

Figure 3.1   Persuasion in context: Overview of the research paradigm, empirical studies, variables of interest and analyses that make up this body of research

3.3 The Jury Method Paradigm (JM)

Traditional persuasion paradigms have generally manipulated persuasion using a one-way interaction process, typically in the format of an audio file, video file or a written statement (see Chaiken & Eagly, 1983). Participants are often seated and asked to listen or read a set persuasive message, with researchers measuring differences in attitudes before and after exposure to the message. It is through the presentation of structured arguments that researchers have been able to manipulate argument quality, likability of source, and context for example (e.g., Kelman, 2017; Petty, Briñol, Teeny, & Horcajo, 2018; Winter, Krämer, Rösner, & Neubaum, 2015). Direct observations of bilateral persuasion processes occurring in both the persuader and persuadee are rare, and so studies often lack the 'naturalistic' aspect of free-flowing conversation during the persuasive process. As a result, previous research has typically focussed upon a very singular line of measuring persuasion, excluding the interaction and debate element of the persuasive process (see Martin & Yurukoglu, 2017; Stiff & Mongeau, 2016; Winter et al., 2015).

The Jury Method (JM) is a long-standing and theoretically robust persuasion paradigm (London, Meldman, & Lanckton, 1970a & b; London, 1973) that allows free-flowing communication to occur and facilitates a measure of persuasion from both the persuader and persuadee perspectives during a dyadic interaction. Here, two individuals act as mock-jurors in a FtF context where they discuss the guilt or innocence of parties involved in a fictitious criminal event. Manipulation of opposing decisions (guilty vs. not guilty verdicts) are imposed prior to discussion (unbeknown to the mock-jurors) by manipulating the event information, which permits the observation of inevitable naturalistic persuasion in order to achieve a unanimous group verdict. In this situation, one individual typically becomes the persuader (maintaining their original verdict choice), whilst the other becomes the persuadee (changing their verdict post-discussion).

The JM consists of 3 distinct aspects which participants receive separately in the form of a 'jury booklet' prior to discussing a legal case. These include:

1. *The Jury Summary.* This 250-word summary outlined the key details of a fictional civil case of negligence. The authors reason this topic was chosen due to the majority of individuals not having a preconceived belief or opinion on the topic area. The case revolved around an airline company being sued for negligence by a lumber company. It states that faulty engineering resulted in a plane to crash, thus producing a fire which fuelled an existing fire to ultimately destroy the lumber company's timber.

2. *The Judge's Instructions.* The 100-word text informs participants of a lack of precedent for the legal case. Additionally, it points out that they will have to base verdict decisions on a preponderance of evidence, and not a 'beyond reasonable doubt' assumption.

3. *The Legal Analysis.* This section is manipulated to include arguments either for the plaintiff (the prosecution) or against (defence's statement), unknowingly prompting an initial agreement in participants to support the presented opinion and ultimately providing a primary disagreement with their jury partner. It does not differ in terms of evidence provided, but simply in opinions stated.

Once the jury booklet is administered, participants are given a verdict sheet, asking for their verdict choice (whether the airline company is or is not liable for the loss suffered by the plaintiff) and their confidence in this verdict, as a percentage. Upon subsequent completion, the participants are brought together and introduced. They are usually given 20 minutes to discuss the details of the case, acting as a two-man jury in an attempt to reach a unanimous verdict upon which they both agree.

Subsequent studies have used and adapted this paradigm, with larger sample sizes and confederates (Kruglanski et al., 1993; London et al., 1971; Webster & Kruglanski,

1994) and have repeated the findings of the initial research conducted by London et al. Furthermore, researchers (Kruglanski, Webster & Klem, 1993; Maslow et al., 1971; London et al., 1971) have extended this paradigm in an attempt to explain persuasion and persuadability using NfCC and confidence in communication; both of which will be discussed later on in this chapter.

3.3.1 Adapting the jury method. The JM was adapted for this programme of research by altering the scenario presented to participants and focusing on a contemporary cybercrime occurrence (see Appendix A). This update reflects current events, helping to ensure the persuasion scenario was engaging for participants. Domain-relevant analogues were created for the jury booklet by first identifying the relation-attribute structure of the source domain using Gentner's structure mapping theory of analogical problem-solving to guide the analysis (Gentner, 1983). This process ensured that the conceptual structure of the source domain used in previous research was retained in the new domain, so that complexity of the problem domains in terms of relational structure is maintained. This allowed for problem difficulty to be controlled for and the key concepts directly comparable to the original paradigm.

3.3.1.1 *JM adapted materials.* The jury booklet comprised a series of distinct sections, which will now be described in detail. The jury booklet is consistent across contexts and is presented to participants in the same manner irrespective of modality.

The case summary. The case summary outlines the details surrounding a fictitious criminal case briefly described here - a data storage company is charged with negligence because the company had not maintained a security firewall system thus allowing hackers to infiltrate the security network and steal a classified, highly-sensitive government document detailing key problems within the UK infrastructure. This document was

subsequently leaked to the press which caused public panic. The defence counsel claimed the hackers would have stolen the documents anyway, even if the correct firewall and protection were in place. The prosecution claimed the act of not maintaining the firewall lead to the illegal acquisition of the document, which was then leaked to the press.

The judge's instructions. The judge's instructions informed the participant that there was no legal precedent and that the verdict had to be either guilty and pay compensation, or not guilty and therefore not pay compensation; the issue of unanimity was stressed. The burden of proof required a 'preponderance of evidence', rather than the traditional 'beyond reasonable doubt' assumption. This reflects and references the original paradigm's instructions (London et al., 1970a).

Pre-deliberation questionnaire. After examination of the case booklet, participants completed a set of questions outlined in the pre-deliberation booklet. These included an initial verdict choice of either '*Guilty*' or '*Not Guilty*' and an initial indication of their meta-cognitive confidence in this decision, on a scale of 1-100%. Participants were asked to write down the key points they used to base their decision on, why, and if they ignored any evidence, to state this and why they chose to ignore it. Finally, participants were asked how credible they found the case summary, registering their thoughts on a 4-point Likert scale from '*not at all credible*' to '*very credible*' (See Appendix B).

Post-deliberation questionnaire. Following discussion of the case with a confederate, and once a decision had been reached, participants completed a post-deliberation booklet, similar to the first, whereby they were asked for their verdict choice and key evidence and points they used to base their decision on, and why. This allowed a direct comparison to be made, measuring differences in verdict choices (persuaded or not) as well as an assessment of the extent of their persuasion post-jury discussion.

In addition to the questions posed in the pre-questionnaire, the post-deliberation questionnaire asked how persuadable they thought the other juror member was, enquiring

if they said any persuasive and relevant points throughout the discussion. Likewise, an open-ended question asked how they found communicating with their jury partner (i.e., was it difficult or easy, and why). Finally, mock-jurors' were asked to rate their jury partner on a 5-point Likert scale for friendliness (ranging from '*very friendly*' to '*very unfriendly*') and aggressiveness ('*very aggressive*' to '*very passive*') to provide insight into possible factors that might contribute to persuasion. Previous research has suggested that subjective perceptions of personality/likability can influence compliance-gaining and persuasive processes (Rancer & Avtgis, 2006; Roskos-Ewoldsen, Bichsel, & Hoffman, 2002) and therefore these questions were included in the post-questionnaire outcomes (see Appendix C).

3.3.2 Piloting the adapted jury method materials. To understand whether this adapted version of the jury booklet was an unbiased and accurate adaption of the original paradigm, a pilot study was conducted. A within-subjects design was administered, whereby participants received both the original and the adapted jury booklets. These included both legal analyses so as to allow a single participant the full overview of the booklet's content to make an informed decision without prior manipulation. It additionally allowed the investigation of potential bias towards a favourable viewpoint when all evidence was presented to the participants.

Thirty participants were recruited using opportunity sampling, resulting in 13 males and 17 females, with a mean age of 31.80 years (*SD* = 13.81). The study was accessed online using SurveyMonkey, where individuals were provided with the participant information and asked for their informed consent. The first paradigm (original or adapted) was presented, followed by the second paradigm, which was counterbalanced. The booklet information was presented on screen, following which the survey asked individuals for their verdict choices and confidence in their decisions on a scale ranging from 1(*not at all*) to 10 (*completely confident*). Further questions were asked to probe an

understanding of participant's decision-making when reading and deciding their verdicts. These included: 1) What are the three main points you used to base your decision on? Please explain in as much detail as possible; 2) What are the three main points you disagreed with or did not influence your decision? Please explain in as much detail as possible.

Figure 3.2 (below) presents the key results from this pilot, indicating that the original JM booklet is heavily skewed towards a not-guilty verdict (80%) compared to the adapted version (58.6%). These results indicate that the adapted version is a more balanced summary of the evidence and does not directly influence participants to choose one particular verdict over another, based on strength or clarity of evidence. The adapted paradigm had a mean confidence score of 6.4 (out of 10) compared to 7 for the original. A dependent t-test revealed that participants were no more, or less confident in their verdict choices as a result of the jury booklet adaption, $t(29) = 1.35$, $p = .188$.
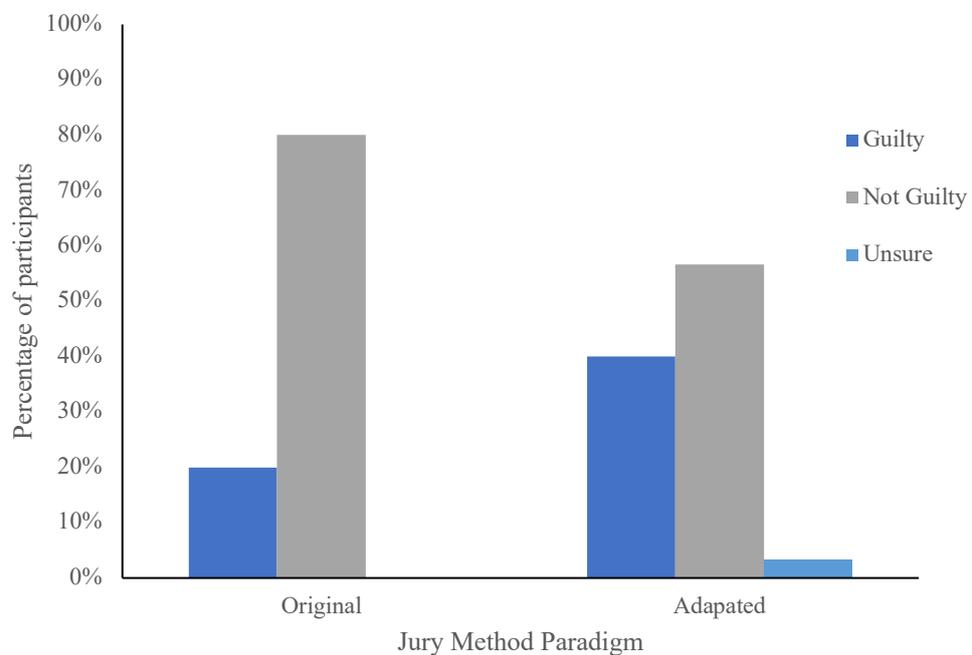
Figure 3.2. Verdict choice percentage across original and adapted jury booklets.

3.3.3 **Confederates mock jurors**. Two groups of participants were recruited for the programme of work presented in this thesis: confederates and mock jurors. Confederates were utilised for this research to experimentally manage the initial disagreement of verdict choices prior to the jury discussion. Using confederates negated the need for any pre-discussion manipulation of verdict choice and thus guaranteed an initial opposition of participant's verdict choice. This approach has been employed in previous studies of the JM, to good effect (Kruglanski, Webster, & Klem, 1993; London, McSeveney, & Tropper, 1971).

3.3.3.1 *Confederate juror training*. The pilot study had asked participants two open-ended questions to investigate their reasoning for choosing the verdicts (be it guilty or not guilty). The responses collected from this initial data collection was used to develop a script for the confederates that highlighted key points both for and against the legal scenario depicted in the jury booklet. The responses led to the development of alternative suggestions as to how to respond to participants during the jury discussion (see Appendix D).

All confederates were instructed that this script was simply a list of key points and they could expand on these points during the jury discussions in response to the mock juror's responses; the primary aim is to persuade the mock juror to the opposing viewpoint. Confederate jurors were also provided with a copy of the jury booklet and pre-discussion questionnaire, so any points brought up in jury discussions would be understood in context. All confederates were instructed to start the jury discussion by asking the participants for their verdict and thoughts on the case. This would then enable them to discuss the opposing, scripted points. All materials were made available to the confederates at least one week prior to the commencement of the study, along with the researcher's contact information if they had any questions. All mock jurors read the booklet and made a guilt/innocence decision that was communicated (secretly) to the confederate prior to

discussions, enabling them to enter the discussion with an opposing viewpoint. The mock juror was unaware of the confederate's status until the debrief was given.

3.4 Demographic Questionnaire

A demographic questionnaire was developed (see Appendix E1), comprising 11 items to collect information relevant to this thesis; ethnicity/cultural group, age, sex, educational status, level of completed education, country of birth, parent's country of birth, length of stay in the UK and first language. Here, ethnicity was defined as social traits within a population, such as nationality, religious faith and shared language, similar to culture but with an emphasis on racial roots (Betancourt, Green, Carrillo, & Ananeh-Firempong II, 2003; Verkuyten, 2018). Participants were asked to self-identify using categories consistently employed by the UN, World Bank Group, SAARC (South Asian Association for Regional Cooperation), Foreign and Commonwealth Office, and CIA Factbook (see Appendix E2). Ethnic/cultural grouping is complex because of the multifaceted, subjective and changing nature of ethnic and cultural identification, but sources from a variety of internationally-renowned, well-established organisations provide a 'gold standard' approach to collecting and grouping data of this nature. The nature of this research looks at the importance of multi-cultural societies such as the UK, and one of the UK's largest minority populations - the South-Asian community (Office for National Statistics, 2011). 'South-Asian' refers to individuals born, or first-generation migrants, from Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka. Those whose ethnic group did not fit into the classifications being investigated within this body of research (British, South-Asian) were excluded.

3.5 Need for Cognitive Closure

Need for Cognitive Closure (NfCC) scores were collected from all participants using the NfCC scale: a 42 item self-report measure designed to measure stable individual differences in NfCC (Kruglanski et al., 1993). NfCC uses a 6-point Likert scale (ranging from 1 *strongly disagree* to 6 *strongly agree*), with low composite scores indicating a low NfCC. The scale identifies five psychometric properties which include the desire for predictability, preference for order and structure, discomfort in ambiguity, decisiveness and close-mindedness. Previous research indicates these are reliable (Cronbach's α = .84) in that they significantly discriminate groups high and low in NfCC. Additional high test-retest reliability scores support the claim that the NfCC scale is stable construct (Webster & Kruglanski, 1994). A composite score is calculated by summing the responses across each item (after reverse scoring the appropriate items – see Appendix F) giving a possible range of 42-252. NfCC scores were neither manipulated nor controlled in the current research, rather they were used to investigate any potential relationship between persuasion outcomes, ethnicity, gender, and context.

3.6 Delusional Thinking

The Peter's Delusional Inventory – revised (PDI-R) is a measure of delusional ideation in the general population, using 21 items to assess unusual and subjective experiences (Peters, Joseph, Day, & Garety, 2004; Peters, Joseph, & Garety, 1999). The schizotypal subtypes include distress, preoccupation and conviction, which have been shown to provide greater discrimination between 'healthy' and deluded populations; that is not *what* you think, it is *how* you think about it (Peters et al., 2004).

Five separate scores are calculated, including the total across all dimensions. The first of these is the yes/no score (possible range of 0-21). For each of the 21 items, participants score either a 0 if the belief is not endorsed ('*no*') or a 1 if endorsed ('*yes*'). An

81

answer of '*no*' creates an automatic 0 for the following 3 subscales. However, a '*yes*' answer requires participants to rate their levels of distress, preoccupation and conviction on a Likert scale from 1 (*not at all) – 5 (very*). Each dimension is calculated by summing the scores within this subscale, producing a possible range of 0-105 for each factor. A grand PDI-R total score is derived by summing all 4 subcategories, resulting in a range of potential scores of 0-336 for each mock-juror. This average is useful for comparing individuals grouped as high or low, and is a robust and reliable measure of delusional ideation in the general population (see Peters, Joseph, Day, & Garety, 2004; Appendix G).

3.7 English Proficiency Measure

Participants in the research presented in this thesis were ethnically distinct, and so the Expressive One-Word Picture Vocabulary Test-Fourth Edition (EOWPVT-4; Martin & Brownell, 2010) was administered to all participants to control for potential confounding variables associated with language comprehension. The EOWPVT-4 measures the use of expressive (verbal) proficiency for English thereby ensuring that all participants were able to fully comprehend the various materials and instructions given and converse in English. EOWPVT-4 employs a picture-naming paradigm and asks individuals to name (using one word) the various objects, actions and concepts represented in colour illustrations, taking no longer than 20 minutes to complete and score. Standardised scores were computed, and a baseline established, whereby standardised scores for 99.7% of cases in the normal distribution fall between 55-145, thus making a score of below 55 the exclusion criteria for participants in this study. All participants scored above this baseline score, across all three studies and is therefore not discussed or analysed further.

3.8 Methodological Triangulation

'*An attempt to map out, or explain more fully, the richness and complexity of human behaviour by studying it from more than one standpoint*' (Cohen, Manion & Morrison 2007, p.141).

Methodological triangulation (sometimes referred to as mixed methods) involves collecting, analysing and integrating two or more research methods in order to study a single phenomenon or construct (Bekhet & Zauszniewski, 2012; Casey & Murphy, 2009). Combining multiple methods and empirical materials allows for a wider yet in-depth understanding of the research questions being asked (Foss & Ellefsen 2002; Olsen, 2004). This thesis focusses on concurrent triangulation, employing both qualitative and quantitative methods and analyses (Creswell, Plano Clark, Gutmann, & Hanson, 2003). This 'across-method' approach enables quantitative data collected to be complemented and clarified by qualitative findings; helping to identify key interests and concepts within the field of persuasion (Casey & Murhy, 2009).

3.9 Qualitative Methodology

The qualitative method employed for this research is self-reported, open-ended questions for mock-jurors prior to, and after the jury discussion (see the jury booklet). The rationale is to collect data on why/how individuals made their decisions, and how and whether this differs across persuaded groups, if at all.

3.9.1 Qualitative content analysis (QCA). QCA was used to systematically describe and quantify written data from the pre- and post-questionnaires. It is a mixed-methods approach: assigning categories and objective meaning to qualitative text to make valid inferences yet describing and analysing the frequencies of these categories using quantitative processes (Downe-Wamboldt, 1992; Mayring, 2014).

QCA involves understanding the surface structure of the materials selected and segmenting the transcriptions, allowing a clearer research focus and comparison of codes during analysis. In addition, QCA requires a coding frame for structuring material into thematic categories (dimensions) which specify relevant aspects, as well as subcategories, which specify relevant meanings concerning this aspect. The development and construction of a coding frame is underpinned by four key processes, all of which feed into an open coding approach which was utilised in this thesis. Open coding is a strategy for discovering concepts within the data, conceptualising the material by reading the text line-by-line.

QCA is a systematic procedure. Material is read multiple times, and as many headings or paraphrases as required are deduced and constructed in order to describe *all* content. This progressive summarising then requires a streamlining of the paraphrases based on a discernment of the relevant material. This is an inductive data-driven process as categories and themes emerge from the data and so are freely generated. A feedback loop enables the main categories (known as *dimensions*) to be revised and subsumed into a codebook using a hierarchical structure (see Figure 3.3).

A review of the literature reveals that thus far, there is no qualitative research for analysing persuasive interactive communications using QCA. As a result, this research aims to address this gap by complementing traditional quantitative methodology with inductive content analyses. The rationale for using QCA is to identify a broad yet condensed understanding of the processes influencing persuasion across different communication modalities.

PREPARATION
— — — — — — — — — —
Transcribe qualitative data
Select material for analysis
Surface structure understanding
Segmentation/Decide on research Q

CONSTRUCTION OF CODING FRAME
— —
(reductive process using open-coding to develop data-driven categories)

Generating & Conceptualising (1)
Decontextualisation of material
Identifying and generating category themes

Progressive Summarising (2)
Paraphrasing and streamlining category names and definitions
Defining content analytical units and values per dimension
Assigning rules to dimensions and subcategories and applying arbitrary codes

Structuring (3)
Arranging and developing hierarchical structure
Creating exhaustive and exclusive category systems per dimension

Refining & Revising (4)
Contrasting
Subsuming units and categories
Collecting anchor examples for clarity and replication
Evaluation, using consistency checks
Modify and revise coding frame as necessary

Redefine
Subsume
Delete

COMPILATION
— — — — — — — — — —
Finalise conceptual categories and coding frame
Re-code all material
Inter-coder, test-retest reliability checks

ANALYSIS AND INTERPRETATION
— —
Analyse frequency counts
Interpret underlying themes

Figure 3.3. Diagrammatic overview of the content analysis procedural model (QCA) used in this thesis, from planning to interpretation.

3.9.1.1 *Data corpus.* Data was collected using open-ended questions administered within the JM booklet, which investigated the subjective decision-making processes participants undertook when deciding on their verdict choices. Two primary questions were asked of mock-jurors': a) 'What were the main factors/evidence that you used to base your decision on – please list/describe them'. 'Please explain why you deemed these factors to be important'; b) 'What pieces of information/evidence did you not use to base your decision on? Please list them'. 'Please explain why you ignored these factors'. Additional questions probed mock juror's attitude to the communication and discussion with the confederate mock-juror. Participant's perception of the persuasive discussion is important in understanding the impact the interactions had on persuasion. How these conversations are perceived, and how individuals react to the confederate juror as a result can serve as a guide to modify and develop interactive persuasive procedures.

It is well documented that perceptions of others influences behaviour during interactions in a top-down fashion (Campbell & Cunnington, 2017; Firestone & Scholl, 2016). For example, Kahle and Berman (1979) found that attitudes have an important degree of predictive utility, whilst Chaiken and Eagly (1983) concluded that communicator salience influences the processing of persuasive messages, dependent on communication modality. Understanding how the participants felt immediately after the jury discussion is important when measuring and quantifying persuasive message exchanges across varying communication modalities. As a result, two open-ended questions were administered in the post-questionnaire; a) 'Do you feel your jury partner said some relevant and persuasive points? Please explain'; b) 'How did you find the discussion in general? For example, was it hard to communicate to your jury partner etc? Please explain'.

Finally, participants were given the chance to comment on the research as a whole, having the opportunity to add anything they deemed to be important that was not covered

in the set questions ('Is there anything else about this research, or your participation in it that you would like to discuss or comment on?'). All answers to these open-ended questions were transcribed across the three studies. In total, five detailed responses per participant were collected and analysed using QCA.

3.9.1.2 *Coding and development of codebook.* QCA has a number of requirements when establishing and refining a coding frame which needs to be taken into account when designing and analysing qualitative data. These include: 1) *Unidimensionality*, which requires that each dimension captures one aspect of the data corpus; 2) *Mutual exclusiveness*, which means that only one unit of coding can be assigned to just one of the subcategories within a dimension; 3) *Exhaustiveness*, referring to the requirement that all data should be assigned to one unit of coding within a subset of the coding frame; 4) and *Saturation*, meaning that all categories should be utilised at least once in the dataset, thus no categories are left empty.

To this end, a codebook for the current research was established (see Appendix H). Seven primary themes were identified from the data spanning two dimensions (pre- and post-discussion). These included:

1) Facts taken from the case file used to inform decision-making. This theme consists of 11 sub-categories

2) Reasoning for the verdict choice, containing 13 sub-categories.

3) Placement of responsibility for the crime depicted, containing 5 sub-categories.

4) References used to reason their verdict choice, constraining 4 sub-categories.

5) Persuasiveness of the confederate mock-juror, which was sub-divided into persuasive, not persuasive and neutral, containing 15 sub-categories.

6) Communication of the jury discussion. This was further sub-divided into communication with the confederate mock-juror, and perception of communication as a function of the communication modality covering 15 sub-categories.

7) Additional thoughts and details on the research study, covering 12 sub-categories.

For the first question on the pre-questionnaire ('What were the main factors/evidence that you used to base your decision on? Please explain why you deemed these factors to be important'), four codes are elicited per participant. These comprise a single code from themes 1, 2, 3 and 4. For the second question ('What pieces of information/evidence did you not use to base your decision on? Please explain why you ignored these factors'), two codes are elicited per participant from themes 1 and 3. Therefore, the pre-questionnaire prior to the discussion phase produces six codes for each participant, elicited from four themed headings.

For the first question on the post-questionnaire ('Explain why you think that the defendant is guilty/not guilty in as much detail as possible. Explain the main factors/evidence that you used to make your decision'), four codes are elicited per participant which is exactly the same as the four codes produced for the first question in the pre-questionnaire (comprising themes 1, 2, 3 and 4). The second question ('Do you feel your jury partner said some relevant and persuasive points?') elicits one code from theme 5. The third question ('How did you find the discussion in general?') elicits two codes from theme 6 which covers communication from the discussion as well as the modality. Finally, the fourth question covers theme 7 ('Is there anything else about this research, or your participation in it that you would like to discuss or comment on?') but can be extracted from any section of the questionnaire if relevant. In summary, the post-questionnaire produces eight codes. These are elicited from the above seven themed headings and apply to all participants. The points made for each participant were coded separately at both the pre- and post- questionnaire stages so a comparison of the changes in views could be analysed with regards to persuasion, cognitive style, ethnicity and gender.

3.9.1.3 *Inter-coder reliability.* Two independent raters, blind to the research design and hypotheses underwent training sessions. This involved understanding the JM paradigm, the definitions of the codebook, and how the coding scheme is applied to the qualitative transcripts. Following this, each coder completed practice transcripts which were then compared sentence by sentence to the researcher's codes, and feedback was given where needed. Interrater reliability, measured through Cohen's κ, was calculated from a random sub-sample of 21 participants spanning all three communication modalities and independent variables. Results indicated that all themes were rated in the highest band of agreement ($M = 0.929$, $SD = 0.69$; see Table 3.1), indicating that the coding scheme was reliable and consistently applied.

Table 3.1

QCA reliability testing from two independent raters ($N = 21$)

Theme No	Pre Deliberation Themes	κ
1	*Facts used to inform decision-making*	0.819
2	*References*	1.000
3	*Reasoning for verdict choice*	0.866
4	*Attribution of responsibility*	1.000
5	*Facts not used in decision-making*	0.869
6	*Reasoning for not using evidence*	1.000
	Post Deliberation Themes	
7	*Facts used to inform decision-making*	0.888
8	*References*	1.000
9	*Reasoning for verdict choice*	0.940
10	*Attribution of responsibility*	0.924
11	*Persuasiveness of the confederate*	0.825
12	*Communication of jury discussion*	0.943
13	*Additional comments*	1.000

Note. All p's < .001

3.10 Overview of Quantitative Analyses

A primarily quantitative approach is used throughout this thesis, allowing decisions and behaviours to be systematically quantified and measured. Prior to reporting the results in full, the following provides a brief overview of the analysis approaches employed on the research data throughout this thesis, and how the methods used support an in-depth analysis of persuasion.

3.11 The Jury Method Analyses

First, persuasion outcomes were considered using the pre- and post-discussion self-reported questionnaires, whereby participants indicated their verdict choice of either 'Guilty' or 'Not Guilty'. A change in verdict post-discussion indicated persuasion had occurred. This categorical data was analysed using non-parametric Chi-Square statistical tests, permitting a comparison of proportional indicators of persuasion as a function of the sample as a whole, and across experimental manipulations.

Analyses of variance (ANOVA) were used to investigate differences in confidence of verdict choice, both before and after the jury discussion as a function of Persuasion, Ethnicity and Gender. Confidence in verdict choice was gleaned from the pre- and post-questionnaires given to mock-jurors', using a percentage scale of 0 (*not at all*) - 100% (*very*).

Percentage change in confidence was calculated to determine the degree of confidence change as a result of the jury discussion. This was calculated using London et al.'s (1970b) computations, taking the confidence indicators from the pre- and post-mock-juror questionnaires and calculating a single change score, to allow a direct comparison across groups, irrespective of changes in verdict (see Section 3.11.1). The confidence

percentage change scores are analysed using relevant inferential statistical analyses across Persuasion, Ethnicity, Gender and Cognitive Style. Chi-Square Goodness of Fit tests determine the direction of confidence change scores for significant ANOVA results.

Two cognitive style measures were calculated and analysed (PDI-R & NfCC). Descriptive statistics are reported, following which analysis of variance tests were used to analyse the distributions of scores collected, and to investigate whether the distributions differ significantly across the unrelated conditions of Gender, Ethnicity and Persuasion. Both cognitive measures were also used to categorise mock-jurors as either high or low in their cognitive style if they fell within the first or final quartile emerging from the range of scores collected. The resultant dichotomous data was analysed across a range of dependent variables (DVs) including confidence in verdict choices pre- and post-discussion, the change in percentage confidence and the duration length of the jury discussion. To investigate whether there was a relationship between the two cognitive style measures, a correlation was additionally computed.

To determine whether the length of the jury discussion between mock-jurors and confederate mock-jurors impacted on persuasion outcomes, and whether the experimental variables influenced discussion length, the duration of the jury discussion was calculated by the number of seconds from the experimenter leaving the testing lab, to a verdict being agreed upon (whether that verdict be unanimous or disputed). Analysis of the means across the experimental variables including Persuasion and Cognitive Style was also analysed.

The language of verbal speech during the dyadic jury deliberation was analysed. Transcripts were transformed into files suitable for linguistic style analysis using Linguistic Inquiry and Word Count software (LIWC: Pennebaker, Booth, Boyd & Francis, 2015). This is a text-based analysis system that allows speech to be broken down into psychologically meaningful categories. It provides some insight into the cognitive and perceptual processes of the mock-jurors during the dyadic jury discussion (see Section

3.12). From this database, Linguistic Style Matching (LSM) is calculated allowing insight into the synchronicity of mock-jurors linguistic style when interacting with the confederate mock-juror (see Section 3.13).

Qualitative data is collected from pre- and post-discussion questionnaires, whereby participants were given a series of open-ended questions regarding why they chose the verdict they did, evidence they decided to focus on/ignore, any relationship between those persuaded vs. not, and changes in participant's focus of key data, along with responses to open-ended questions. This allowed consideration of persuasive comments and communication ease to give some insight into subjective opinions of the confederate persuasiveness compared to those who were not persuaded.

Finally, the influence of the confederate on the dyadic discussion was investigated using a series of non-parametric Mann-Whitney U tests using the mock-juror's rankings of confederate's friendliness and aggressiveness. These data emanated from 5-point Likert scales as a function of Gender, Ethnicity and Persuasion. Finally, the confederate's speech when discussing the case with the mock-juror participants is transcribed and analysed using LIWC and LSM analyses to compare linguistic style across the various variables to mock-jurors.

3.11.1 Percentage change in confidence and persuasion. Every mock-juror participant was asked to give his opinion twice (pre- and post-discussion). From this comparison, two principal measures of persuasion were collected and analysed: opinion change (persuasion) and the degree to which opinion differed post-exposure to persuasive messages (percentage confidence change). Persuasion, whereby an individual changes their opinion following the jury discussion or sustains their initial decision, consists of a binary assignment of either yes or no (coded as '1' for persuaded or '0' as not persuaded).

The change in confidence from pre- to post-discussion verdict was analysed to investigate any differences in subjective confidence ratings when persuasion had occurred. This is simple to calculate for an individual who was not persuaded and therefore did not change their verdict. The pre-confidence rating is subtracted from the post-confidence rating, as illustrated below. In this example (Figure 3.4), the participant's initial pre-decision verdict was *not guilty*, indicating a 60% confidence in that decision. Post-discussion shows the individual was not persuaded, but confidence of their original verdict increased, stating 80% for *not guilty* post-discussion. This results in a percentage confidence change score of 20%: an increase in confidence of verdict choice post-jury discussion.
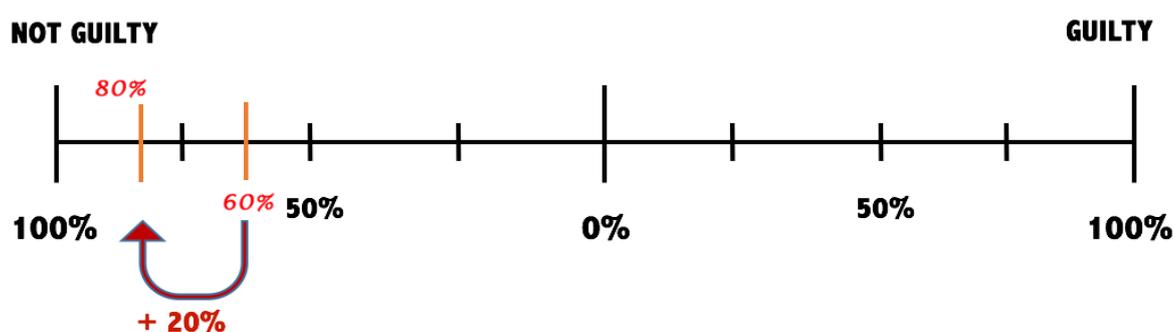
Figure 3.4. Illustration to show the percentage change score calculation for an individual who was not persuaded.

However, a problem arises when comparing confidence in verdicts for those who *were not* persuaded and did not change their verdict decision, and those who *were* persuaded and therefore rejected their previous verdict. In such instances percentage change scores cannot be effectively compared as one group changed their verdict choice and one group did not. To allow a reliable and absolute measure for comparing percentage *change* in confidence for mock-jurors who were persuaded versus those not persuaded, the following calculation was used (see London et al., 1970b):

PostC – X = Percentage Change Score

(X = 100 – PreC)

where PreC is the pre-verdict confidence and PostC is the post-verdict confidence.

In this example, (as Figure 3.5 illustrates) the participant was initially 60% confident in their pre-verdict choice of *not guilty*. However, after the discussion, they changed their verdict to *guilty* and this resulted in a confidence in the new verdict of 30%. By calculating 100 minus the pre-discussion confidence in the ultimately rejected verdict, this allows an absolute score to be derived. Stating a confidence of 60% is the reverse of stating you are 40% confident in the opposing verdict. Consequently, this results in having a percentage change score of -10%: a reduction in absolute confidence by 10%. Using this calculation allows the two confidence change scores across persuasion groups to be directly compared.
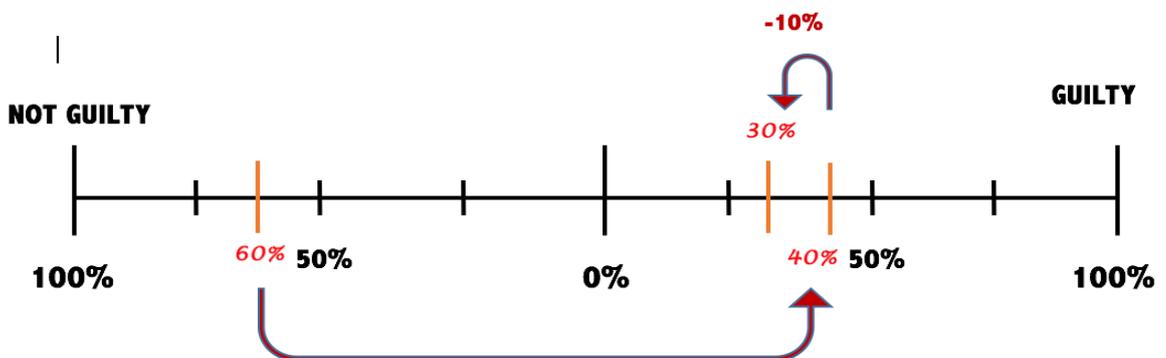
Figure 3.5. Illustration to show the percentage change score calculation for an individual who was persuaded.

3.12   Linguistic Inquiry and Word Count (LIWC)

LIWC, developed by Pennebaker and colleagues (Pennebaker, Booth, & Francis, 2007; Pennebaker, Boyd, Jordan, & Blackburn, 2015; Pennebaker, Francis, & Booth, 2001), is a computerised text-analysis program which enables word-by-word analysis of multiple linguistic files to efficiently quantify language (Boyd & Pennebaker, 2015; Newman, Groom, Handelman, & Pennebaker, 2008; Pennebaker, Chung, Ireland, Gonzales, & Booth, 2007). LIWC consists of both content and style words. *Content words* include nouns, regular verbs, adjectives and adverbs which convey the content of information in speech. *Function words* on the other hand, are what binds speech together and consist of pronouns, prepositions, articles, auxiliary verbs and conjunctions. LIWC has been found to be reliable and used effectively across a number of psychological studies (Tausczik & Pennebaker, 2010).

3.12.1   Linguistic style during jury discussion. To calculate the linguistic content for each individual, discussion transcripts were separated into utterances for mock- and confederate mock-jurors', creating two separate files for each jury discussion (394 files in total). Each transcript was checked for spelling errors and adapted to accommodate for spoken language, in line with the LIWC2015 manual. For example, starting words with '*rr*' if it is to be classed as a non-fluency, or contracting words such as '*youknow*' to ensure categorisation as a filler item. Transcripts were scanned for target words using the LIWC software system, and compared to each word in the default LIWC dictionary. Appropriate word categories and subcategories are then incremented, meaning that one word can create more than one LIWC output. For example, the word 'cried' would be categorised under 'sadness', 'negative emotion', 'overall affect', 'verb' and 'past tense verb'.

Paralinguistic dimensions allow for conversational analyses within studies, including 'netspeak' which comprises shortened text-phrases and basic emoji's ('b4', which is coded as a preposition; '☺', which is coded as a positive emotion subcategory).

This supports a crude measurement of text-speak (relevant for Study 2). LIWC output is expressed as the percentage of total words in the text sample submitted per individual, with five exceptions in the summary categories: word count (WC), analytical thinking, clout, authentic and emotional tone. The resulting percentage score thus permits a profile of the individual's linguistic style.

Four summary variables were included in the analyses for linguistic style in the current body of research. These included analytical thinking, clout, authenticity and emotional tone. Six linguistic themes of interest were also included, which comprised of total function words (including pronouns, articles, prepositions, auxiliary verbs, adverbs, conjunctions and negations), affective processes (positive and negative emotions, anxiety, anger and sadness), social processes (family, friends, female and male references), cognitive processes (insight, causation, discrepancy, tentative, certainty and differentiation), drives (affiliation, achievement, power, reward and risk) and informal language (swear words, netspeak, assent, nonfluencies and fillers).

3.12.2 Epistemic modality: A new LIWC dictionary. Epistemic modality influences the perception of confidence within speech, and so can influence the degree of persuasion across varying communication modalities. In order to analyse epistemic modality within participant's linguistic style, a new dictionary was created to be subsumed into the LIWC software. The word stems were directly derived from past studies (Kärkkäinen, 2003; Leech & Svartvik, 1975; Maslow et al.,1971; Quirk, Greenbaum, Leech, & Svartvik, 1985; Wesson, 2005), combining research across language power, dogmatic style, expressed confidence and meta-cognition to form a comprehensible and logical measure for assessing epistemic modality both within speech and text formats. Tentative language was compiled using a number of unique language features that indicate uncertainty and low confidence. Examples include hedges (e.g., might, sort of, maybe, probably; Wesson, 2005), epistemic stance verbs, adverbs and modal verbs (e.g., 'should'

is a weaker equivalent of 'must' highlighting the non-committed tendency of the speaker or a tentative inference: Leech & Svartvik, 1975; Quirk et al., 1985). A confident linguistic style, on the other hand, includes expressions of certainty and expressed confidence derived from the same studies but appearing at the other end of the continuum (e.g., 'certainly', 'will', 'need', 'believe', 'definitely'). Furthermore, coding of jury discussion transcripts facilitated additional inclusion of epistemic modality word stems which could be considered specific to the JM context, such as 'I am leaning both ways', and 'but then' which highlights indecisiveness, changing of opinions and thus doubt in self (see Appendix I).

3.13 Linguistic Style Matching (LSM)

To examine the synchronicity of linguistic styles between the mock- and confederate jurors' during the persuasive dyadic interaction, linguistic style matching (LSM; Ireland & Pennebaker, 2010; Niederhoffer & Pennebaker, 2002) was employed. LSM utilises LIWC outputs to examine the data corpus for each individual's utterances within the JM discussion, specifically calculating the amount of words that fall into nine specified categories (auxiliary verbs, articles, common adverbs, personal pronouns, indefinite pronouns, prepositions, negations, conjunctions and quantifiers) for each individual (see Table 3.2). These categories measure the synchronicity of function words to the other conversational partner throughout the course of the recorded conversation. Function words reliably reflect a speaker's psychological state and tend to be processed rapidly and largely subconsciously (Ireland & Henderson, 2014). This indicates that LSM scores reflect unconscious synchronicity between conversational partners, rather than deliberate intention. Previous studies have utilised LSM as an analysis method for dyadic interactions and across communication modalities. For example, examining romantic interest and stability between couples (Ireland et al., 2011), and investigating whether LSM

is a predictor of cohesiveness within asynchronous CMC and FtF environments (Gonzales, Hancock, & Pennebaker, 2010).

Table 3.2

The 9 function categories collated from LIWC2015 and used in the calculation of the LSM score, along with definitions and exemplars

Function Category	Definition	Linguistic example
Adverbs	Describes or gives additional information about a verb, adjective or phrase	Very, well, gently
Articles	References a noun	The, a, an
Auxiliary verbs	Adds functional or grammatical meaning to a clause	Shall, have, do
Conjunctions	Connects clauses or sentences	And, but, therefore
Indefinite pronouns	Pronoun which does not refer to a specific being, object etc.	Something, anything, it,
Negations	Contradiction or denial	No, not, nobody
Personal Pronouns	Reference to a specific person	I, me, we
Prepositions	Show a relationship in space or time or between a person, object or place	Down, opposite, around
Quantifiers	Denote size, scale or amount	Many, few, much

The following formula is taken to calculate an individual's LSM score across each of the 9 categories:

$$\text{LSM}f \; = \; 1 - [(|f\text{m} \; {-}f\text{c}|) \; / \; (f\text{m} + f\text{c} + .0001)]$$

where '*f*' is the function category, 'm' is the individual's LIWC score for that particular function category, and 'c' is the opposing discussion partner's LIWC score for the same function category (in this case, it would be the confederate-mock-juror). The denominator of .0001 is used to prevent division by zero (see Ireland & Pennebaker, 2010). The resulting 9 scores for each jury discussion are averaged to provide a total LSM score for each discussion between mock-juror and confederate mock-juror. LSM scores vary between .00 and 1.00 whereby the higher the score, the greater the LSM between the two speakers. Analysis of function words in this way can determine the level of linguistic style matching which occurs at a subconscious level, whereby the function categorised denote *how* communication is occurring, rather than *what* is being said (content words) and have been found to correlate with behaviours such as social bonding and dominance (Tausczik & Pennebaker, 2010).

3.13.1 LSM over time. To investigate whether persuasion outcome was systematically related to changes in LSM over the course of each interaction, the length of the dyadic discussions were divided into quarters, based on the word count within each dataset. Word count was used as a basis for comparison as it allowed automatic delineation within statistical and LIWC software systems. In addition, it allowed for direct comparisons to be made between dyadic discussions regardless of discussion length. Four time periods were chosen as previous research indicated further division of utterances may reduce the ability of the analysis to identify meaningful patterns of change in an individual's word use (London et al. 1970a; Taylor & Thomas, 2008).

3.14 Ethics

All of the research presented in this thesis was the subject of ethical scrutiny by the Ministry of Defence Research Ethics Committee (MoDREC), the University of Wolverhampton Ethics Committee and the University of Westminster Ethics Committee. The research was ethically cleared by all of the above committees and was run in accordance with the British Psychological Society ethical code of conduct. Accordingly, participation was entirely voluntary, and participants could withdraw at any time. All information was anonymous, and contact details were kept confidential. All participants (including confederates) were first provided with an information sheet (Appendix J) and consent form (Appendix K) which they read and signed, having had the opportunity to ask questions. Information about the research project and what would be required was provided, but all participants were naïve to the experimental aims and hypotheses.

Questionnaires presented online (in studies 2 and 3) via Survey Monkey gave the information sheet on the first page. Before completing the questionnaire, participants were required to read and consent to the research and the survey did not allow those who did not consent to further view or compete the questionnaires. There was no risk to participant's health or psychological well-being regarding stress, worry or embarrassment. All FtF and VR discussions were video and audio-recorded, whilst the online CMC study was text-copied and monitored in real-time; the researcher being on hand and available throughout all three studies. All participants were referred to using their unique participant number, with all recordings kept on a password-protected hard-drive which only the experimenters' had access to. All hard-copy data used participant numbers and were stored in locked cabinets in a secure office at the University of Westminster/Wolverhampton whereas identifiable information obtained through consent forms and demographic questionnaires

were either stored on a separate password protected hard-drive, or in a separate, securely-locked cabinet.

Upon completing the research, participants were given a debrief sheet which highlighted the use of a confederate, and asked for their informed consent, again highlighting their ability to withdraw and ask the researcher any questions (Appendix L). The experimenters' email addresses were also provided if the participants had any questions once the study had finished.

Chapter Four: The Dyadic Face-to-Face Modality (Study 1)

4.1   Overview of Chapter

This chapter reports the first of three empirical studies. Here culture, gender, cognitive style and persuasion are investigated in a traditional face-to-face context (FtF) thereby providing a baseline for understanding persuasion across novel contexts (Chapters 5 and 6) and the relative impact, or otherwise, of culture, gender and cognitive style. This chapter expands on previous research by investigating persuadability in mixed-gender, same-ethnic dyads, as well as measuring cognitive and linguistic style through a variety of methods and analyses, mentioned in the previous chapter.

4.2   The Jury Method (JM) paradigm

The cognitive approach to persuasion (Greenwald, 1968) claims that when individuals perceive and respond to persuasive communication they will attempt to relate the new information to existing topic knowledge and schemas. Cognitive processes refer to the processing of information via perceiving, judging, elaborating and recalling from memory (Posner, 1973). The receiver is not passive, but instead uses information to construct opinions and anticipate communication (Brock, 1967). Lewin (1947) found that when individuals were given a persuasive communication in a passive style (lecture), only 3% were persuaded. However, when the same message was presented in an active group discussion, persuasion jumped to 32%. Interacting and engaging with the persuasive message has a more positive outcome on changing a person's decision than a passive style of reading or watching (also see Hiraoka, Neubig, Satki, Toda, & Nakamura, 2016). Referring to the working definition of persuasion outlined in Chapter 1, persuasion is an interactive communicative process, social in nature. Individuals look to others for advice and elaboration before a final decision and attitude is formed (Dainton, 2005; Perloff,

2003). And yet research often relies upon video or written messages to deliver persuasive unilateral arguments (see Petty & Cacioppo, 2012 for an overview of persuasive methodology and its recent development). The JM paradigm allows for a bilateral exchange between conversational partners, infrequently seen within the persuasion literature.

4.3 Ethnicity

Differences in cognitive style and decision-making across cultural groups has been demonstrated (albeit sparsely) within the persuasion literature. For example, Nisbett et al. (2001) found that East Asians were more holistic in their reasoning, attending to the 'bigger picture' compared to Westerners, who were more analytical and preferred to include formal logic in their reasoning. Nisbett argued that these are differences in the nature of Asian and European thought processes. However, research has typically focussed on the extreme ends of Hofstede's cultural dimensions (East Asian v. Caucasian American, Hofstede, 1980; 2011) which are being revised in light of emerging cultural data emanating from a more contemporary multicultural society (see Minkov, 2018).

The study reported in this Chapter (in addition to Chapters 6 and 7) will extend the current literature by focussing on two ethnic groups - South Asian and British - selected to convey new differences in the spectrum of Ind/Col to understand whether such dimension scores still hold in a society which is increasingly multi-cultural. Interestingly, there is still a consensus that individualistic cultures tend to place a greater emphasis on autonomy, compared to collectivist cultures who aim for group harmony and connectedness, and so it was hypothesised that the South-Asian group will show greater levels of persuasion post-jury discussion compared to the British sample.

4.4 Language

Cohesiveness of language has been linked to successful negotiation outcomes where an agreement has been achieved (Ireland & Henderson, 2014). Research has suggested that participants who have a high level of rapport mimic one another's linguistic style (Tickle-Degnen & Rosenthal, 1987; 1990) increasing liking and positive perceptions. For example, successful hostage negotiations have greater coordination of linguistic style compared to unsuccessful ones (Taylor & Thomas, 2008). In turn, this implies that higher aggregate LSM scores could feasibly be associated with successful persuasion outcomes.

Epistemic modality refers to the evaluation of chances. Individuals often qualify statements on an epistemic continuum, ranging from absolute, high, moderate, low certainty and uncertainty (Rubin, 2010). Once again, the literature lacks consistency in manually annotating and automating the identification of statements which explicitly express certainty and doubt. This is perhaps due, in part, to the wide variety of ways to measure confidence in speech. Confidence can cover a wide variety of linguistic styles, each of which have been separately investigated and manipulated in past research. This includes language power, dogmatic style, expressed confidence and meta-cognition. Expressed confidence, for example was researched using a unilateral version of the JM paradigm. Maslow et al. (1971) found that expressed confidence increased persuasion leading to participants changing their verdict choice, compared to transcripts which enhanced doubt. The current thesis combines these areas of epistemic modality to measure post-hoc the relationship between persuasion and confidence. It is predicted that participants not persuaded will express higher linguistic confidence in the jury discussions.

The nature of language is complex, and this thesis simply aims to lead discussion. One specific area which it aims to highlight is gender and linguistic style. There are differences in the use of linguistic styles across genders - men use a more direct, succinct and influential style compared to women, who prefer to elaborate and support their communal goals (Mulac et al., 2001). As a result, it is possible that linguistic style (both in

terms of LSM and LIWC outcomes) and thus persuasion outcomes will differ in relation to gender, albeit that the direction of this difference is unclear.

4.5 Gender

As outlined in Chapter 2, past research has suggested that males and females portray differences in interactive styles and behaviours during communication. A male-dominated style of interaction (considered to be more dominant, rational and aggressive) is utilised when attempting to overtly influence a partner (despite that individual being male or female; Carli, 1989). Carli (1990) expanded on this research, finding that women are less likely to persuade a conversational partner due to a dislike for female disagreement. However, a lot of the gender research is decades old and is therefore not an accurate reflection of current society changes. Nevertheless, given the available literature, it is sensible to expect that males will be less persuaded by a female confederate than vice versa.

Furthermore, language is a medium in which findings have shown gender differences in linguistic styles. For example, women are thought to be sensitive to overconfidence but likewise show a dislike to men who displayed low confidence during speech (Wesson & Pullford, 2009). In other words, men and women who express the same level of confidence can be perceived differently (e.g., assertive, knowledgeable, overly-confident, unlikeable) which as a result, influences reasoning and persuasion outcomes. It is therefore prudent to investigate gender on linguistic style and persuasion outcomes. Linguistically, it is likely that male speech will display higher confidence and an individualistic style (swear words, increased word length) compared to females, who are believed to prefer to form a communal bond and thus display less overt confidence and a

more holistic style of speech (increased pronouns, negations and reference to psychological processes).

4.6 Cognitive Style

Jumping to conclusions and becoming 'closed off' to further discussion once an opinion has been formed is the hallmark of scoring highly in cognitive style measures of delusional thinking (PDI-R) and the need for cognitive closure (NfCC). Given the relevant literature introduced in Chapter 2, it could reasonably be argued that scoring highly on these measures would lead to reduced persuasion in the JM paradigm because participants will have stated their initial verdict prior to the persuasive discussion, thus achieving their NfCC. Alternatively, a high score in these measures could also indicate a propensity to be more persuadable early on the jury discussion. The JM paradigm is deliberately written to be indefinite and allow for alternative verdicts to be reached. As a result, some participants may feel that they have failed to reach adequate, systematic closure due to a lack of concrete evidence. Thus, exposure to persuasive arguments during the jury discussion might lead to a jumping to conclusions bias, thus achieving cognitive closure by changing their verdict choice once alternate views are aired. Accordingly, scoring highly in NfCC will correlate to scoring highly in delusional thinking, demonstrating the relationship between these two elements of cognitive style.

4.7 Qualitative Content Analysis (QCA)

Finally, content analysis is employed to explore the reasoning behind the decisions made, and the influence this might have on persuasion. Additionally, if gender, ethnicity and cognitive style interplay with reasoning and post-discussion reflection. For example, whether females focus more on the individual being prosecuted (rather than the company) compared to males; whether males have an increased focus on the facts and evidence

disclosed; or whether individuals high in the NfCC stick to the evidence initially provided, or use the discussion to expand their reasoning?

4.8 Study One Hypotheses

Given the available literature previously introduced, a series of tentative hypotheses were formulated:

1. South-Asian participants will show greater persuasion post-jury discussion compared to British participants;
2. Females will be more persuadable when interacting FtF with a male confederate;
3. South-Asian females are more likely to be persuaded than British males given predictable differences in language, power and confidence.
4. There will be a relationship between cognitive style and persuasion outcomes;
5. Male speech will display higher confidence and an individualistic style (e.g., swear words, increased word length) compared to females which will lead to reduced persuasion outcomes;
6. Participants expressing higher confidence (expressed linguistically and through measurements of meta-cognitive percentage confidence via pre-and post-questionnaires) will be less persuadable;
7. Linguistic style (both in terms of LSM and LIWC outcomes) will differ as a function of gender and persuasion outcomes.

4.9 Method

4.9.1 Participants. Sixty-six mock-juror participants took part in this study, comprising 17 British males, 16 British females, 16 South-Asian males and 17 South-Asian females. Of the British sample, 32 self-reported their ethnicity as English (97%),

whilst 1 participant stated they were Scottish (3%). Of the South-Asian sample, 23 reported their ethnicity as Pakistani (69.7%), 9 as Indian, (27.3%), and 1 as Bangladeshi (3%). All South-Asian participants reported being either foreign-born or first-generation immigrants to the UK. Mock-jurors' ages ranged from 18 to 52, with a mean of 24.00 years ($SD = 7.86$). Four students from the University of Wolverhampton (1 male and 1 female from each cultural group) were recruited as confederate mock-jurors with a mean age of 21.0 years ($SD = 0.82$), ranging from 20 to 22 years. Mock juror participants were recruited via the University of Wolverhampton's SONA system and opportunity sampling in the local community. Psychology students were given course credits for their participation. Mock jury participants from the local community were paid £10.00 for their time. The confederate juror participants were paid £5 per mock juror for participating in the research.

    4.9.2   Design. A between-subjects' experimental design was employed with two independent variables, i) Ethnic group with two levels (South-Asian; British), and ii) Gender with 2 levels (male; female). All dyadic discussions occurred in mixed-gender dyads: male confederate juror & female mock juror, or vice versa. The dependent variable was persuasion, measured by each mock juror completing a pre-and post-dyadic discussion self-report questionnaire for verdict choice and percentage confidence change (Appendices B & C, also see materials below). Linguistic and cognitive style were not manipulated, rather these measures were collected from participants to investigate their effects/relationship with persuasion outcomes. Cognitive Style consisted of two measures (PDI-R and NfCC) with 2 between-factor levels: high (scoring within the top 25% quartile) or low (bottom 25% quartile), taken across all FtF data. Linguistic style was measured using LIWC software outputs, consisting of both confederate and participant contributions to the jury discussion, in addition to using this data to ascertain LSM and epistemic modality (which has two levels: doubt and confidence).

4.9.3 Procedure. Mock Juror participation for this study comprised of two sessions (session 1 and session 2), whereas confederate juror participation necessitated attendance at just one experimental session (session 2).

4.9.3.1 *Mock-juror session 1.* Session 1 comprised an online survey conducted via SurveyMonkey, containing an information sheet (see Appendix J), and participants were given the opportunity to ask questions prior to agreeing to participate in the study (delivered via email) after which they were asked to confirm their consent (see Appendix K. Having given consent, all mock jurors then completed the Demographic Questionnaire (see Appendix E1) the Need for Cognitive Closure scale (see Appendix F) and the Delusional Thinking Inventory (see Appendix G), which took approximately 20 minutes to complete. Participants made arrangements to attend session 2 in a comments box.

4.9.3.2 *Mock-juror session 2.* Upon arrival at session 2, participants were once again given the information sheet to remind them of the aims of the research, and what would be required of them in session 2. Participants were asked to complete a second consent form for session 2 and were offered the opportunity to ask any additional questions before beginning. Session 2 commenced with the English Proficiency Measure (see Martin & Brownell, 2010) to establish English ability and ensure parity across groups before the Jury Method (JM) paradigm was administered.

The JM consists of two members of a dyad, each given the essentials of a legal case (London, Meldman & Lanckton, 1970a). This includes a summary of the case, the judge's instructions on how to convict, and a legal analysis. Pairs also fill out pre- and post-discussion verdict sheets, asking for their verdicts (pre and post) and confidence in these verdict choices. Each mock juror read the booklet alone, following which he/she completed the pre-discussion sheet, which recorded their initial verdict and thoughts concerning the

case to be used as a baseline measure. Once complete, the mock-juror was escorted into the same room as the confederate, and the two individuals were seated opposite each other (the mock-juror was ignorant of the fact the other participant was a confederate). The researcher then instructed both to deliberate the case they had just been presented with and emphasised the need to reach a unanimous decision. The discussion was limited to 20 minutes (which the researcher made clear to the participants would be enough time). Jurors were informed that the researcher would leave the room whilst they discussed the case so as to reduce unwanted interference and resemble a realistic jury discussion. At this point, the researcher switched two video cameras on (recording both the confederate and mock-juror) to evidence their discussions.

When the deliberations had finished, the confederate mock-juror was led out and the mock-juror was asked to complete the post-discussion sheet on the pretence that the confederate was doing the same in the room next door (See Appendix C). Completion of the questionnaire marked the end of the research, at which point participants were offered the opportunity to ask the researcher any further questions. A debrief sheet was provided, explaining the use of a confederate and the aims behind the research. They additionally signed the debrief, acknowledging the use of a confederate, and to express their continued and informed consent (Appendix L).

4.9.3.3   *Confederate mock-jurors.* Confederates attended session 2 at the same time as the mock-juror so as to create the illusion of an ordinary participant. At this point, the confederate juror was separated and placed in another room whilst the mock-juror completed the pre-questionnaire and measures (described in Chapter 3). Once the mock-juror had read the jury booklet and was ready for the discussion, they were led into the adjacent room and placed opposite the confederate mock-juror where it was explained to both individuals the purpose of the cameras and the 20-minute time limit. It was stressed there should be a unanimous decision and the opportunity to ask any questions was given.

Once the researcher had left the room, the confederate was instructed to begin the discussion with the question 'What do you think; do you think the defendant is guilty or not guilty?' and from there, he/she attempted to persuade the participant to the opposing viewpoint. Once a decision had been made and the cameras were turned off, the researcher led the confederate back into a separate room under the pretence of completing the post-discussion questionnaire. At this point, the confederate juror's role was complete.

4.10 Results

4.10.1 Mock-juror persuasion. Descriptive statistics show that more mock-jurors changed their verdict (70%) compared to those who were not persuaded (30%), after having discussed the case with the confederate mock-juror (n [persuaded] = 46; n [not-persuaded] = 20).

4.10.1.1 *Ethnicity and persuasion.* South-Asian mock-jurors had similar results for persuasion (n = 24) as British mock-jurors (n = 22). To understand whether the two ethnic sub-groups differed, a between-groups chi-square test for independence was run. This revealed that South-Asian and British samples do not significantly differ on persuasion, $x^2(1) = .287, p = .592, \varphi = .07$ (See Figure 4.1).
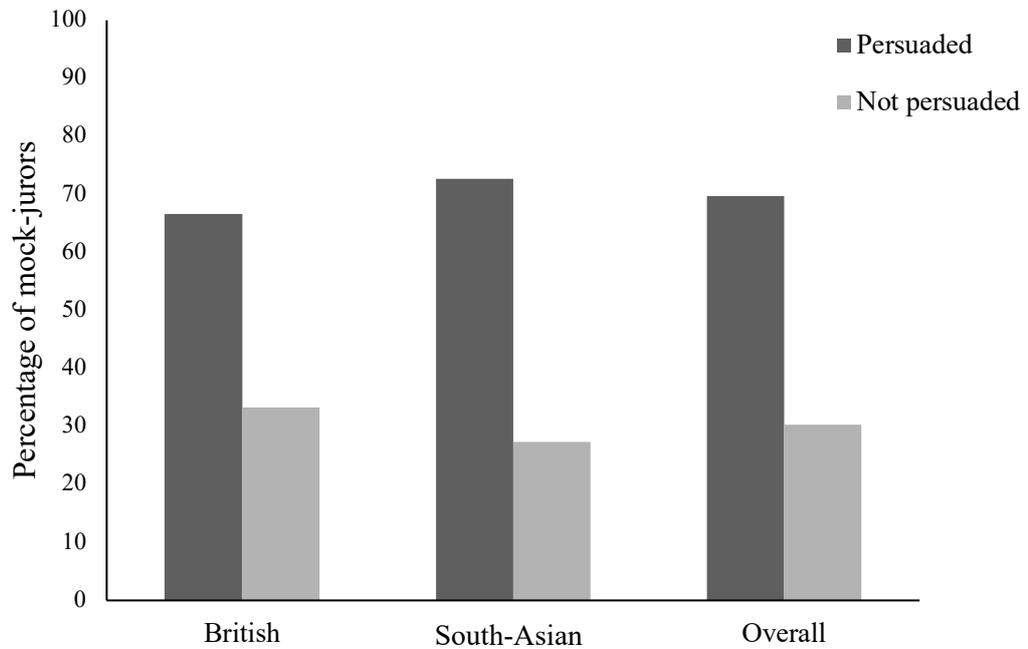
Figure 4.1. Bar graph showing British *(n=33)*, South-Asian (*n=33*) and the overall sample (*n=66*) for persuasion groups.

4.10.1.2 *Gender and persuasion.* A chi-square test for independence revealed a non-significant association for gender and persuasion, $x^2(1) = 2.58$, *p* =.108, φ = .20. Nevertheless, Figure 4.2 (below) illustrates the almost 20% difference in the number of females being persuaded (*n* = 26) compared to males (*n* = 20).
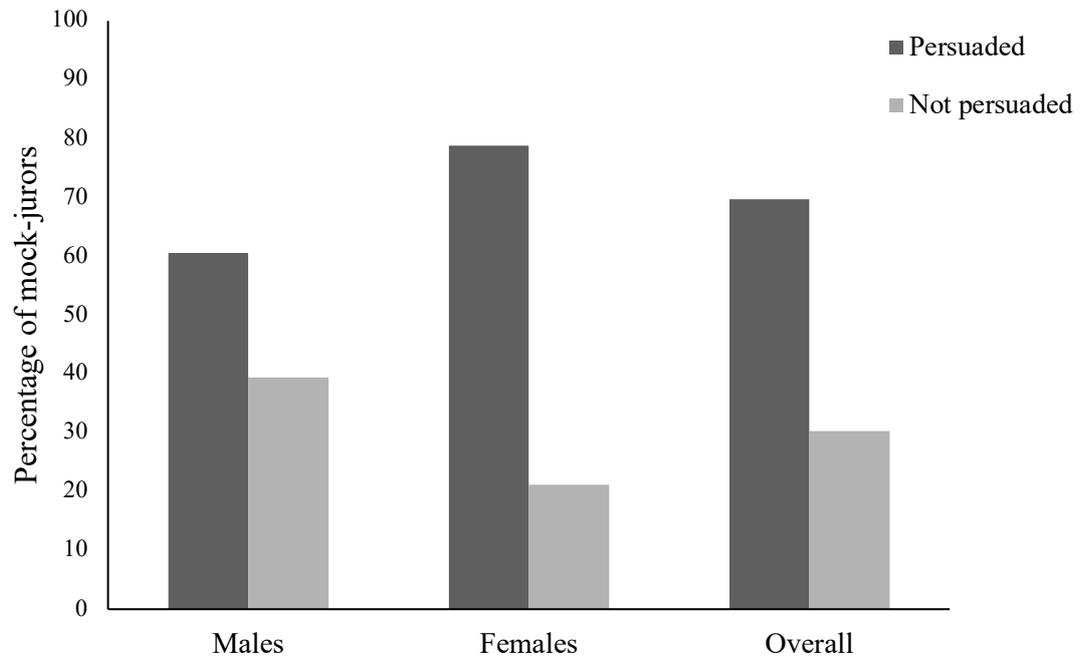
Figure 4.2. Bar graph showing Males (*n=33*), Females (*n=33*) and the overall sample (*n=66*) across persuasion groups.

4.10.1.3 *Gender, ethnicity and persuasion.* Two chi-square tests were conducted for the persuaded groups to investigate gender and ethnicity. This allows for a comparison to be made for British females, British males, South-Asian females, and South-Asian males across both persuaded and non-persuaded groups (see Figure 4.3). This revealed non-significant results for persuaded ($x^2(1) = .07$, $p = .796$, $\varphi = .04$) and non-persuaded groups ($x^2(1) = .02$, $p = .888$, $\varphi = .03$).
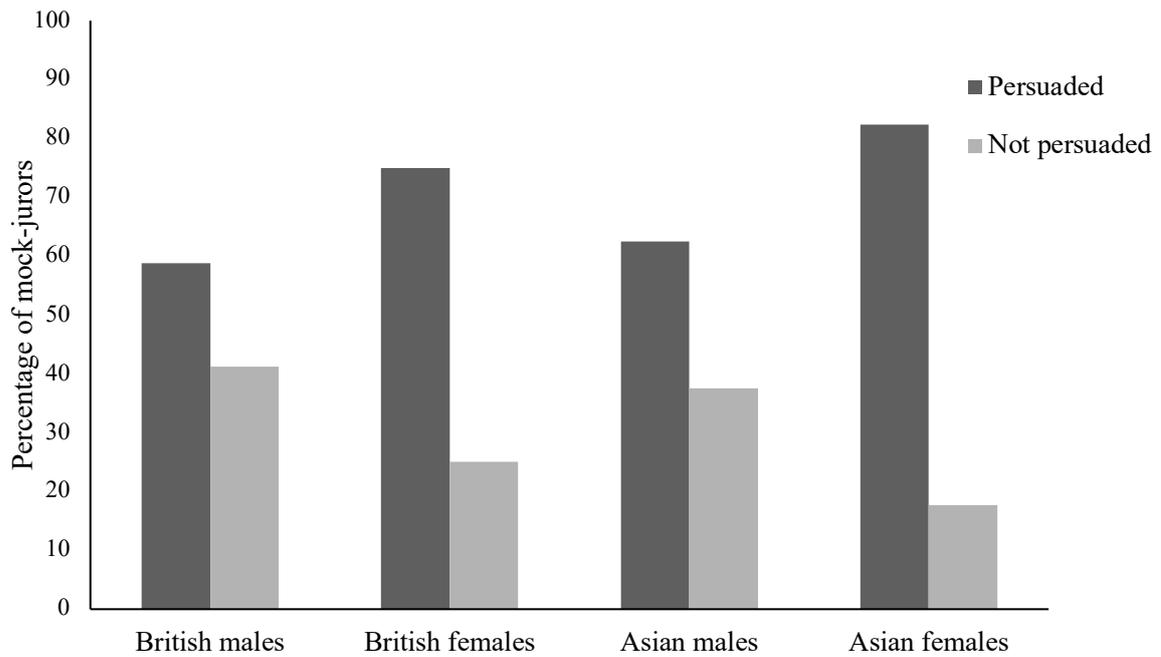
Figure 4.3. Bar graph showing Persuasion as a function of Ethnicity and Gender.

4.10.2   Confidence in verdict choice. To investigate whether persuasion influenced subjective confidence ratings in verdict decisions, a series of univariate ANOVAs were conducted for gender, ethnicity and persuasion to investigate the differences within pre-, as well as post-discussion confidence ratings. This allowed for a direct comparison of confidence means (represented on a percentage scale of 0 [*no confidence*) -100% [*extremely confident/certain*]) to be obtained across the two separate time points (pre- and post-discussion). Both pre- and post-discussion confidence revealed non-significant effects for all three variables (*p*'s >.05), with the means showing persuasion, gender and ethnic groups had similar ratings of confidence in their decisions at the pre-, and the post-discussion time points (see Table 4.1).

Table 4.1

Descriptive statistics, F and p values for pre- and post-discussion confidence ratings in verdict choice across Gender, Ethnicity, and Persuasion

Factor	Levels	Pre-Discussion (%)				Post-Discussion (%)			
		M	*SD*	*F*	*p*	*M*	*SD*	*F*	*p*
Persuasion	Persuaded	67.51	21.05			69.77	19.68		
				1.92	.17			.12	.29
	Not Persuaded	74.21	16.09			75.3	18.57		
Gender	Male	72.19	21.06			71.72	22.45		
				1.18	.28			.01	.93
	Female	66.81	18.4			71.28	16.05		
Ethnicity	British	66.00	21.79			69.88	19.17		
				2.17	.15			.47	.49
	South-Asian	73.22	17.01			73.23	19.73		

Note. *M* = mean; *SD* = standard deviation; *F* = univariate ANOVA statistic; *p* = significance value.

4.10.2.1 *Percentage change in confidence of verdict choice.* A series of univariate ANOVAs were conducted to investigate percentage confidence change as a function of ethnicity, gender and cognitive style. There were non-significant differences for gender, $F(1, 61) = .17$, $p = .680$, ethnicity, $F(1, 61) = 1.63$, $p = .207$, PDI-R (mock-jurors high and low), $F(1, 29) = .78$, $p = .383$, and NfCC (mock-jurors high and low), $F(1, 31) = 3.45$, $p = .073$. This shows that groups did not significantly differ in their percentage change of confidence.

A univariate ANOVA for persuasion was conducted. Levene's statistic revealed that the assumption of homogeneity had been violated ($p < .05$). Therefore, the Welch's adjusted F ratio was used, which revealed a significant effect, *Welch's* $F(1, 60.29) = 98.38$, $p < .001$, $\eta_p^2 = .49$, 95% CI [25.38, 38.33]. Those who were persuaded had a mean confidence change score of 43.59 ($SD = 21.06$, 95% CI [37.19, 49.99]), whereas those not persuaded had a mean confidence change score of 4.68 ($SD = 10.04$, 95% CI [-.15, 9.52]).

A chi-square test was conducted to understand if this significant difference in percentage confidence change was positive or negative. Direction of change was categorically coded as either positive (increasing in absolute confidence), negative (decreasing in absolute confidence) or no change. This resulted in a significant association for persuasion and direction of absolute confidence change, x^2 (2) = 43.19, $p < .001$, Cramer's V = .83. In order to break this down further and identify the level at which the significant association exists, standardised residuals were calculated and analysed (see Table 4.2). These revealed significant effects for absolute confidence in verdict choice for persuasion - that is, those who were persuaded were significantly more confident in their verdict choices. Those that were not persuaded showed no significant change in confidence.

Table 4.2

A 3x2 contingency table containing frequency data (n) and standardised residuals (z) for persuasion and direction of confidence

		Direction of absolute confidence in verdict choice		
		Increased	Decreased	No Change
Persuaded	n	39	4	1
	z	1.9*	-0.1	-3.0**
Not Persuaded	n	2	2	15
	z	-2.9**	.1	4.6***

*$p < .05$, **$p < .01$, ***$p < .001$.

Table 4.2 also shows the descriptive statistics of the direction of confidence change, highlighting that the majority of the persuaded group (88.64%) increased their confidence post-discussion, despite changing their verdict. This is compared to just 10.53% of those not persuaded. The majority of those not persuaded had no change in their confidence of verdict choice post-discussion (78.95%, compared to 2.27% for those persuaded).

4.10.3 Mock-juror cognitive style. Cognitive Style consisting of the Delusional Thinking Inventory (PDI-R) and the Need for Cognitive Closure Scale (NfCC) were analysed for the three primary IVs (persuasion, gender and ethnicity). No significant differences emerged (all *p*'s > .05, see Table 4.3).

Table 4.3

Summary descriptives, F and p values for the total PDI-R and NfCC scores, as a function of Gender, Ethnicity and Persuasion

Factor	Level	NfCC				PDI-R			
		M	*SD*	*F*	*p*	*M*	*SD*	*F*	*p*
Gender	Male	158.53	15.88			54.41	29.55		
				.01	.93			.41	.52
	Female	158.15	18.02			49.18	35.79		
Ethnicity	British	157.62	16.6			48.72	36.52		
				.11	.74			.54	.47
	South-Asian	159.03	17.35			54.7	28.82		
Persuasion	Persuaded	158.02	17.94			51.64	30.79		
				.05	.82			.002	.97
	Not Persuaded	159.05	14.57			52.00	37.56		

To investigate whether the two measures of cognitive style were correlated, a Spearman's rho correlational analysis was conducted on the total scores for each scale. This was due to the parametric assumptions being violated for normality whereby skewness (.900) was two times the standard error (.297. - for non-normal correlation

corrections, see Bishara & Hittner, 2012). The correlational analysis revealed no significant relationship between PDI-R and NfCC, $r = .034$, $p = .786$.

4.10.3.1 *High and low in cognitive style.* The distribution of PDI-R scores for mock-jurors ranged from 0 to 159, with an overall mean score of 51.75 ($SD = 32.72$), consistent with prior research in the normal population (Peters et al., 2004; Ross et al., 2016). To enable analysis on mock-jurors who are considered high or low in the measures of cognitive style, total scores for both PDI-R and NfCC were computed and the first and last quartiles within each measure's scores were taken to represent the extremities. Seventeen mock-jurors scored in the lowest quartile of this distribution and were therefore classified as low on delusional thinking ($M = 15.53$, $SD = 10.58$). Sixteen mock-jurors scored in the highest quartile of this distribution and were thus classified as high in their delusional thinking ($M = 96.94$, $SD = 24.96$). The distribution of NfCC scores for mock-jurors ranged from 111 to 192, with an overall mean NfCC score of 158.34 ($SD = 16.87$). Seventeen mock-jurors scored in the lowest quartile of this distribution and were therefore classified as low on the NfCC ($M = 136.76$, $SD = 10.88$). Sixteen mock-jurors scored in the highest quartile of this distribution and were thus classified as high in their NfCC ($M = 178.81$, $SD = 5.98$).

Univariate ANOVAs revealed no differences between mock-jurors scoring high and low on cognitive style based on duration of jury discussion, or pre-, and post-confidence ($p's > .05$). Likewise, chi-square analyses revealed non-significant differences for persuasion ($p's > .05$), indicating that being classified as high or low in cognitive style does not affect persuasion outcomes (see Table 4.4).

Table 4.4

Descriptive and follow-up inferential statistics for high and low groups on cognitive style measures, across Duration, Pre- and Post-confidence ratings and Persuasion variables

Source		Group Comparison		Statistic	*p*
		High	Low		
PDI-R					
	Duration	$M = 591.69$ $SD = 370.31$	$M = 648.18$ $SD = 504.16$	$F = .13$	.72
	Pre-Confidence	$M = 71.00$ $SD = 25.86$	$M = 71.12$ $SD = 8.77$	$F < .01$	.99
	Post-Confidence	$M = 75.94$ $SD = 13.44$	$M = 75.37$ $SD = 13.67$	$F = .01$	.91
	Persuasion	N P $= 11$ N NP $= 5$	N P $= 11$ N NP $= 6$	$\chi^2 = .06$	.81
NfCC					
	Duration	$M = 613.94$ $SD = 534.63$	$M = 872.88$ $SD = 526.27$	$F = 1.96$	.17
	Pre-Confidence	$M = 73.31$ $SD = 17.74$	$M = 67.65$ $SD = 14.70$	$F = 1.00$	.32
	Post-Confidence	$M = 78.44$ $SD = 19.81$	$M = 69.71$ $SD = 16.05$	$F = 1.95$	.17
	Persuasion	N P $= 11$ N NP $= 5$	N P $= 10$ N NP $= 7$	$\chi^2 = .35$	.55

Note. P = persuaded. NP = not-persuaded.

4.10.4 Duration of jury discussion. For the purposes of this research, duration was defined as the total amount of time (in seconds) that the dyadic pairings discussed the case summary. This was measured from when the confederate mock-juror asked what the mock-juror's verdict was (as instructed in the confederate mock-juror training), to when a

decision had been decided upon and the discussion came to an end (be it a unanimous agreement, or disagreement). The average length of the jury discussions as a function of persuasion were analysed using a univariate ANOVA. This revealed a significant persuasion effect, *Welch's F* (1, 26.71) = 39.34, *p* < .001, η_p^2 = .67, 95% CI [532.29, 760.19)]. Duration of discussion where persuasion occurred was significantly shorter (*M* = 441.56, *SD* = 295.13, 95% CI [353.92, 529.21]) compared in the non-persuaded group (*M* = 1117.00, *SD* = 440.51, 95% CI [910.83, 1323.16]). No significant differences for gender, *F* (1, 64) = .07, *p* = .788, ethnicity, *Welch's F* (1, 58.28) = 1.01, *p* = .319, or cognitive style (high or low) for PDI-R, *F* (1, 31) = .13, *p* = .718, and NfCC, *F* (1, 31)= 1.96, *p* = .171, as a function of duration emerged.

4.10.5 Mock-juror linguistic analysis.

4.10.5.1 *Word count.* To investigate whether the number of words spoken differed as a function of persuasion, a univariate ANOVA was conducted, revealing a significant difference, *Welch's F* (1, 20.96) = 30.07, *p* < .001, η_p^2 = .69, 95% CI [785.66, 1234.49]. Mock-jurors who were persuaded spoke an average of 598.02 words (*SD* = 370.01, 95% CI [488.14, 707.90]) throughout the discussion whereas those who were not persuaded spoke, on average, 1957.80 words (*SD* = 1081.77, 95% CI [1451.52, 2464.08]). No significant main effects of ethnicity, *F* (1, 64) < .01, *p* = .959, or gender, *Welch's F* (1, 47.90) = 2.75, *p* = .102 emerged.

4.10.5.2 *LIWC categories*. To investigate language as a function of gender, ethnicity and persuasion, three between-factor MANOVAs were performed on the primary LIWC categories within our inclusion criteria. There were no multivariate main effects for gender, Wilks's Λ =.77, *F* (10, 55) = 1.62, *p* = .125. However, ethnicity revealed a significant multivariate effect, Wilks's Λ = .44, *F* (10, 55) = 6.93, *p* < .001, η_p^2 = .56. A

series of univariate ANOVAs (applying Bonferroni's correction - see Table 4.5) revealed significant main effects for Clout, Authentic and Social processes. In particular, South-Asian mock-jurors had a higher degree of Clout and Social processing in their linguistic style, whereas the British mock-jurors had an increased Authentic language style.

Table 4.5

Descriptive statistics and follow-up ANOVAs for main effects of linguistic categories for ethnicity (n=66)

Linguistic Category	Ethnicity		Inferential statistic	Significance value	Effect size
	British	South-Asian	F	p	η_p^2
Analytical Thinking	$M = 7.78$ $SD = 6.62$	$M = 5.81$ $SD = 4.25$	2.06	.156	.03
Clout	$M = 36.76$ $SD = 15.63$	$M = 55.92$ $SD = 17.83$	21.53	<.001	.25
Authentic	$M = 37.11$ $SD = 18.75$	$M = 22.34$ $SD = 19.05$	10.07	.002	.14
Tone	$M = 37.41$ $SD = 23.10$	$M = 41.99$ $SD = 18.85$	.78	.381	.01
Total Function words	$M = 65.44$ $SD = 2.58$	$M = 63.48$ $SD = 3.17$	7.59	.008	.11
Affective processes	$M = 4.86$ $SD = 1.39$	$M = 5.43$ $SD = 1.47$	2.54	.116	.04
Social processes	$M = 9.49$ $SD = 2.11$	$M = 13.04$ $SD = 2.65$	36.33	<.001	.36
Cognitive Processes	$M = 19.15$ $SD = 2.68$	$M = 18.74$ $SD = 2.54$	.41	.526	.01

	Drives	$M = 5.18$	$M = 5.77$	1.87	.176	.03
		$SD = 1.42$	$SD = 2.00$			
	Informal Language	$M = 6.68$	$M = 8.26$	3.04	.086	.04
		$SD = 3.37$	$SD = 4.02$			

Note. df = 1,64.

A one-way, between-factor MANOVA for persuasion also revealed a significant and large multivariate effect across the LIWC categories, Wilks's $\Lambda = .57$, $F(10, 55) = 4.12$, $p < .001$, $\eta_p^2 = .43$. Examination of the univariate ANOVAs (applying Bonferroni's correction) revealed significant main effects for Drives and Informal language (see Table 4.6). Observation of the means show that non-persuaded mock-jurors had a higher degree of drives in their linguistic style, compared to the persuaded group, who had a higher rate of informal language.

Table 4.6

Descriptive statistics and follow-up ANOVAs for main effects of linguistic categories for persuasion groups (n=66)

Linguistic Category	Persuasion		Inferential statistic	Significance value	Effect size
	Persuaded	Not-Persuaded	F	p	η_p^2
Analytical Thinking	$M = 5.74$	$M = 9.22$	5.78	.019	.08
	$SD = 4.76$	$SD = 6.70$			
Clout	$M = 43.41$	$M = 53.08$	3.66	.060	.05
	$SD = 19.09$	$SD = 18.27$			

Authentic	M = 31.08 SD = 22.10	M =26.62 SD = 14.91	0.67	.414	.01
Tone	M = 38.86 SD = 22.37	M = 41.62 SD = 18.01	0.23	.629	<.01
Total Function words	M = 64.17 SD = 3.33	M = 65.14 SD = 2.14	1.44	.234	.02
Affective processes	M = 5.41 SD = 1.48	M = 4.55 SD = 1.19	5.17	.026	.07
Social processes	M = 10.90 SD = 2.82	M = 12.12 SD = 3.22	2.41	.126	.04
Cognitive Processes	M = 19.26 SD = 2.89	M = 18.22 SD = 1.59	2.24	.139	.03
Drives	M = 4.94 SD = 1.51	M = 6.70 SD = 1.65	17.90	<.001	.22
Informal Language	M = 8.61 SD = 3.61	M = 4.82 SD = 2.67	17.82	<.001	.22

Note. df = 1, 64.

Due to WC showing a significant difference for persuasion groups (above), a MANCOVA was run to understand whether controlling for this DV would directly affect the results observed for linguistic style. This revealed no significant differences in the primary LIWC categories for mock-jurors who were persuaded vs. mock-jurors who were not persuaded when WC is controlled, Wilks's Λ = .80, F (10, 54) = 1.34, *p* = .236.

4.10.5.3 *Confidence in linguistic style (epistemic modality).* Confidence was measured using the epistemic modality dictionary uploaded to LIWC2015 software. This

allowed simultaneous measurement of linguistic confidence for mock-juror and confederate mock-jurors' as a function of gender, ethnicity, and persuasion. As such, the outputs for confidence relate to outputs from LIWC itself, expressed as a percentage of the total words within each discussion.

A 2 (gender: male v female) x 2 (ethnicity: british v south-asian) x 2 (persuasion: persuaded v not persuaded) MANOVA was conducted for mock-jurors on the two DVs for confidence (epistemic modality: high [confidence] and low [doubt]). No significant main effects or interactions emerged, all F's < 2.96, all p's > .06.

To understand the interaction between the dyadic parings and persuasion outcomes for epistemic modality, a further 2 (dyadic pairing: mock-juror v confederate mock-juror) x 2 (persuasion: persuaded v not persuaded) MANOVA on epistemic modality (high or low) was conducted. The Box's M test of equality of covariances was significant, Box's M = 38.58, F (9, 40716.24) = 4.14, p < 0.01, indicating heterogeneity of covariances. Pillai's trace was subsequently used to assess significance given previous research showing its robustness to statistical violations of covariance homogeneity (Field, 2013; Tang & Algina, 1993). The dyadic pairings revealed no significant differences in epistemic modality, Pillai's trace = .01, F (2, 127) = .60, p = .552, or persuasion, Pillai's trace = .01, F (2, 127) = .47, p = .625. The multivariate interaction was non-significant, Pillai's trace = .04, F (2, 127) = 2.63, p = .076, indicating that confidence does not differ for mock- and confederate mock-jurors, in either persuaded or non-persuaded interactions.

4.10.5.4 *Linguistic style matching (LSM).* To investigate whether LSM was higher in interactions that result in a mock-juror changing their verdict, a comparison of the mean total LSM scores across persuaded and non-persuaded mock-juror groups was conducted. The mean LSM score for those who were persuaded was lower (M = .87, SD = .05, 95% CI [.85, .88]), than the scores for those who not persuaded (M = .90, SD = .03,

95% CI [.88, .92]). Levene's Test of Equality of Variances indicated that the homogeneity of variances had been violated and so the Welch-Satterthwaite independent t-test was used to control for Type 1 error (Delacre, Lakens & Leys, 2017). This produced a significant difference in the LSM total score for persuasion groups, t (59.91) = -3.18, p = .002, d = .73, 95% CI [-.05, -.01]. Non-persuaded interactions had higher levels of linguistic synchronicity despite coming to opposing conclusions and resisting the persuasive messaging.

     4.10.5.4.1 LSM over time. To understand the role LSM plays in persuasion processes over time, the jury interactions were split into quartiles and total LSM was calculated as a function of each time slot. A 2 (Persuasion: persuaded v not persuaded) x 4 (Time: 1 v 2 v 3 v 4) mixed-factor ANOVA revealed a non-significant result for time, F (3, 192) = .47, p = .701. However, there was a significant main effect for persuasion, F (1, 64) = 24.00, p < .001, η_p^2 = .27, 95% CI [.73, .95], whereby those who were not persuaded had significantly higher LSM (M = .85, SD = .03, 95% CI [.82, .87]) than those who were persuaded (M = .78, SD = .05, 95% CI [.76, .79]), corroborating the previous findings reported above. Further, there was a non-significant interaction, F (3, 192) = .46, p = .711, indicating that LSM did not differ across the time phases of the jury discussion for persuaded and non-persuaded groups (see Figure 4.4).
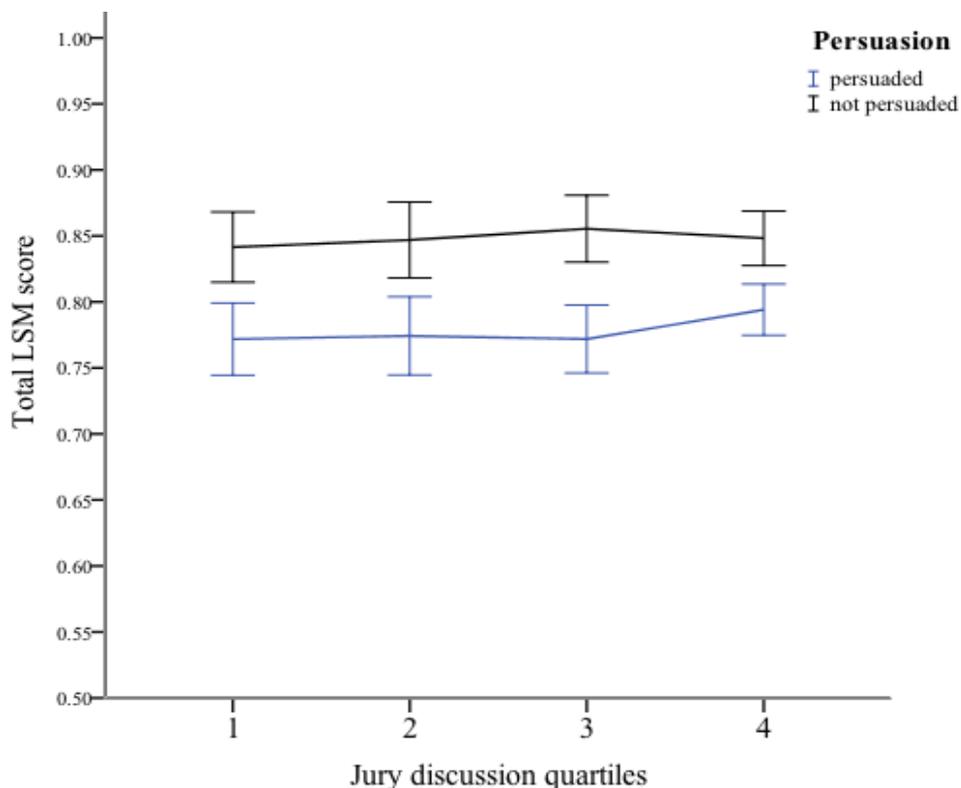
Figure 4.4. Mean LSM score across jury discussion quartiles as a function of Persuasion. Error bars denote ± 2 SE (standard error of the mean).

4.10.6   Mock-juror qualitative content analysis (QCA). Qualitative content analysis (QCA) was conducted on the pre- and post-questionnaire's, as described in detail in Chapter 3. Seven unique themes emerged. A complete table of the QCA descriptive statistics within each theme are reported in full in Appendix M1, showing the coding frequencies and percentages of responses to the pre-set questions.

4.10.6.1   Descriptive group comparisons for the pre-questionnaire.

Theme 1: Facts used to inform decision-making. Concerning question 1, participants chose to expand upon the arguments presented in the case file summary, focusing primarily on the prosecution's argument (42.4% of respondents compared to the defence's argument at 18.2%). This pattern followed across persuasion, ethnicity, gender and cognitive style groups. It indicates that participants were fully engaged with the

material presented to them, elaborating and further developing the arguments given prior to the jury-discussions, albeit biased towards the prosecution's argument.

Theme 2: References to accused. The majority of participants (65%) who were not persuaded referred solely to 'the company' or 'Datastore' as a generalised entity when reporting their reasoning for their verdict choice prior to the discussion. This is in contrast to 43.5% of those in the persuaded category. Very few (5% not persuaded; 13% persuaded) referred only to the individual (the managing director/ accused) solely within answers to the pre-questionnaire, indicating a lack of cognitive apprehension towards the individual on trial.

Theme 3: Reasoning for verdict choice. Across all groups and on average across all participants, the primary reason for choosing a verdict choice focussed on category code 9. This encompasses negligence of the company, focussing on a rationale that they failed to provide a service and thus failed in their duties. This fits with Theme 1, whereby the majority of participants used the prosecution's argument to inform their verdict choice.

Category code 10 focusses on the managing director (MD) specifically, their reasoning being that the MD is responsible due to his position and responsibility. Interestingly, no British participants fell into this category. However, 15.2% of South-Asian participants reported this code within the reasoning for their verdict. Some mock-jurors mentioned that they chose their verdict choice as they felt there was a lack of certainty and evidence around the facts, thus indicting a sense of hesitancy in their initial choices. However, there were no differences for the cognitive style categories (high or low in NfCC and PDI-R) regarding the 'lack of certainty or evidence' reasoning (QCA code 12).

Participants falling into category code 141 do not expand on their reasoning other than to use vague rationale pertaining to the facts contained within the summary. Of those who were persuaded, 15.2% focussed primarily on this reasoning in comparison to 5% in

the not-persuaded group. This perhaps indicates that expansion of cognitive reasoning outside of the evidence provided strengthens resistance to persuasive attempts. As such, 4.3% of the persuaded group fell into category 13 (analytical reasoning focussing on the judge's instructions and duty as a jury member) compared to 10% of participants who were not-persuaded.

Theme 4: Attribution of responsibility. Following from the theme that the majority of participants (60.6%) expanded on the prosecution's argument and reasoned that the company failed to provide a service and was thus negligent, participants largely attributed responsibility to the MD and company. Individuals who did not fall into this category largely referred to the hackers being responsible (15.2%) or failed to attribute responsibility to anyone when answering the pre-set questions (19.7%). This pattern followed across all sub-group IVs (consisting of cognitive style, gender, ethnicity and persuasion).

Theme 1: Facts ignored in the decision-making process. The information predominantly ignored and not taken into account during the decision-making consisted of the background information contained within paragraphs 1 to 4 of the file summary, comprising QCA code 4 at 43.9%: '*The potential consequences* [FB8]; '*Info about what the newspapers reported and the disruption caused to the country*' [FB6]; '*The press, the consequences of the document being published, the consequences of such actions like wide spread panic. It doesn't explain or justify if the MD is guilty or not*' [MA10]. This was closely followed by discounting the defence's argument, at 33.3% (QCA code 1). Once again, this pattern did not differ across the sub-groups of the IVs. In sum, the majority of mock-jurors ignored the background information which sets the picture, instead focussing on the evidence contained within the case summary, despite some mock-jurors being persuaded and others not.

Theme 3: Reasoning for ignoring these facts. This theme produced an array of category codes and no primary pattern across the IV groups. The highest percentage of participants (22.7%) ignored the information they did because it was irrelevant to the case of negligence: '*Not relevant to the topic where the hacking is concerned*' [MB5] whilst 18.2% ignored evidence that suggested that the company failed to provide an adequate service (QCA code 9).

4.10.6.2   Descriptive group comparisons for the post-questionnaire.

Theme 1: Facts used to inform decision-making. After the discussion with the confederate juror, the facts upon which the participants used to inform their decision-making became much more varied than the pre-questionnaire results to this same question. The highest scoring category (28.8%) continued to focus on expanding the prosecution's argument whilst 18.2% of mock-jurors in the pre-questionnaire question expanded on the defence's argument when explaining their decision-making on the post-questionnaire. 15.2% focussed on the fact that the MD as an individual was being charged, whilst the same number (15.2%) used the fact that there was little information and evidence contained in the case file to inform their verdict choice. Those who were persuaded expanded on the prosecution's argument (26.1%), whilst a similar number also expanded on the defence's argument (23.9%) indicating that those who changed their opinion used the persuasive messages presented in the discussion to expand on the chosen verdict and explore this outside of the evidence presented in the case summary. In addition, 21.7% of those who were persuaded (be it guilty or not guilty) used the fact that an individual (the MD) was being charged, whereas no-one in the non-persuaded group used this fact to inform their decision.

Theme 2: References to accused. More than half of the South-Asian participants (51.5%) referred only to the defendant. The British group primarily focussed on the company as an entirety (39.4%) rather than singling out the accused (15.2%). This

seemingly mirrors findings from Theme 3 of the Pre-Questionnaire, whereby 15.2% of South-Asian participants focussed on the MD being charged as a reason for their verdict choice; in comparison to no-one in the British sample.

Similar to the South-Asian group, individuals high in NfCC predominantly referenced the accused individual (63.6%), with no individuals high in NfCC falling into QCA codes 502 (*referencing only the company as an entity*) or 503 (*reporting no references to accused*). In contrast, low NfCC was much more evenly spread throughout theme 2, with 35.3% falling into QCA code 501 (*referencing only the defendant*).

Theme 3: Reasoning for verdict choice. Overall, the highest proportion of participants fell within QCA code 142 which focusses on a not-guilty verdict using real-world evidence and examples (30.3%), followed closely by the reasoning of negligence due to the company not providing an adequate service (21.2%; QCA code 9).

The majority of the persuaded participants reasoned by expanding on the defence's argument and utilising the background information (39.1%. For example, '*It is the government's fault for not ensuring that the security was at a higher level sufficient enough for this data*' [MB6]). No individuals who were within the not-persuaded sub-group used moral reasoning to explain and justify their verdict choice (QCA code 8), whereas 13% of persuaded individuals did fall into this category. It is also interesting to note that 30% of non-persuaded individuals cited a lack of certainty and/or evidence in their decision-making processing. For example, '*They are not guilty as there isn't enough to say they were negligent*' [MA14]; '*Difficult to remember some of the info that the other jury member said she had seen and would be wrong to convict on that*' [MB14], compared to 6.5% of the persuaded individuals who fell within the category. Likewise, those high in delusional thinking fell largely within the 'lack of certainty' category (25%; QCA code 12) unlike individuals low in delusional thinking (5.9%). However, this was not the case for

the NfCC, whereby only one individual from the high and low sub-groups fell within QCA code 12.

Theme 4: Attribution of responsibility. This theme produced similar findings to the pre-discussion questions, whereby the highest scoring category meant that 39.4% of participants attributed guilt to the accused (be that the company or the defendant) which followed across sub-groups. However, this excludes individuals high in delusional thinking, who primarily accused others of being guilty, reasoning that they did not have the full picture and that others may be at fault (43.8%). For example, '*The government should not have outsourced such documents*' [MA12]; '*I think there must be someone else beneath the MD to blame more*' [FA15].

Theme 5: Persuasiveness of the confederate. From the 46 participants who were persuaded within this study, over half (58.7%) cited that they changed their verdict due to the confederate mock-juror challenging the evidence presented and highlighting missing information (QCA code 163). This was the prevalent response to theme 5 across all IV's (gender, ethnicity, cognitive style) but one: the non-persuaded participants. 55% of not-persuaded individuals largely fell into QCA category 156, conceding that the confederate mock-juror did say some persuasive points despite this not influencing their verdict choice ('*sure she made points that were relevant but I don't believe they would make the defendant not guilty*' [MB2]).

Theme 6: Communication during the discussion. The majority of participants (33.3%) commented that the communication during the jury discussion was friendly and pleasant. This occurred across most of the IV's including the persuasion groups, irrespective of the individual being persuaded or not (35% not-persuaded falling into QCA code 21; 32.6% persuaded within this category). 27.3% of the British sub-group commented that the discussion was balanced and fair ('*It was quite balanced, so it was not hard to come to an agreement*' [FA6]). Very few individuals from the entire sample

(10.6%) fell into QCA codes 23 and 24, which depicts the discussion as being awkward, argumentative or rigid.

Theme 7: Additional comments. More than half of the sample did not provide additional comments (53%). However, of those that did comment, they did so on the fact that the research seemed realistic and proceeded to mention additional points in this section which related to the case and jury discussion ('*With a not guilty verdict, I would feel happier purely on the basis that I wouldn't be responsible for the conviction of an innocent person*' [FB17]).

4.10.7 Confederate mock-jurors.

4.10.7.1 *Social ratings.* Mann Whitney U tests were conducted to examine juror's ratings of friendliness and aggressiveness of the mock jurors as function of gender, ethnicity, and persuasion groups. Mock-jurors rated the confederate mock-jurors' communication style for Friendliness and Aggressiveness following the jury discussion on a Likert scale ranging from 1-5 (*Friendliness*: 1 = very unfriendly, 3 = neutral, 5 = very friendly; *Aggressiveness*: 1 = very aggressive, 3 = neutral, 5 = very passive). As seen in Table 4.7, gender and ratings of friendliness of the confederate-mock-juror were significant ($p < .05$). The mean ranks show that male mock-jurors rated the female confederate higher in friendliness (Mrank = 38.83) compared to female mock-jurors (Mrank = 28.17) rating the male confederate. Persuasion and ratings of aggressiveness also revealed a significant result ($p < .01$). Persuaded mock-jurors rated their confederate mock-juror significantly higher (Mrank = 38.28) and thus more passive than the non-persuaded mock-jurors (Mrank = 22.50), who perceived the confederate as being more aggressive during the jury discussion. All other comparisons across the IV's revealed non-significant results ($p > .05$).

4.10.7.2 *Word count (WC).* To understand flow and dominance of the discussion, word count was compared across mock-jurors and confederate mock-jurors. A one-way ANOVA revealed no significant effect, $F(1, 130) = 1.10$, $p = .296$, indicating that both mock-jurors and confederate mock-jurors spoke and participated equally within the discussions. However, when word count was separated by Persuasion, a different result emerged. Across the persuaded discussions, confederate mock-jurors had a significantly higher word count ($M = 906.17$, $SD = 838.80$, 95% CI [657.08, 1155.27]) than mock-jurors ($M = 598.02$, $SD = 370.01$, 95% CI [488.14, 707.90]): Welch's $F(1, 61.87) = 5.20$, $p = .026$, $\eta_p^2 = .23$, 95% CI (614.78, 889.41). Discussions whereby no persuasion occurred resulted in no significant difference in the average word count for mock- jurors ($M = 1957.80$, $SD = 1081.77$) and confederate mock-jurors ($M = 1823.15$, $SD = 1038.97$), $F(1, 38) = .16$, $p = .690$. This shows that confederate mock-juror's use more words during the jury discussion than the mock-juror when persuasion was successful.

Table 4.7

Descriptive statistics and Mann Whitney U results for mock-jurors' ratings of the confederate mock-juror, for ethnicity, gender and persuasion groups

	Friendliness					Aggressiveness				
	Median	U	z	p	r	Median	U	z	p	r
Ethnicity	South-Asian = 4.0 British = 4.0	521.50	-.32	.748	-.04	South-Asian = 3.0 British = 3.0	447.00	-1.36	.175	-.17
Gender	Male = 5.0 Female = 4.0	368.50	-2.45	.014	-.30	Male = 3.0 Female = 3.0	529.50	-.21	.835	-.03
Persuasion	Persuaded = 4.5 Not persuaded = 4.0	343.00	-1.77	.076	-.22	Persuaded = 3.0 Not persuaded = 3.0	240.00	-3.33	.001	-.41

4.10.8   Overview of results. The results show that overall, mock-jurors are more persuaded than not as a result of the jury discussion with a mixed-gender confederate. Gender revealed non-significant differences for persuasion outcomes. However, females were more likely to be persuaded than not, compared to men, who did not differ in their likelihood of persuasion.

Subjective ratings of confidence in verdict choice, both before and after the jury discussion did not influence persuasion outcomes when analysed across the sample data. However, the mock-jurors' percentage *change* in confidence for their verdicts produced a significant result. Individuals who were persuaded had on average, a 44% increase in their confidence rating for their final verdict choice, which is a larger and increased confidence percentage change compared to non-persuaded interactions - scoring on average, a 5% change in confidence across the two time points. The results showed that non-persuaded mock-jurors neither increased nor decreased in their confidence for their verdict choice as a result of the jury discussion.

The two measures of cognitive style (NfCC and delusional thinking) were found not to correlate, illustrating that the two measures were unrelated. Comparing participants who scored high or low in the two measures produced non-significant results when analysed against persuasion, duration of discussion and confidence in verdict, both pre- and post-discussion.

The duration of the jury discussion was calculated and compared against persuasion outcomes, which resulted in a finding that discussions leading to the mock-juror changing their initial verdict (ie, being persuaded) had shorter interactions (measured in seconds) compared to those who were not persuaded, who talked, on average almost 3 times as long. This is additionally reflected in the word count data, which highlights that more words

were uttered in the non-persuaded interactions compared to the persuaded discussions. Furthermore, the data revealed that when the interaction resulted in no change in the verdict by the mock-juror, word count did not significantly differ – here, the mock-juror and confederate mock-juror were both contributing equally to the conversation resulting in similar word counts. However, when individuals were persuaded, the confederate mock-jurors had a significantly higher word count than the mock-jurors, indicating that participants were listening more and talking less.

Linguistic analyses revealed differences in ethnic and persuasion groups across various linguistic categories. For example, persuaded individuals had a higher degree of informal language in their speech compared to non-persuaded mock-jurors, and South-Asian mock-jurors used more clout and social processing during their discussions whereas British mock-jurors used more authentic language. Confidence in linguistic style, as measured using the epistemic modality dictionary revealed non-significant results across all IVs.

Linguistic style matching (LSM) measured the linguistic similarity between the two communicators. Findings revealed that non-persuaded interactions produced LSM to a greater extent than persuaded interactions. These findings did not change when word count (WC) was controlled. Cognitive style, gender and ethnicity produced similar LSM scores and thus did not significantly differ on synchronicity of linguistic style. When LSM was investigated throughout 4 time segments, again this revealed no significant differences in LSM as the interaction progressed.

Qualitative analyses (QCA) revealed that the majority of participants expanded on the arguments presented to them and used general reasoning of negligence to inform their decision-making. Post-discussion, the reasoning for verdict choices become much more varied, yet the majority of reasoning depicted did not differ across the IVs. Interestingly

however, more than half of the South-Asian participants referred only to the defendant in their post-discussion reasoning compared to the British participants, who tended to report on the company rather than singling out the individual defendant. Additionally, more than half of mock-jurors claimed to have been persuaded due to the challenging of the evidence they presented during the interactive discussion. Overall, most participants recorded that the interaction was friendly, balanced and fair.

When analysing the impact of confederate mock-jurors, it was found that mock-jurors perceived interactions to be less aggressive when they were persuaded by said confederate. This is in direct contrast to those who were not persuaded, who, on average rated the confederate as significantly more aggressive. Subjective ratings of the confederate also produced a significant result for friendliness as a function of gender. The data revealed that females rated the male confederates as less friendly when compared to males rating the female confederates.

4.11 Discussion

This first experimental chapter reports the investigation of persuasion in a traditional face-to-face context, alongside the impact of gender, ethnicity, cognitive and linguistic style. This research is novel in that the original jury method materials has been updated to reflect more contemporary criminal events, and this is the first time the impact of gender, ethnicity, cognitive and linguistic style have been investigated in unison. Thus, this study will serve as a baseline for further studies of persuasion in contemporary contexts, presented in the following chapters.

Despite the novelty of this research, the available literature relevant to this programme of PhD research supported the tentative formulation of a series of hypotheses

and as such, the results of this chapter will be discussed with reference to the hypotheses below.

1. South Asian participants will show greater persuasion post-jury discussion compared to British participants;

2. Females will be more persuadable by a male confederate;

3. There will be a relationship between cognitive style and persuasion outcomes;

4. Male speech will display higher confidence and an individualistic style (e.g., swear words, increased word length) compared to females;

5. Participants expressing higher confidence (expressed linguistically and through measurements of meta-cognition via pre-and post-questionnaires) will be less likely to be persuaded to change their verdict choice;

6. Linguistic style (both in terms of LSM and LIWC outcomes) will differ as a function of gender and persuasion outcomes.

Overall in FtF dyads, more mock-jurors were persuaded to change their decision following the jury discussion than those who retained their initial pre-discussion stance. This is in line with the media richness theory (MRT), which posits that modalities which enable immediacy of feedback, natural language exchanges and support numerous cue systems lead to increased intentions to alter behaviour (Daft & Lengel, 1986; Hammick & Lee, 2014). It also lends credence to the assumption made by the HSM that the heuristic route is the default route to persuasion where there is an abundance of heuristic cues to add to, or bias persuasive processing.

Contrary to predicted ethnic differences in persuasion, participants from two diverse ethnic backgrounds did not differ in their propensity for persuadability, thus hypothesis one was not supported. This lack of differentiation between the two ethnic

groups is considered to be inconsistent with Hofstede's (1980) cultural dimensions, predicting differences in reasoning and judgement across diverse ethnic groups. However, such dimensions exist on a continuum, with most previous research recruiting participants at the extremes of such a continuum (e.g., East Asian and American cultures; Setlock et al., 2007; Taylor, Larner, Conchie & Menacere, 2017). These findings suggest the notion that Ind/Col cultural norms may be diluted for first-generation migrants, and supports the need for further contemporary research concerning the multi-level nature of ethnicity (e.g., Minkov, 2018).

That females were more susceptible to persuasive attempts than their male counterparts when interacting in cross gender dyads is entirely consistent with enduring gender-stereotypical assertions that women are more agreeable and more easily influenced (Eagly, 1978; Eagly & Carli, 1981; Ellemers, 2018) and is supportive of hypothesis two. The primary focus of this thesis is on the persuadee and their influenceability, thus the paradigm remains constant across the discussions. Nevertheless, it would be interesting to note whether this gender effect is indeed due to females having an increased propensity to be persuaded versus the ability of the opposing gender to persuade. For example, it has previously been argued that individuals are more influenced by males than females (Carli, 2017), and this holds in experiments where behaviour has been kept constant whilst gender has been manipulated (Carli, 2001; Elias & Cropanzano, 2006). Indeed, Propp (1995) found groups were six times more likely to use an idea to inform their decision when it was presented by a male, rather than a female.

Turning to hypothesis three, the current findings are counter to those of previous studies investigating cognitive style, such as need for cognitive closure on persuasion (NfCC - where individuals jump to conclusions and freeze their decision-making in the presence of prior information). For example, Kruglanski, Webster and Klem (1993) manipulated NfCC situationally and individually within the jury method paradigm and

found that participants high on NfCC were more resistant to persuasion. Koot, ter Mors, Ellemers, and Daamen, (2016) and Viola and colleagues (2015) report finding NfCC moderates decision-making whereby persons high on NfCC appear more influenced by outcome relevance and so invest more cognitive effort into maintaining their position; the suggestion being that individuals high in NfCC process information in a more elaborate and effortful manner (Viola et al., 2015) and thus can cognitively justify a chosen position.

Here, cognitive style (delusional thinking and the NfCC) were not related, correlated, nor did they significantly differ as a function of persuasion outcome, gender, ethnicity, or linguistic style. One key difference between previous research and the current study was that NfCC and delusional thinking were not systematically manipulated. Rather, the scores were collected and analysed post-hoc. Experimental manipulation of individuals scoring high and low in the two measures may provide alternate findings more in line with the theoretical literature in this field. However, from an applied perspective where these measures can neither be measured nor manipulated this research suggests their utility is limited.

The current findings do not support a gender differences model for language, which has been cited in most research regarding linguistic style and gender, and so was used to inform both hypotheses four and six. Hypothesis four predicted that male speech would display higher confidence and a more dominant linguistic style (e.g., swear words, increased word length). Conversely, these predicted gender differences were not found despite a significant amount of research indicating the differentiations in linguistic style for gender (e.g., Pennebaker et al., 2015). More recently however, researchers have begun to question the notion of gender differences in naturalistic conversations, arguing that it is the manner in which the conversation progresses that may be gender specific rather than the linguistic content – females being interrupted more that male speakers, for example (Hancock & Rubin, 2014). This aspect of language/linguistic style nor the conversational

process was considered here, but for persuasion this may be relevant and so is a potential for future research (also see Coates & Cameron, 2014).

In the more naturalistic conversational setting employed for this research, gender similarities across the ten linguistic themes measured by LIWC emerged. One possible explanation for this outcome comes from the gender similarities hypothesis (Hyde, 2005). Based on a review of 46 meta-analyses, Hyde argues that males and females are similar on most psychological variables, with gender differences in language being moderated by contextual variables such as partner familiarity, gender composition, status, and nature of the topic (Leaper, 2014; Pillon, Degauquier, & Duquesne, 1992). Interestingly, one piece of research which has reported similar findings to those reported here comes from an experimental study with similar situational factors to that of the current paradigm (Pillon et al., 1992). For example, participants interacted in mixed-sex dyads, with individuals they were not familiar with (strangers), and the authors measured linguistic style through conversational behaviour. It should also be noted that the study by Pillon and colleagues was one of the few which used participants that were not American. It may be that differential cultural identities interplay with gender norms.

Confidence in post-discussion verdicts run counter to those of London et al. (1970b), who found that persuadees had lower certainty in their final opinion than persuaders. Here, confidence levels remained consistent with no difference in post-discussion verdict confidence across the persuasion groups. This result casts doubt on the concept of the sufficiency principle, outlined in the HSM (see Figure 1.1), stating that one's difference in actual and desired confidence serves to guide the route of persuasive processing. The findings here show that different persuasive outcomes occurred despite their subjective confidence remaining consistent across pre- and post- measurements. For example, if one is motivated to achieve an accurate and confident decision, their threshold is likely to be high, and thus if persuaded, this would be expected to close given that they

have changed their verdict in order to achieve a higher degree of accuracy and/or confidence.

In addition to a lack of differences for meta-cognitive confidence in decisions, findings revealed similarities for epistemic modality, indicating that expressed confidence and doubt is not indicative of persuasion outcomes, contradicting hypothesis five. However, a comparison of confidence *changes* from pre- to post-discussion did show a significant increase in confidence for persuaded mock-jurors. Not only were mock jurors more likely to change their verdict following the jury discussion for this study, but those who were persuaded increased their confidence, despite the final decision being completely different to their initial conclusion. This indicates that persuasion wasn't arbitrary, due to conformity or any sort of peer pressure. Indeed, outcomes from the qualitative content analysis show that mock-jurors were primarily persuaded from evidence-based challenges. Thus, this highlights that persuaded mock-jurors were motivated by accuracy and engaged in processing which served to increase their subjective confidence following high elaboration and rational arguments.

Of note here is the confidence of participants who were not persuaded. Indeed, these individuals remained consistent in their self-rated confidence, contradicting theories on resistance to persuasion which would predict an increase in confidence post-resistance, and thus does not support hypothesis five. For example, McGuire's inoculation hypothesis argues that exposure to an initial persuasive communication can strength one's resistance to further persuasion on the topic area (McGuire, 1964; McGuire & Papageorgis, 1961). Furthermore, resistance to persuasion and exposure to persuasive arguments has been found to bring about crystallization of an individual's viewpoints, with that individual being increasingly unlikely to be persuaded (Clarkson, Tormala, & Rucker, 2008; 2011). Given the positive responses to the QCA analysis for non-persuaded mock-jurors (55% conceding that the confederate said some persuasive points), it is clear that mock-jurors did

not have a negative response to the persuasive attempts; a negative effect being where the receiver deliberately, and as a direct consequence of the arguments, strengthens and increases confidence in their initial viewpoint, or even adopts an opposing attitude at the most extreme. This did not happen. Rather, they engaged in interactive discourse in which they debated and were exposed to counter-arguments. This exposure was not enough to convince them to change their mind, nor was it enough for them to foster a negative resistance effect to the alternate opinion.

There is very little research investigating the expansion of synchronicity of language into bilateral persuasive interactions, which may be one explanation as to the lack of findings within the current persuasive paradigm. Research has consistently reported a higher degree of LSM in successful negotiations and thus it was hypothesised (hypothesis six) this would extend into the persuasive space, leading to enhanced rapport, trust and thus persuasion. However, the reverse has emerged, with higher synchronicity of linguistic style for non-persuaded interactions. Niederhoffer and Pennebaker state there has been conflicting research in this area, with the authors finding high levels of LSM for both positive and negative outcomes. Indeed, they proposed that it is engagement in the conversation that influences synchronicity of language (Niederhoffer & Pennebaker, 2002). The coordination-engagement hypothesis posits that when two individuals are actively engaged in conversation (be that in a positive or negative manner), the more verbal and non-verbal coordination is proposed. Thus, it is engagement in the conversation rather than rapport or 'liking' that influences synchronicity of language. This indicates that non-persuaded mock-jurors were more engaged in the discussion than persuaded mock-jurors, which is evidenced in that non-persuaded interactions lasted, on average 18 minutes compared to persuaded discussions (lasting a mere 7 minutes on average). It implies that successfully persuaded outcomes originated from a central route of processing: elaborating

on and engaging with the arguments presented, motivated to achieve an accurate and confident answer.

To conclude, the findings from this first study reveal new insights regarding the interplay of bilateral persuasion on gender, ethnicity, cognitive style, and language. In order to investigate naturalistic persuasion further and to understand persuasion in more contemporary contexts, the next study in this thesis will investigate persuadability using instant messaging technology.

Chapter Five: The Synchronous, Computer-Mediated Communication Modality

(Study 2)

5.1 Introduction

Communication is no longer restrictive to face-to-face encounters (FtF), with technology becoming increasingly integrated into our everyday lives. Computer-mediated communication (CMC) allows interaction whereby traditional barriers of distance and time no longer hinder remote communication. For example, in December 2017, internet usage was estimated at 54.4% of the world's population, a 1052% increase since 2000 (Internet World Stats, 2018). This substantial growth opens up new opportunities for researchers to investigate aspects of social cognition such as persuasion in novel contexts.

Despite most technology now equipped with audio and video enabled features, text-based CMC remains a popular form of online communication, with the majority of communication occurring via instant messengers online and via mobile phones (Statista, 2018b). Additionally, it has recently been reported that 90% of young adults use social media. Furthermore, this increase is not solely restricted to the younger generation, with usage tripling over the last decade in adults over 65 years of age (Pew Research Center, 2015). However, this modality *is* limited in terms of relaying paralinguistic cues and body language, which are taken into account (whether consciously or unconsciously) when interacting and conversing with others FtF (Guerrero & Floyd, 2006; Hargie, 2016). Media-rich modalities which allow for unconstrained transmission of non-verbal and paralinguistic cues enable rapid communication and allow ambiguous messages to be clarified immediately, often leading to better performance on decision-making tasks (Daft & Lengel 1986; DiBlasio & Milani, 2008; McGrath & Hollingshead, 1993). This implies that a more constrained communication modality will hinder decision-making processes

and change social cognition when interacting in a synthetic environment. A primary component of this change is owed to the anonymity that text-based CMC affords.

Individuals often have the ability to withhold or even create new information about themselves. For example, portraying alternative gender, ethnicity and ages when online. This concept is becoming increasingly prevalent in the mainstream media, with popular reality shows even dedicated to the public interest of anonymity online as a social experiment ('The Circle', Channel 4). Some individuals have expressed that anonymity enables them to talk freely, allowing open and honest communication (Suler, 2004). However, there is a darker site to anonymity online, with research suggesting it can normalise and encourage uninhibited behaviour such as flaming, trolling and bullying (Moore, Nakano, Enomoto, & Suda, 2012; Siegel, Dubrovsky, Kiesler, & McGuire, 1986), decreased group consensus (Daly, 1993) and lower satisfaction in final decisions and outcomes (Baltes, Dickson, Sherman, Bauer, & LaGanke, 2002). In addition, the restriction of non-verbal and paralinguistic cues which is often used to discern attitudes and attributes can lead to enhanced negative perceptions of the conversation partner (Siegel et al., 1986). Researchers confirm that the lack of feedback (which arises naturally during FtF exchanges) leads to social norms of politeness being violated online (Kiesler, Siegal, & McGuire, 1984), and likability of conversational partners decreasing (Weisband & Atwater, 1999).

Furthermore, the synchronicity of the medium has been suggested to impact on the levels of media richness in communication. Synchronous CMC is considered more interactive than asynchronous exchanges and is therefore perceived to be higher in media richness; promoting higher degrees of involvement and engagement by facilitating instant communication and real-time feedback of the individuals writing or read status, as well as the option of emoticons to express feelings and emotions (Fullwood & Martino, 2007). The majority of research which has investigated differences in social cognition in online

settings has primarily focussed upon asynchronous CMC such as email, perhaps due to the relatively novel proliferation of instant messaging systems. It is therefore beneficial to investigate text-based CMC using instant messaging modalities.

5.2 Resistance to Persuasion

Persuasive messages do not always result in a change of decision: indeed, persuasion attempts can go in the opposite direction and produce a negative persuasion effect. In other words, resistance to persuasion can occur as a direct result of the message or modality (Pfau, Holbert, Zubric, Pasha, & Lin, 2000). One fundamental resistance theory is known as inoculation (McGuire, 1964), considered an active process whereby counter-arguing featuring critical reasoning, elaboration and verifiable evidence leads to resistance of the counter-message arguments over time. McGuire and Papagorgis (1961) first reported this effect when participants seemed to become impervious to subsequent stronger persuasive attacks after they had initially been exposed to a mild persuasion attempt. It is thought to occur in two ways. Firstly, initial persuasion increases awareness of the perceived vulnerability of the attitude or belief and thus motivates defence building. Secondly, the initial persuasive message allows participants to create counter-arguments, strengthening the attitude against future attacks and increasing their confidence in the initial attitude. A meta-analysis of 54 research papers revealed that inoculation was effective in conferring resistance to persuasion even when novel attacks were used in the second persuasive attempt, concluding that inoculation fosters resistance to attitude change (Banas & Rains, 2010).

Research suggests that the persuasive impact of a message, and subsequently the route in which it is taken, is influenced by the modality in which the message is displayed (Muscanell, 2009). It is the communication modality that influences the effectiveness and hence the interpretation of the persuasive messages. Text-based CMC (where the modality

147

restricts richness of non-verbal cues, and thus leaves individuals focussing heavily on the written content and arguments presented) often engages the cognitively-demanding central route of the persuasion process. The medium automatically restricts social and source cues, thus constraining opportunities to assess quality and intended meaning of the persuasive message in order to make their decision. Subsequently, this restricting of non-verbal nuances is thought to lead to the message being centrally processed and enhancing systematic consideration than if it were presented FtF (Guadagno & Cialdini, 2002; 2007).

As a result of the active process of inoculation, resistance requires systematic processing and engagement of the messages being exchanged, thus suggesting persuasion via the central route of processing (text-based CMC) will be more likely to inoculate and resist persuasive attacks if compared to FtF exchanges (thought to be processed in a primarily heuristic manner).

5.3 Ethnicity

According to Hall (1981), collectivist countries rely primarily on situational information and non-verbal cues to inform their interactions. As such, communicating online through CMC could negatively impact such individuals. Setlock, Fussell, and Neuwirth (2004) found collectivist dyadic pairs took longer in their online exchanges to reach a consensus. This appeared to be an attempt to create a deeper cognitive agreement between the collectivist individuals. On the other hand, Setlock, Quinones, and Fussell (2007) found cultural differences were reduced but not eliminated when the persuasive message was presented using instant messaging software compared to FtF. The equalisation hypothesis (Dubrovsky et al., 1991) would suggest that any differences attributable to surface-level group membership such as ethnicity will be reduced or even eliminated when interacting anonymously, and thus any differences in ethnic persuasion outcomes will produce null results in this modality. Given that figures suggest that Asian

countries contribute to over half of all internet users (Internet World Stats, 2018), it would be remiss to exclude the impact of ethnicity on DMs, given its access to enhanced collaboration and communication across vast distances.

5.4 Gender

The majority of research investigating gender could be considered outdated, with gender roles within society changing vastly since the inception of such studies and the increasing role that technology and social media plays within everyday communication. For example, it has been reported that women actually outnumber men in terms of their social media usage (Kimbrough et al., 2013; Pew Research Center, 2015), which is a vast increase from reports of female internet users at 5% in 1992 (Sproull, 1992, cited in Ebben & Kramarae, 1993). Kimbrough et al. (2013) investigated gender differences within CMC, with the aim of understanding the motivations behind male and female use of technology for communicating. Kimbrough and her colleagues found that males and females use technology to a similar extent, but the purposes behind this use differed between the sexes. Females use the technology to maintain relationships and social interactions, whereas the males are noted to use the internet as a source for facts and information, focussing on task activities such as reading the news. It strengthens the Social Roles Theory and supports the view that men aim to achieve agentic goals compared to females' communal objective when communicating. This is despite the fact that technology provides freedom in terms of behaviour and interactions during online communications. It is therefore predicted that anonymity within this DM will hinder the female goal to achieve and maintain a relationship, whereas men will not be as affected by this restriction in media cues, thus not affecting male persuasive outcomes (see Guadagno & Cialdini, 2002; 2007).

149

5.5 Linguistic Style

McLeod and Elston (1995) noted differences in the use of persuasive linguistic devices between anonymous and identified individuals conversing online during a jury discussion. For example, anonymous individuals being much more direct in their style. Herring (1996) found that males were more likely to assert opinions as facts and use crude language in the online space. However, this study only looked at Caucasian individuals using self-report questionnaires and so a direct observation of language in DM is necessary. Nevertheless, Fullwood, Melrose, Morris, and Floyd (2012) support Herring's claims, finding that males were more likely to swear in online blogs.

5.6 The Present Study

This research utilises synchronous instant messaging software, enabling interaction to occur in real-time. The aim being to investigate CMC latency on persuasion outcomes, enabling a comparison with previous research, which has typically utilised asynchronous email conditions. Given that CMC interferes with the social motivations of females by restricting non-verbal cues and diminishing the establishment of social intimacy and relationships, it is hypothesised that:

1. Female persuasion will be negatively affected when interacting in CMC, leading to reduced persuasive outcomes compared to males.

2. Given the anonymity that the instant messenger software will afford, it is hypothesised that persuasion outcomes as a function of surface-level ethnicity will not differ.

Regarding the other variables of interest (cognitive and linguistic style), no specific hypotheses are made here due to limited research on these areas within a synchronous CMC modality.

5.7 Method

    5.7.1 Participants. Sixty-four mock-juror participants took part in the current study. Participants self-identified their ethnic background as either British (16 British males, 16 British females) or South-Asian (16 Asian males and 16 Asian females). The South-Asian self-reported sample consisted of 20 Indian, 7 Pakistani, 2 Bangladeshi, 2 Nepalese, and 1 Sri Lankan participants. The British self-reported sample consisted of 30 English and 2 Scottish participants. Ages ranged from 20 to 63, with a mean of 26.92 years (*SD* = 10.10). This study consisted of nine mock-juror confederates (3 British females, 1 British male, 3 South-Asian males and 2 South-Asian females), who had a mean age of 21.55 years (*SD* = 2.45). Participants and confederates were recruited using opportunity and snowball sampling in the West Midland, North-West and London areas. Participants were given the choice between receiving course credits (if they were studying psychology at either the University of Wolverhampton or Westminster) or being paid £10.00 for their time. The confederate mock-jurors were paid £5 per mock juror for participating in the research.

    5.7.2 Materials. Google Hangouts was used as the synchronous computer-mediated modality, which provides an instant messaging service through the Gmail website or mobile app for two or more users. This can be accessed online via a number of platforms including mobile, tablet and computers thus allowing ease of access to multiple participants. Whilst participants converse and type, speech bubbles appear on screen to

represent the conversational partner responding and these conversations can be saved and synced across devices, with the timing of previous messages also being visible on the screen (see figures 5.1-2). This particular platform was chosen as it facilitated instant messaging akin to social media and being free to access on multiple, wifi-enabled devices. Further features include the ability to converse using three-way interactions, use emoji's and avatar's, monitor and record conversations, and allow the exchange of files through the email facility. Additionally, it facilitated the creation of new, anonymous accounts for each participant for added security.

5.7.3   Procedure. Participants were sent an email once they had completed Session 1 (see Chapter 4 procedure), containing key information about a new Gmail account to which they were instructed to log into at a scheduled time. This allowed anonymity for the participants, meaning they were only identifiable by a participant number. Additional questions were added to Session 1 which included a subjective measure of how confident participants were in using a computer (from 1 *completely confident*, to 5 *not at all confident*) and how often participants used a computer, on average, per week (from *0-10 hours* per week, to *> 50 hours* per week). The information sheet was provided in the email inbox 24 hours prior to the study.

At the scheduled time, the researcher opened a new chat window using the Google Hangout feature, supported by Gmail, and explained how the study would be run, reiterating the format of the research and asking for consent. The same procedure used in the FtF study was employed here, whereby the jury booklet was provided to participants. This was accessed using an online link to the information as well as an online link to the pre-deliberation questionnaire. Once the participant had acknowledged that they had completed these tasks, a second chat window was opened, enabling a three-way conversation: containing the researcher, confederate and participant. The same instructions

were given as in Study 1 (see Appendix N), and it was emphasised that the researcher was available throughout for any questions. Both the confederate and participant were only identifiable by a participant number and thus the conversation remained anonymous throughout. Once the discussion had been completed, the confederate was let go on the pretence of completing the same post-deliberation questionnaire as the participant, to which a link was again provided within the chat window. Once completed, the researcher sent the debrief via email and there was an opportunity for the participant to ask any further questions. Finally, the participant was thanked for their time and dismissed, and the participant's email account deleted.
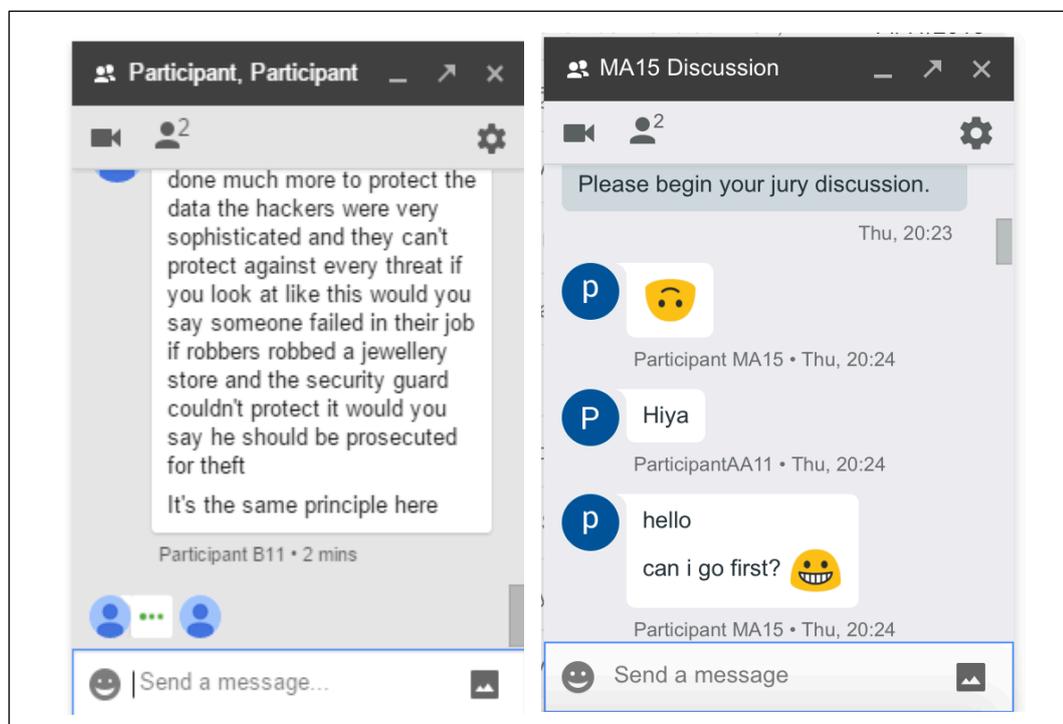
Figure 5.1. Screenshots of the Google Hangout Jury Discussion.
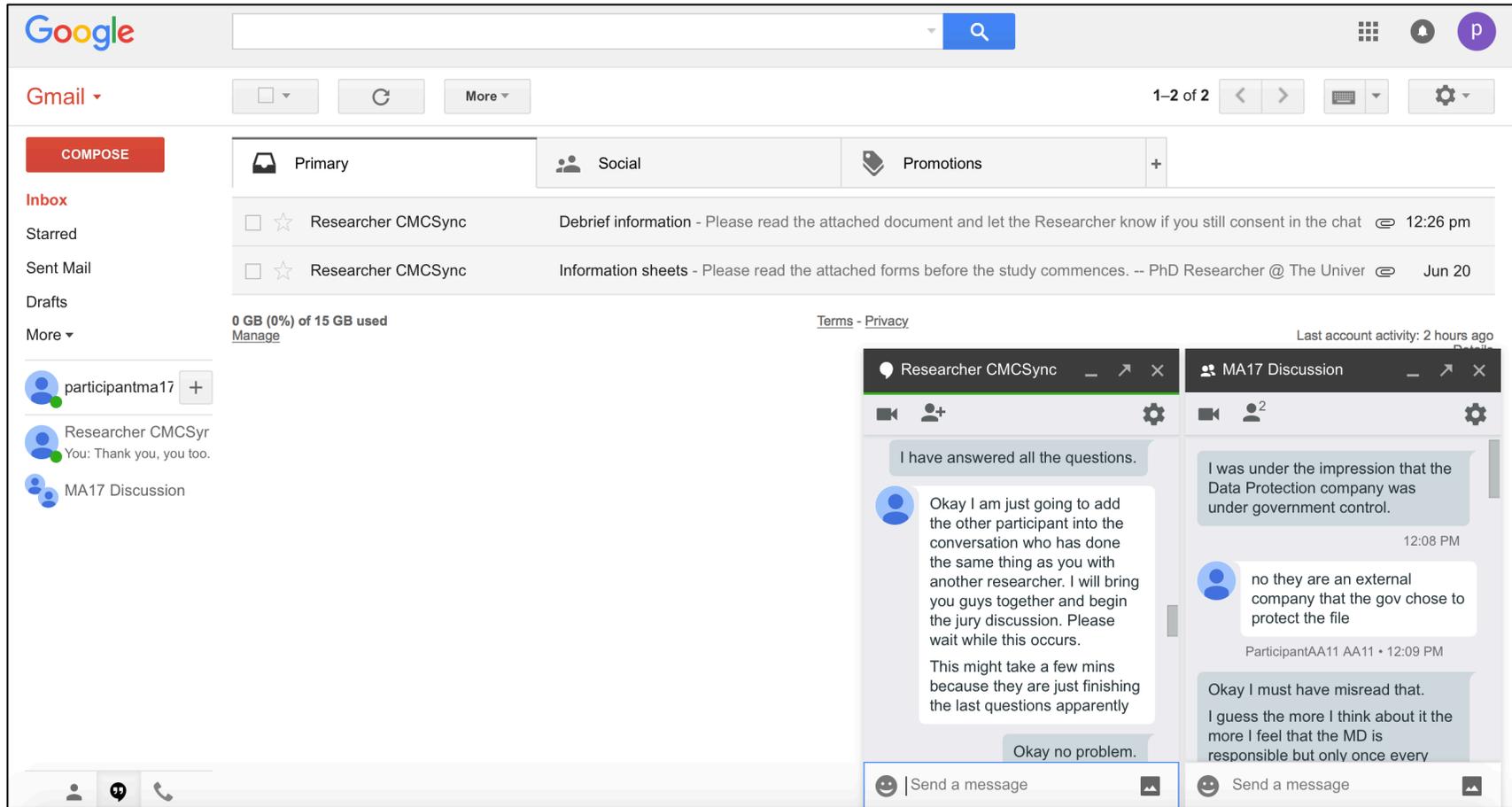
Figure 5.2. Participant screenshot of Gmail account, showing the email exchanges and Google Hangout chat windows.

5.8 Results

5.8.1 Mock-juror persuasion. Descriptive statistics show how significantly more mock-jurors resisted persuasion ($n = 43$; 67%) as a result of the jury discussion than mock-jurors who were persuaded ($n = 21$; 33%).

5.8.1.1 *Ethnicity and persuasion*. Overall, a test for independence chi-square showed no significant difference for persuasion outcomes, $x^2(1) = 1.77$, $p = .183$, $\varphi = .17$ (see Figure 5.3). South-Asian mock-jurors showed a similar breakdown of persuaded ($n = 10$) v. not persuaded ($n = 22$) as the British mock-jurors ($n = 11$; $n = 21$).
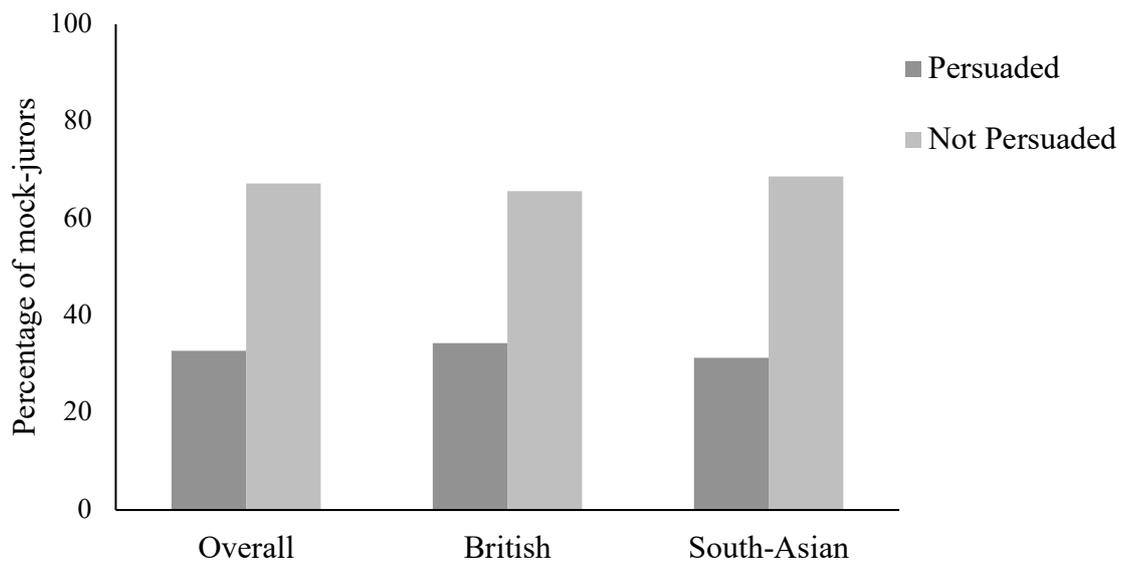
Figure 5.3. British ($n = 32$) and South-Asian *($n = 32$)* groups, compared to the overall sample ($n = 64$) for persuasion outcomes.

5.8.1.2 *Gender and persuasion*. Descriptive statistics revealed 41% of females were persuaded, double the rates for male persuasion, at just 25%. A test for independence revealed a non-significant result for gender and persuasion, $x^2(1) = 1.77$, $p = .183$, $\varphi = .17$ (see Figure 5.4).
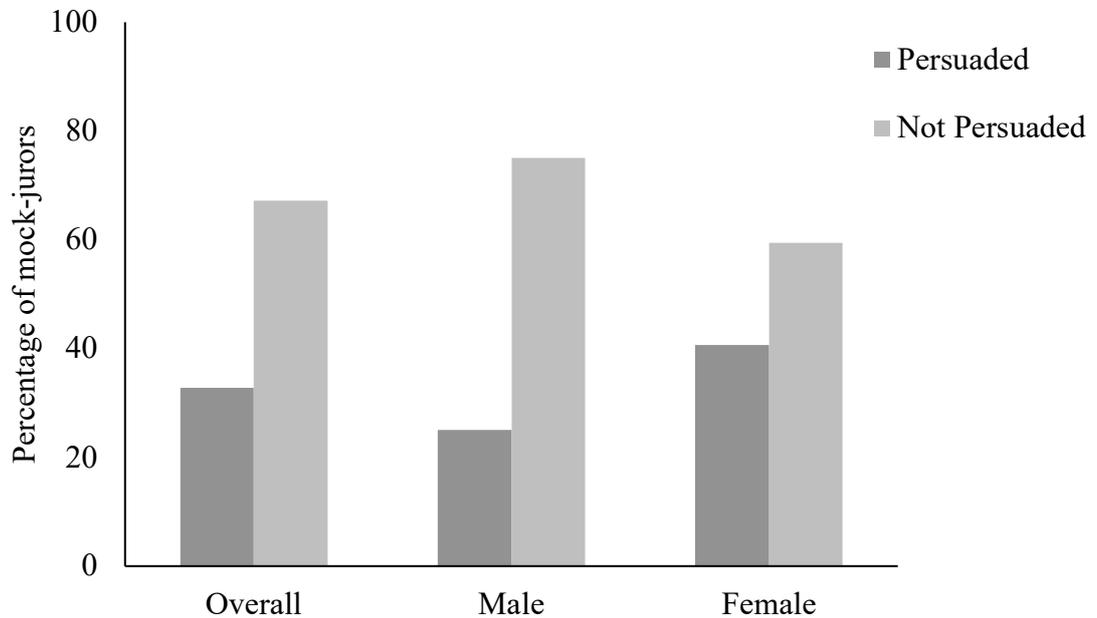
Figure 5.4. Male ($n = 32$) and Female ($n = 32$) groups, compared to the overall sample ($n = 64$) for persuasion outcomes.

5.8.1.3 *Ethnicity, gender, and persuasion.* A Fisher's Exact test revealed non-significant results for the persuaded outcome when broken down by gender and ethnicity, $x^2(1) = 1.15$, p $= .387$, $\varphi = .23$. Likewise, a chi-square test for independence revealed a non-significant result for the not-persuaded outcomes, $x^2(1) = .68$, p $= .432$, $\varphi = .12$ (see Figure 5.5).
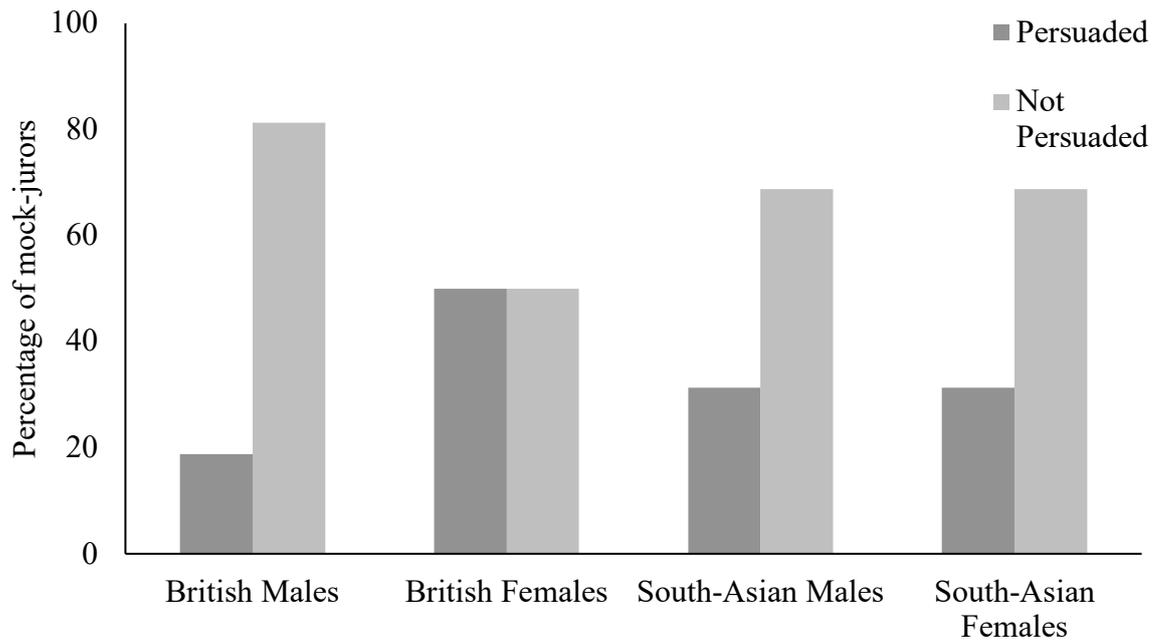
Figure 5.5. Persuasion as a function of Ethnicity and Gender (*n* = 64).

5.8.2 Confidence in verdict choice. To analyse whether subjective confidence influenced persuasion, univariate ANOVAs were conducted on the pre- and post-discussion confidence ratings. Confidence was analysed separately for the two different time points (before and after the jury discussion) to enable a comparison for persuasion within the separate time entities (see Table 5.1). The only significant result was in the post-discussion confidence ratings, with persuaded mock-jurors scoring significantly lower on their subjective confidence in the final verdict choice than those who were not persuaded.

Table 5.1

Descriptive and inferential statistics for pre- and post-discussion confidence ratings in verdict choice across Gender, Ethnicity and Persuasion

Factor	Levels	Pre-Discussion (%)				Post-Discussion (%)			
		M	*SD*	*F*	*p*	*M*	*SD*	*F*	*p*
Persuasion	Persuaded	61.90	21.82			59.52	21.62		
				3.19	.08			14.99	<.001
	Not Persuaded	73.26	22.75			81.98	20.65		
Gender	Male	73.44	20.02			82.03	20.31		
				1.19	.28			2.21	.14
	Female	65.62	25.2			67.19	24.13		
Ethnicity	British	73.44	21.00			77.34	23.21		
				3.35	.07			.29	.59
	South-Asian	65.62	24.39			71.87	23.55		

Note. M = mean; *SD* = standard deviation; *F* = univariate ANOVA statistic; *p* = significance value.

5.8.2.1 *Percentage change in confidence of verdict choice.* Univariate ANOVAs were computed for the absolute change score conversions (see Chapter 3). There were non-significant effects for gender, $F(1,62) = .71$, $p = .403$, ethnicity, $F(1,62) = .25$, $p = .616$, and cognitive style, PDI-R: $F(1,62) = .17$, $p = .680$, NfCC: $F(1,62) < .01$, $p = 1.00$. However, the ANOVA for persuasion revealed a significant main effect, $F(1,62) = 6.05$, $p = .017$, $\eta_p^2 = .30$, 95% CI [13.91, 22.81]. Analysis of the means revealed that those who were persuaded had a mean confidence change score of 26.19 (*SD* = 21.62, 95% CI [16.35, 36.03]) whereas those who were not persuaded had a mean confidence change score of 14.53 (*SD* = 15.65, 95% CI [9.72, 19.35]).

To understand the direction of confidence change and whether this differed across the persuasion groups, standardized residuals were calculated and analysed (see Table 5.2).

Table 5.2

A 3x2 contingency table for the frequency data (n) and standardised residuals (z) for

persuasion and direction of confidence

		Direction of absolute confidence in verdict choice		
		Increased	Decreased	No Change
Persuaded	N	13	2	6
	z	6.0*	-5.0*	-1
Not Persuaded	N	18	4	21
	z	3.7*	-10.3*	6.7*

*Note. *p < .001.*

Table 5.2 also shows the descriptive statistics of the direction of confidence change,

highlighting that the majority of the persuaded group (61.9%) increased their confidence

post-discussion, despite changing their verdict. 41.9% of the not-persuaded sample

increased in their confidence, whilst 48.8% showed no change in confidence (compared to

22.2% for those persuaded).

To understand whether the direction of confidence change significantly differed

across persuasion, a Fisher-Freeman-Halton test for independence was conducted. This

revealed a non-significant effect, $x^2(1) = 2.54$, $p = .280$, showing that direction of

confidence change did not differ when comparing across persuasion groups.

5.8.3 Mock-juror cognitive style. Table 5.3 shows the summary and inferential

statistics for cognitive style measures across persuasion, gender and ethnicity. The table

reveals one significant result - South-Asian mock-jurors scored higher in delusional thinking on average, when compared to British mock-jurors.

Table 5.3

Summary descriptives of the total PDI-R and NfCC total scores as a function of Gender, Ethnicity and Persuasion

Factor	Level	NfCC				PDI-R			
		M	*SD*	*F*	*p*	*M*	*SD*	*F*	*p*
Gender	Male	154.78	20.29			50.48	36.82		
				1.48	.228			1.05	.311
	Female	160.69	18.50			42.44	24.62		
Ethnicity	British	157.09	19.12			35.97	29.25		
				.07	.795			8.08	.006
	South-Asian	158.37	20.14			57.16	29.49		
Persuasion	Persuaded	160.19	16.06			47.28	25.55		
				.49	.486			.02	.875
	Not Persuaded	156.53	21.04			45.95	34.00		

To investigate whether the two measures are correlated, a Spearman's Rho correlation was analysed on the total scores across the two scales. This was chosen due to the parametric assumptions of normality being violated (skewness = .922, standard error = .302) but revealed a non-significant relationship between the two measures, r = .10, p = .442.

5.8.3.1 *High and low in cognitive style*. The distribution of the NfCC scores ranged from 107 to 207. Mock-jurors who scored in the highest or lowest quartiles for

160

cognitive style were categories as high or low in each measure. Sixteen participants were considered 'high' in their NfCC ($M = 180.69$, $SD = 10.14$) and 16 were classed as low in the NfCC ($M = 132.56$, $SD = 9.89$). The distribution of PDI-R scores ranged from 0 to 146. As above, those scoring in the top and bottom quartiles were classified as high or low in their delusional thinking (*high*: $M = 90.07$, $SD = 25.02$; *low*: $M = 12.47$, $SD = 7.06$). Univariate ANOVAs were conducted to investigate any differences in those high or low in their cognitive style for duration, and pre- and post-confidence. Chi-square analyses were conducted on the high and low categories to understand and analyse any differences in persuasion outcomes (see Table 5.4). These all revealed non-significant effects.

Table 5.4

Descriptives and inferential analyses of high and low cognitive styles, as a function of duration, pre- and post-confidence, and persuasion

Source		Group Comparison		Statistic	p	Effect Size
		High	Low			
PDI-R						
	Duration	$M = 1863.75$ $SD = 768.21$	$M = 1522.50$ $SD = 552.03$	$F = 2.08$	.159	$\eta_p^2 = .25$
	Pre-Confidence	$M = 64.06$ $SD = 22.30$	$M = 71.87$ $SD = 20.16$	$F = 1.08$	.307	$\eta_p^2 = .19$
	Post-Confidence	$M = 67.19$ $SD = 25.36$	$M = 75.00$ $SD = 18.26$	$F = 1.00$	.325	$\eta_p^2 = .18$
	Persuasion	N P = 6 N NP = 10	N P = 4 N NP = 12	$\chi^2 = .58$	.704	$\varphi = .13$
NfCC						
	Duration	$M = 1547.14$ $SD = 513.07$	$M = 1817.65$ $SD = 897.44$	$F = 1.00$	.326	$\eta_p^2 = .18$
	Pre-Confidence	$M = 66.07$ $SD = 28.77$	$M = 67.65$ $SD = 21.22$	$F = .03$	.862	$\eta_p^2 = .03$
	Post-Confidence	$M = 69.64$ $SD = 28.04$	$M = 79.41$ $SD = 20.22$	$F = 1.27$	.27	$\eta_p^2 = .20$
	Persuasion	N P = 5 N NP = 9	N P = 4 N NP = 13	$\chi^2 = .55$	.693	$\varphi = .13$

5.8.4 Duration of jury discussion. The duration of the jury discussion was measured in seconds, from the moment the researcher stated the mock-jurors could begin the discussion, until the moment a decision was unanimously reached (be that an agreement, or termination of the chat). The average length of the jury discussion by ethnicity was analysed and found that the assumption of homogeneity of variances had been violated (Levene's < .05). Therefore, the Welch's F test was utilised. This revealed a significant main effect for duration, *Welch's F* $(1, 62) = 14.79$, $p < .001$, $\eta_p^2 = .44$, 95% CI [1445.02, 1826.85] whereby British mock-jurors spoke for longer on average ($M = 1968.75$ seconds, $SD = 861.76$, 95% CI [1658.05, 2279.45]), than the South-Asian mock-jurors ($M = 1303.12$ seconds, $SD = 464.57$, 95% CI [1135.63, 1470.62]). Persuasion also revealed a significant main effect for duration, $F (1, 62) = 7.21$, $p = .009$, $\eta_p^2 = .32$, 95% CI [1445.02, 1826.85]. Further analysis of the means revealed that those who were not persuaded talked for longer ($M = 1806.98$ seconds, $SD = 739.06$, 95% CI [1579.53, 2034.42]) than those who were persuaded ($M = 1285.71$ seconds, $SD = 708.04$, 95% CI [963.42, 1608.01]). No significant main effects for gender, $F (1, 62) = .06$, $p = .808$, or cognitive style (high or low) for PDI-R, $F (1, 29) = 1.00$, $p = .326$, or NfCC, $F (1, 62) = 2.08$, $p = .159$, as a function of duration emerged.

5.8.5 Mock-juror linguistic analysis.

5.8.5.1 *Word count.* To investigate whether word count (WC) differed as a function of persuasion, cognitive style, ethnicity and gender, and whether this differed to results reported under 'Duration', a series of univariate ANOVAs were conducted. Analysis of the means showed that British mock-jurors said, on average, 423 words ($SD = 259.63$, 95% CI [329.39, 516.61]) compared to the South-Asian participants, who spoke almost half this number throughout the jury discussion ($M = 277.75$, $SD = 151.65$, 95% CI

[223.07, 332.42]). This resulted in a significant inferential finding for ethnicity, $F(1, 62) = 7.47$, $p = .008$, $\eta_p^2 = .33$, 95% CI [294.61, 406.14].

Similar to the duration of the jury discussion, persuasion also revealed a significant difference in WC. Persuaded participants spoke approximately 50% fewer words ($M = 241.00$, $SD = 145.66$, 95% CI [174.69, 307.30) than participants who resisted the persuasive messages from the confederate mock-juror ($M = 403.79$, $SD = 236.13$, 95% CI [331.12, 476.46]), $F(1, 62) = 8.38$, $p = .005$, $\eta_p^2 = .34$, 95% CI [294.61, 406.14]. Gender, $F(1, 62) = 3.02$, $p = .087$, and cognitive style (high or low) in PDI-R, $F(1, 29) = 1.45$, $p = .239$, and NfCC, $F(1, 30) = .61$, $p = .440$, did not significantly differ.

5.8.5.2 *LIWC categories*. A series of between-factor MANOVAs were performed on the LIWC categories as a function of ethnicity, gender, persuasion and cognitive style. Non-significant interactions were found for Gender, Wilks's $\Lambda = .92$, $F(10, 53) = .44$, $p = .921$, and cognitive style: NfCC (high or low) Wilks's $\Lambda = .75$, $F(10, 21) = .69$, $p = .72$, and PDI-R (high or low, where Box's M implied that the assumption of equal covariances were not met, and thus the more conservative Pillai's trace was utilised: see Tang & Algina, 1993; Field, 2013) Box's $M = 125.66$, $F(55, 2495.47) = 1.40$, $p = .03$, Pillai's trace $= .35$, $F(10, 20) = 1.08$, $p = .42$.

A significant interaction emerged for Ethnicity, Wilks's $\Lambda = .64$, $F(10, 53) = 2.94$, $p = .005$, $\eta_p^2 = .36$. Subsequent univariate ANOVAs and their descriptive statistics are presented in Table 5.5. Significant main effects (adjusting for Bonferroni's correction) were found for affective and informal language. The South-Asian sample used more informal language during the jury discussion and had greater frequency of affective language than the British mock-jurors.

Table 5.5

Descriptive statistics and follow-up ANOVAs showing the main effects of linguistic style

for ethnic groups (n = 64)

Linguistic Category	Ethnicity		Inferential statistic	Significance value	Effect size
	British	South-Asian	F	p	η_p^2
Analytical Thinking	$M = 29.96$ $SD = 14.55$	$M = 31.02$ $SD = 18.20$	.07	.796	.07
Clout	$M = 45.53$ $SD = 16.06$	$M = 51.16$ $SD = 19.35$	1.59	.212	.02
Authentic	$M = 29.15$ $SD = 19.35$	$M = 27.11$ $SD = 21.27$	.16	.689	<.01
Tone	$M = 36.46$ $SD = 25.82$	$M = 36.61$ $SD = 26.08$	<.01	.965	<.01
Total Function words	$M = 61.56$ $SD = 3.35$	$M = 59.42$ $SD = 3.09$	7.05	.010	.10
Affective processes	$M = 6.33$ $SD = 2.01$	$M = 8.21$ $SD = 2.30$	12.09	.001	.16
Social processes	$M = 9.79$ $SD = 2.18$	$M = 10.53$ $SD = 2.79$	1.40	.242	.02
Cognitive Processes	$M = 19.30$ $SD = 3.65$	$M = 18.53$ $SD = 3.16$	.81	.370	.01

	Persuasion				
Drives	$M = 7.71$ $SD = 1.88$	$M = 8.75$ $SD = 2.52$	3.46	.068	.05
Informal Language	$M = 1.64$ $SD = 1.38$	$M = 2.99$ $SD = 2.03$	9.74	.003	.14

Additionally, the between-factor MANOVA revealed a significant interaction for Persuasion across the themed categories analysed using LIWC, Box's $M < .05$, Pillai's trace = .35, $F(10, 53) = 2.87$, $p = .006$, $\eta_p^2 = .35$. Subsequent univariate ANOVAs (adjusting for Bonferroni's correction) revealed significant main effects for affect, cognitive processing and informal language (see Table 5.6). As highlighted below, this shows that the persuaded group had a larger frequency of cognitive processing and informal language when compared directly to the non-persuaded groups.

Table 5.6

Main effects and descriptive statistics of Persuasion for linguistic style (n = 64)

Linguistic Category	Persuasion		Inferential statistic	Significance value	Effect size
	Persuaded	Not-Persuaded	F	p	η_p^2
Analytical Thinking	$M = 29.87$ $SD = 19.86$	$M = 30.80$ $SD = 14.60$	.04	.834	<.01
Clout	$M = 49.67$ $SD = 18.18$	$M = 47.70$ $SD = 18.17$	.17	.684	<.01
Authentic	$M = 29.72$ $SD = 21.17$	$M = 27.35$ $SD = 19.91$	.19	.663	<.01

Tone	$M = 43.76$ $SD = 28.56$	$M = 33.12$ $SD = 23.82$	2.47	.121	.04
Total Function words	$M = 59.80$ $SD = 4.26$	$M = 60.83$ $SD = 2.84$	1.31	.257	.02
Affective processes	$M = 8.15$ $SD = 2.02$	$M = 6.83$ $SD = 2.39$	4.73	.034	.07
Social processes	$M = 10.16$ $SD = 2.40$	$M = 10.16$ $SD = 2.59$	<.01	.991	<.01
Cognitive Processes	$M = 20.66$ $SD = 2.79$	$M = 18.07$ $SD = 3.40$	9.19	.004	.13
Drives	$M = 8.01$ $SD = 2.07$	$M = 8.34$ $SD = 2.37$	.293	.590	<.01
Informal Language	$M = 3.52$ $SD = 2.25$	$M = 1.17$ $SD = 1.29$	16.59	<.001	.21

Given the significant findings reported for WC, ethnicity, and persuasion (above), two between-factor MANCOVAs were run to understand whether controlling for WC would alter the findings reported. The between-factor MANCOVA for ethnicity revealed a significant interaction with the LIWC themes, Wilks's $\Lambda = .69$, $F(10, 52) = 2.29$, $p = .026$, $\eta_p^2 = .31$. Similarly, the MANCOVA for persuasion also remained constant, revealing a significant effect across the LIWC themes, Wilks's $\Lambda = .70$, $F(10, 52) = 2.17$, $p = .034$, $\eta_p^2 = .29$. This indicates that despite WC differing across ethnicity and persuasion groups, this did not significantly alter findings when analysing LIWC categories, when controlling WC as a covariate.

5.8.5.3 *Confidence in linguistic style.* As mentioned previously, the confidence epistemic dictionary was used in LIWC to analyse confidence in speech, expressed as a percentage of the total words within each discussion. A 2 (Gender: male v female) x 2 (Ethnicity: south-asian v british) x 2 (Persuasion: persuaded v not-persuaded) MANOVA was conducted for mock-jurors on the two DVs (high and low in linguistic confidence). The assumption of equal covariances was not met (Box's $M = 56.52$, $F(21, 1391.96) = 2.22$, $p = .001$) for this test. The subsequent findings revealed non-significant multivariate effects for gender, Pillai's trace $= .01$, $F(2, 55) = .19$, $p = .826$, and ethnicity, Pillai's trace $= .01$, $F(2, 55) = .29$, $p = .747$. However, persuasion revealed a significant multivariate effect, Pillai's trace $= .23$, $F(2, 55) = 8.19$, $p = .001$, $\eta_p^2 = .23$. Subsequent between-factor ANOVAs revealed a significant main effect for low confidence, $F(1, 56) = 9.80$, $p = .003$, $\eta_p^2 = .15$, 95% CI [1.76, 2.36]. Descriptive statistics show that the persuaded mock-jurors had a higher frequency of low confidence words in their speech writing ($M = 2.71$, $SD = .27$, 95% CI [2.18, 3.25]) compared to mock-jurors who were not persuaded ($M = 1.71$, $SD = .18$, 95% CI [1.36, 2.07]). There were no significant interactions for gender x ethnicity, Pillai's trace $= .01$, $F(2, 55) = .14$, $p = .87$, gender x persuasion, Pillai's trace $= .01$, $F(2, 55) = .34$, $p = .71$, ethnicity x persuasion, Pillai's trace $= .01$, $F(2, 55) = .23$, $p = .79$, or gender x ethnicity x persuasion, Pillai's trace $< .01$, $F(2, 55) = .06$, $p = .94$.

To analyse the interaction between dyadic pairings and persuasion, a 2 (Dyadic pairing: mock-juror v confederate mock-juror) x 2 (Persuasion: persuaded v not-persuaded) MANOVA on confidence in speech (high and low) was conducted. Findings showed a non-significant main effect for dyadic paring, Wilks's $\Lambda = .98$, $F(2, 123) = .97$, $p = .381$. However, persuasion was significant, Wilks's $\Lambda = .80$, $F(2, 123) = 14.90$, $p < .001$, $\eta_p^2 = .19$, mirroring the findings above. The dyadic pairing x persuasion interaction was non-significant, Wilks's $\Lambda = .97$, $F(2, 123) = 1.55$, $p = .216$. These results indicate that

confidence does not significantly differ for mock- and confederate mock-jurors for persuaded or non-persuaded interactions.

5.8.5.4 *Linguistic style matching.* To investigate the hypothesis that LSM would be higher in persuaded interactions, a comparison of the mean total LSM scores was conducted. The independent t-test revealed no differences in mean total LSM scores for persuasion, t (62) = -1.68, p = .098.

5.8.5.4.1 *LSM over time*. The jury interactions were split into even quartiles to observe any differences in LSM over the course of the jury discussion. A 2 (Persuasion: persuaded v not-persuaded) x 4 (Time 1 v 2 v 3 v 4) mixed-factor ANOVA revealed non-significant main effects for time, F (3, 186) = .41, p = .689, and persuasion, F (1, 62) = 2.24, p = .140. Additionally, there was a non-significant time x persuasion interaction, F (3, 186) = 1.76, p = .156, indicating that LSM did not significantly differ across the duration of the jury discussion for persuaded vs. not-persuaded groups.
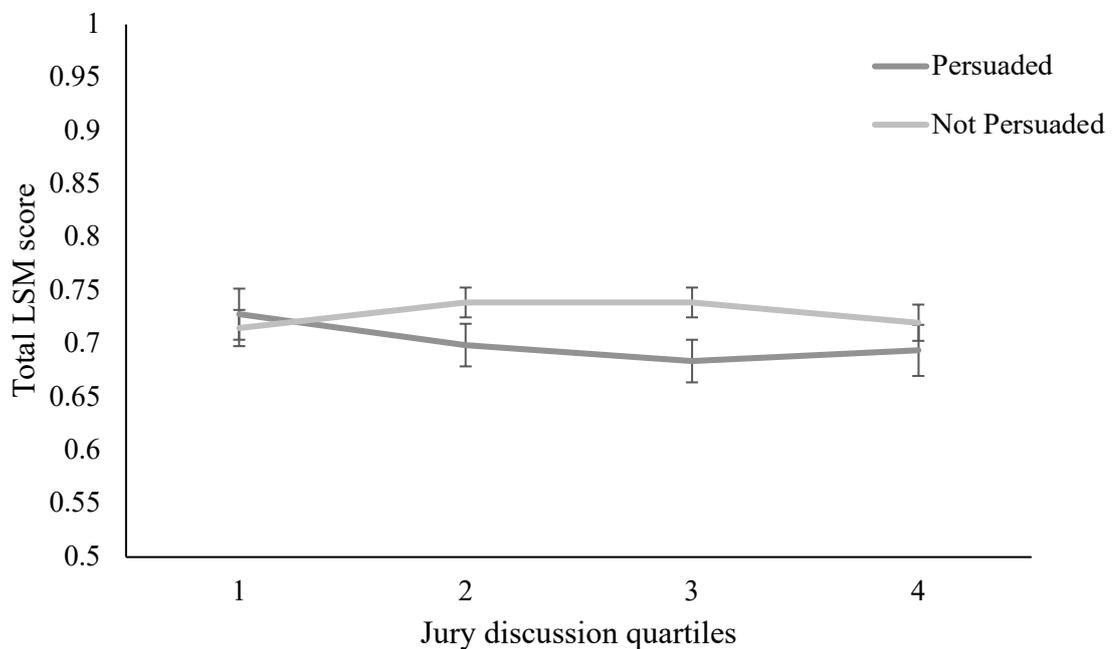
Figure 5.6. Mean LSM scores per quartile of the jury discussion by Persuasion. Error bars denote ± 2 SE (standard error of the mean).

5.8.6   Mock-juror qualitative content analysis (QCA). The exploration of the

content analysis codes is presented below. A complete summary table of the breakdown of

each code, and the IVs (*ethnicity*: South-Asian v British; *persuasion*: persuaded v not

persuaded; *gender*: male v female; and *cognitive style*: NfCC high v NfCC low; PDI-R

high v PDI-R low) are reported in full in Appendix M2, highlighting the coding

frequencies and percentage responses across each category.

5.8.6.1   Descriptive group comparisons for the pre-questionnaire.

Theme 1: Facts used to inform decision-making. When looking at the overall data

sample, more mock-jurors used the prosecution's arguments and expanded on this

evidence (QCA codes 2 [18.8%]; 202 [21.9%]) compared to those who relied on the

defence's argument (QCA code 1 [10.9%]; 101 [15.6%]). Interestingly, the highest scoring

category for mock-jurors who were persuaded was the use of background information

(QCA code 4; 23.8%), followed closely by individual interpretation of the case file

summary (QCA code 3). This suggests that mock-jurors who were persuaded to change

their decisions initially used information that is considered much broader in scope, rather

than focussing and expanding on the specific arguments for and against the defendant's

stated crime. In support of this, the majority of those who were not persuaded were more

likely to fall within QCA codes 1, 101, 2, and 202.

Theme 2: References to the accused. Across all the IVs of interest depicted in

Appendix table M2, mock-jurors tended to fall within the category where references are

made only to the company as a collective ('*the company', 'they'*). The exception being

37.5% of mock-jurors scoring low in NfCC, who mention both the company and the

individual/defendant within their written reasoning, perhaps in an attempt to cover all possible reasoning and thus fulfilling their desire to suspend judgmental commitment.

Theme 3: Reasoning for verdict choice. Not many mock-jurors mentioned moral reasoning for their choice in verdict (QCA code 8). However, there was a difference in the distribution of those falling within this category when broken down by gender, with 12.5% (n =4) of females referencing fairness and ethics when justifying their decisions ('*I believe it is worse to sentence an innocent man than to let a guilty man go free*' [FB12]). This is compared to just 1 male (3.1%) who similarly justified his verdict choice of not guilty using the reasoning depicted in QCA code 8 [MA8]. Also, of interest here was the lack of mock-jurors either high or low in cognitive style giving reference to a lack of evidence when qualifying their decisions pre-discussion (QCA code 12). On average, most mock-jurors, despite being persuaded or not, reasoned that either the company was negligent due to them simply not fulfilling the contract/providing a service (for the guilty verdicts: QCA code 9) or went beyond the case file and used real-world knowledge/scenarios to explain how the company/defendant was not at fault for the events that took place (QCA code 142; not-guilty verdicts). Thus, with regards to persuasion, there were no particular differences in reasoning styles pre-discussion, and the codes that mock-jurors fell into imply a focused thought process (with no-one in the current study commenting that they went for the easier option to ease cognition (QCA code 11).

Theme 4: Attribution of responsibility. Overall, there is an even spread when it comes to participants attribution of blame. No-one who scored highly on the NfCC scale attributed responsibility to 'others' (QCA code 701: examples include the Government and media). In contrast, 25% of mock-jurors who were low on this measure fell into this category. This pattern is reversed when the comparison is made for delusional thinking, with no one low in the measure falling into code 701, but 14.3% of mock-jurors high in

PDI-R did. This seemingly reiterates the findings above showing that the two cognitive style measures do not have a relationship (are not correlated).

Theme 1: Facts ignored in the decision-making process. This sub-category shows a similar spread of results, with a high proportion of the participants ignoring the background information when it comes to the decision-making process. This holds across all IVs. It should be noted however, that the non-persuaded mock-jurors had a higher degree of spread across the QCA sub-categories, seemingly ignoring more information compared to persuaded individuals, who primarily disregarded the background summary information (61.9%).

Theme 3: Reasoning for ignoring these facts. Irrespective of gender, ethnicity, cognitive style and persuasion, most individuals state they ignored the evidence they did due to it being unimportant and irrelevant to the decision being made. Seven non-persuaded mock-jurors (16.3%) claimed they ignored the evidence they did because it was weak and lacked certainty ('*No evidence of credibility*' [FB10]). However, no individual who was persuaded fell within this category (QCA code 12) potentially indicting that persuaded mock-jurors took on board most information presented to them, despite the case summary being overall neutral in its delivery. The non-persuaded individuals, on the other hand, stated that they discounted information if they deemed it to lack certainty.

5.8.6.2 Descriptive group comparisons for the post-questionnaire.

Theme 1: Facts used to inform decision-making. Similar to Theme 1 in the pre-questionnaire, a high percentage of mock-jurors continued to expand on the prosecution's argument. However, unlike the pre-questionnaire, 25% of mock-jurors made their decisions based on the lack of facts and evidence presented in the case summary file and used this lack of information to form their final verdict decision, '*On the basis of these facts, we agreed that more information was needed*' [MA17]; '*Based on lack of important*

information, it is very hard to say whether or not the managing director is guilty' [FB12].

Furthermore, groups low in cognitive style (both NfCC and delusional thinking) had a higher percentage of individuals falling into this category (31.3%, and 35.3% respectively) compared to mock-jurors high on these measures (25% high in NfCC; 21.4% high in PDI-R). It suggests that individuals with a propensity to jump to conclusions and need to shut down their cognitive decision-making as soon as possible are less likely to focus on the lack of evidence when informing their final verdict choice.

Another interesting observation came from the persuasion sub-groups. QCA code 401 depicts that the crux of the mock-juror's verdict being based on the fact that the defendant as an individual is being charged, be it placing blame on him specifically ('*Because as managing director, he gets paid to take on the responsibility'* [MB1]) or using the fact that he is being indicted as an argument against prosecuting. For example, '*Even in the highest levels of management, a person does not necessarily make decisions on the day to day minute. The 'leaker' of the delicate information is someone who had no previous record, criminal or otherwise, so how could the managing director predict what may or may not happen'* [FB6]. More than double the number of individuals fell within this category when there were not-persuaded (*n* = 7; 16.3%), compared to 9.5% (*n* = 2) persuaded mock-jurors. It seems that when mock-jurors develop their argument around their person at the heart of the prosecution case, it becomes harder to change their mind.

Theme 2: References to the accused. 44.2% of those not-persuaded focused solely on the managing director as an individual when referencing their decision, with less than half of this number (20.9%) falling into the opposing category whereby they only reference the company as an entity. Interestingly, these results are almost flipped for the persuaded group: 23.8% falling into QCA code 501 whilst 42.9% fall into 502. This infers that persuaded individuals have a holistic overview of the case, referencing the company as an entity compared to non-persuaded individuals who perhaps have a more directed focus,

which corroborates the findings in Theme 1 post-questionnaire, whereby non-persuaded individuals were more likely to fall into QCA code 401.

   Theme 3: Reasoning for verdict choice. Ethnicity have similar patterns of distribution within this category. For example, exactly 25% of the South-Asian sample stated that a lack of evidence contributed to their decisions. Likewise, 25% of the British sample indicated the same reasoning. However, when gender was broken down, this showed a difference for QCA code 12. 40.6% of the male sample reasoned that a lack of evidence led to their decision, '*I would say it is, more specifically, lack of evidence. It seems unwise to assume guilty when there isn't enough evidence to say to the contrary*' [MB3]. However, only 9.4% of the female sample ($n = 3$) used this argument. Compared to the pre-questionnaire question which asks the same thing, males increased their argument for this QCA code, indicating that the jury discussion with a female confederate (whether persuaded or not) led to men relying further on the lack of evidence presented, in comparison to the females interacting with a male confederate, despite the same arguments being presented by all confederate mock-jurors.

   Theme 4: Attribution of responsibility. More than half of the mock-jurors high in the NfCC and delusional thinking attributed blame on the managing director or company. However, mock-jurors who did not have the same urge to reach a conclusion had a higher percentage of individuals attributing blame to others. For example, '*Not all the defendant's fault, their experts said they couldn't have done anymore, the third party are all at fault*' [FB10]. It seems that mock-jurors who wish to reach a conclusion fast and achieve cognitive closure attribute blame to the 'obvious' candidate (i.e., the managing director being put on trial), whereas mock-jurors who score low on these measures instead put greater stock in discerning alternate blame.

   Theme 5: Persuasiveness of the confederate. 20.9% of mock-jurors who were not persuaded claimed the arguments presented (both during the jury discussion and the case

summary) were not directly relevant or were not strong enough to change their mind. 18.6% of the not-persuaded mock-jurors conceded however that the confederate did say some persuasive points, but this was not enough to change their mind, '*I do think that he made some good points, and used metaphor to good effect, but the persuasiveness was lessened by my impression that he hadn't distinguished between the facts of the case and what each of the defence and prosecution were arguing*' [MA16]. 57.1% of mock-jurors state that they were persuaded to change their decision as the confederate highlighted evidence that they had missed or challenged their viewpoint. For example, '*They made some persuasive points in that they were looking at the case from a different perspective than I was, and so brought some things I hadn't thought about to the table. These things were enough to make me think the defendant was guilty*' [MB12].

      Theme 6: Communication during the discussion. Overall, the highest scoring categories for mock-jurors within this theme comprised of finding the CMC communication friendly and pleasant (26.6%) or failing to comment on the communication at all (26.6%). Intriguingly, a higher percentage of individuals not persuaded specified that they found the communication awkward (11.6%) or rigid and argumentative (18.6%): '*It is a tough dialogue as we both had our points of view and were not willing to budge on those points of view*' [MB11]. This is in direct comparison to no-one in the persuaded mock-juror group mentioning that the discussion was difficult, and only 14.3% claiming the communication was, at times, rigid. This mirrors the comments relating directly to the CMC modality, with more non-persuaded individuals commenting on the synthetic modality than those who were persuaded. Interestingly, there was an even split for the non-persuaded mock-jurors between finding the communication easy and the environment positive (18.6%): '*It wasn't hard at all. The chat is a very easy way to communicate. The discussion was dynamic. Plus, the Gmail chat was very similar to the Facebook one so I found myself in a "usual" environment*' [FA10] to mock-jurors commenting on how

174

difficult and frustrating they felt the medium was to discuss the case (18.6%) '*The communication was generally slow, which made it kind of tedious*' [FB12]. This seems to appear across the IVs, with a fairly even split between positive and negative comments regarding the facilitation of a discussion using Google Hangouts.

   Theme 7: Additional comments. More than half of the participants did not provide any additionally comments (65.6%). Of those that did, 13.6% commented that they found the scenario realistic, and all of these were not persuaded to change their verdict. 13.6% commented that they wanted more time, whilst the same number commented that the study was too long and believed it was time-consuming.

   5.8.7   Computer confidence and average usage. To understand the baseline competency and confidence of the participant sample in their computer usage, and thus whether this might affect the results, a series of Mann-Whitney *U* tests were carried out on the subjective data concerning confidence self-ratings (measured on a Likert scale from 1 *completely*, to 5 *not at all*), and how often the mock-jurors used a computer, on average per week (from 1: *<10 hours,* to 6: *>50 hours*).

   The majority of mock-jurors were completely confident in their computer abilities (48.44%), with a mean rating of 1.92, whilst 11.1% of the sample rated their confidence in using computers as '*lacking*', or '*not at all*'. The subjective ratings of confidence in computer abilities did not significantly differ for males and females; *Gender U* = 426.50, *z* = -1.03, *p* = .302, *r* = -.13, British and South-Asian; *Ethnicity U* = 427.00, *z* = -1.02, *p* = .305, *r* = -.13, and persuaded and non-persuaded groups, *Persuasion U* = 424.00, *z* = -.27, *p* = .789, *r* = -.03.

   The majority of mock-jurors indicated that they use a computer for at least 2 hours a day (with 79.4% of the sample stating they use a computer for more than 20 hours per week), with a mean rating of 4.12 (out of 6). The subjective ratings for average weekly

175

computer usage did not significantly differ across Gender, $U = 447.00$, $z = -.89$, $p = .373$, $r = -.11$, Ethnicity, $U = 450.00$, $z = -.85$, $p = .395$, $r = -.11$, or Persuasion, $U = 448.00$, $z = -.05$, $p = .959$, $r < .01$.

5.8.8 Confederate mock-jurors. This section of results covers the confederate mock-juror analysis. Firstly, between-factor ANOVAs are used to analyse word count to examine any differences across the persuasion groups, as well as the confederates themselves. Secondly, ratings of the confederate mock-juror (made by the mock-jurors post-discussion) are analysed using non-parametric Mann Whitney U tests to help understand participant's perception of the anonymous interaction.

5.8.8.1 *Word count (WC).* To understand whether status (confederate or mock-juror) varied in their contribution to the discussion and thus wrote more/less as a function of persuasion outcome, a 2 x 2 between-factor ANOVA was conducted. This revealed a non-significant effect for status, $F (1, 124) = .20$, $p = .654$. Persuasion was significant, confirming the differences in WC for the two outcomes for mock-jurors above, but is not of relevance here ($p > .05$). Furthermore, the persuasion x status interaction was non-significant, $F (1, 124) = .73$, $p = .40$, indicating that neither the confederate nor the participant dominated the interactions and as a result, did not influence the persuasive outcomes.

5.8.8.2 *Social ratings of the confederate mock juror.* Mock-jurors were asked to rate their jury partner on a Likert scale from 1-5 concerning how friendly, aggressive and sociable they perceived their interaction. Mann Whitney U tests were carried out for ethnicity, persuasion, and gender but all revealed non-significant results indicating no differences in the perception of the jury partners when anonymous (all *p's* > .05).

176

Table 5.7 (continued overleaf)

Descriptive statistics and Mann Whitney U results for mock-jurors' ratings of the
confederate mock-juror, for ethnicity, gender and persuasion groups

| | Sociable | | | | |
	Median	*U*	*z*	*p*	*r*
Ethnicity	South-Asian = 2.0 British = 3.0	393.00	-1.69	.090	-.21
Gender	Male = 2.5 Female = 3.0	499.00	-.18	.853	-.02
Persuasion	Persuaded = 3.0 Not persuaded = 3.0	445.00	-.10	.922	-.01

Table 5.7 (continued)

Descriptive statistics and Mann Whitney U results for mock-jurors' ratings of the confederate mock-juror, for ethnicity, gender and persuasion groups

	Friendliness					Aggressiveness				
	Median	*U*	*z*	*p*	*r*	Median	*U*	*z*	*p*	*r*
Ethnicity	South-Asian = 3.0 British = 3.0	505.50	-.09	.927	-.01	South-Asian = 3.0 British = 3.0	487.00	-.39	.697	-.05
Gender	Male = 3.5 Female = 3.0	448.00	-.90	.368	-.11	Male = 3.0 Female = 3.0	509.00	-.05	.963	<.01
Persuasion	Persuaded = 3.0 Not persuaded = 3.0	436.00	-.23	.816	-.03	Persuaded = 3.0 Not persuaded = 3.0	429.50	-.36	.716	-.04

5.8.8.3 *Physical perceptions of the confederate mock-juror.* Given the anonymity of the jury interactions in this study, analysis of mock-jurors perceptions of their jury partner were obtained and evaluated. Across the entire sample contained within this study, 64.06% of mock-jurors (*n* =41) perceived that the individual they were taking to was 'British', as opposed to 'Asian' (17.19%), or 'other' ethnicity (18.75%). However, perception of gender was more evenly dispersed: 'male' (42.19%), 'female' (32.81%) and 'unsure' (25%) categories of choice.

5.8.9 Summary of results. The CMC modality found that more mock-jurors resisted persuasion compared to mock-jurors who were persuaded to change their verdict decision. Ethnic groups did not differ in persuasion outcomes, reflecting the overall sample distribution for persuasion. Furthermore, results show that males had a high degree of resistance (75%) whereas females had a much more even distribution regarding persuasion outcomes, albeit they too were marginally in favour of resistance at 59%. This disconnect between the genders was further highlighted when gender and ethnicity was broken down. Despite there being no significant differences in persuaded and non-persuaded outcomes across gender and ethnicity, figure 5.5 highlights that British females were 50:50 regarding their propensity to be persuaded but British males were at less than 20% for persuaded outcomes. South-Asian males and females on the other hand, had very similar distributions.

Taken at face value, confidence in verdict choices illustrate how those who were persuaded had lower confidence in their initial verdict choice (the inferential test almost reaching significance). At post-discussion, the non-persuaded mock-jurors increase their confidence further still, with there being a significant difference of over 20% between both persuaded and non-persuaded groups. However, when absolute confidence change was

179

calculated, the change in mock-jurors' confidence was found to be lower for non-persuaded mock-jurors, with persuaded participants having an average of 26% change in confidence rating despite changing their verdict, and this was generally in an upward direction.

Interestingly, the only significant finding regarding cognitive style came from comparisons across the ethnic groups, revealing a significant difference in delusional thinking scores. Here, South-Asian mock-jurors were higher in delusional thinking compared to the British sample. In addition, ethnic groups differed on duration of discussion, with South-Asian mock-jurors making their decisions faster, and speaking almost half the number of words compared to British mock-jurors. Ethnicity was not the only significant finding however, as non-persuaded individuals spoke for longer and used more words during the discussion when compared against successfully persuaded interactions.

Gender and cognitive style produced similarities relating to linguistic style, measured through the ten themes in LIWC. Ethnicity highlighted differences however, with South-Asian mock-jurors having a higher degree of affective language in their speech, which was more informal than the British sample. Furthermore, analysis on persuasion revealed greater use of cognitive processing and informal exchanges for persuaded individuals. These linguistic style results were not affected when word count was controlled.

Confidence in speech, measured using the epistemic modality dictionary in LIWC, revealed a small effect for persuasion: persuaded mock-jurors used more low confidence words in their verbal output compared to non-persuaded mock-jurors. Linguistic style matching (LSM) showed no differences in the synchronicity of speech across persuaded groups, nor did LSM differ over the duration of the jury discussion.

Qualitative analysis of mock-juror responses both before and after the jury discussion were taken and interpreted in line with the codebook covering the entirety of this thesis. Pre-questionnaire analysis revealed that non-persuaded individuals tended to use the prosecution and defence's arguments, whereas persuaded mock-jurors utilised the background information which lacked clear evidence or arguments which could reliably contribute towards an informed opinion. There were no differences regarding reasoning of verdict choice across the persuaded groups. Interestingly however, non-persuaded individuals were more likely to ignore evidence due to a perceived lack of credibility, indicating a systematic route to processing whereas persuaded individuals failed to acknowledge reference to the strength of evidence, rather choosing to ignore certain facts because they were 'irrelevant'.

Post-discussion, non-persuaded mock-jurors were twice as likely to rely on the fact that an individual is being charged and is at the centre of this investigation compared to mock-jurors who were persuaded to change their mind. This resistance to persuasion may be due to a focus being established as to the individual in question, which is further supported by the use of references in response to the questions. Individuals who do not have the propensity to reach a fast conclusion (low in cognitive style) were more open to alternate explanations, thus attributing responsibility to a number of different individuals. This is in comparison to those high in these measures, who were much more likely to attribute blame to the individual (managing director) in question. 1 in 5 mock-jurors who weren't persuaded stated they failed to change their mind because the evidence was not strong enough during the discussion. Furthermore, it seems that mock-jurors were split in their response to the CMC modality, describing it as both 'dynamic' and 'positive', but also 'slow' and 'tedious'.

Finally, given the anonymity of the environment, analysis was conducted as to mock-jurors attitudes towards their anonymous jury partners. Mock-jurors across ethnic,

gender and persuasion divides did not differ in their ratings of friendliness, aggressiveness and sociability of their confederate mock-juror. There was a propensity for all mock-jurors to state they were talking to another participant who was of British ethnicity, which is perhaps not so surprising given the research was carried out in Britain, with a British researcher.

5.9 Discussion

Persuasion can occur positively or negatively, that is a persuasive argument can have a positive effect on the receiver whereby they accept, process, and adopt the proposed attitude, belief, or decision. Alternatively, a persuasive message can have a negative effect in that the receiver deliberately, and as a direct consequence of the arguments, strengthens and increases an opposing attitude. This research has highlighted that computer-mediated communication (CMC) leads to enhanced resistance to persuasive messages when the environment is synchronous and anonymous. However, it is male persuasion that resulted in the significant yet negative result. In other words, males were significantly more likely to resist persuasion than change their verdict. Thus, these findings fail to support the first hypothesis made in this chapter.

Kimbrough, Guadagno, Muscanell, and Dill (2013) claim that women are more frequent users of social media, using text-based platforms to a higher extent that do males. Despite this, gender differences have continued within such synthetic mediums. For example, women tend to engage in communal activities inside synthetic environments, despite having the ability to behave and chose as they wish. Seemingly, men and women behave in a way that is consistent with social and gender expectations despite having free choice to act as they choose. This suggests that resistance seen within males demonstrates a level of dominance and competition compared to females, who still wish to form a bond or relationship with their anonymous communication partner and are thus less likely to

challenge and resist persuasive attempts in comparison (Fox, Bukatko, Hallahan, & Crawford, 2016; Guadagno & Cialdini, 2002; 2007). Future research should seek to investigate whether non-anonymous interactions in this modality would lead to similar effects.

Further evidence supporting the resistance to persuasive messages in this medium comes from confidence in verdict choices. Here, non-persuaded mock-jurors had higher confidence in their verdicts pre-, and post-discussion compared to persuaded mock-jurors. It is this certainty in opinion which has been found to increase resistance and act as a crystallising agent: improving permanence and impact (better known as the crystallisation hypothesis; Clarkson, Tormala, & Rucker, 2008). Research has linked this hypothesis with varying attitudes such as greater resistance to persuasion (Babad, Ariav, Rosen, & Salomon, 1987; Tormala & Petty, 2002) and a reduced need to process information (Maheswaran & Chaiken, 1991). These findings support the work of Tormala, Clarkson, and Petty (2006) who manipulated attitude certainty and found that as certainty increased, attitudes became increasingly predictive of behavioural intentions and consequently, resistant to subsequent attack.

In addition to persuaded mock-jurors having lower confidence in their verdict choice, persuaded mock-jurors also expressed lower confidence during the discussion, as measured using LIWC software. This increased expression of doubt and uncertainty follows from London et al.'s (1970a) findings whereby the persuadee expressed more doubt in their speech than persuaders. It highlights the doubt persuaded mock-jurors had in their initial verdict may have contributed to confederate mock-jurors having a slightly easier job at persuading such individuals to change their verdict during the online synchronous chat. Decisions made under uncertainty often result in a lack of confidence in these initial choices and inevitably lead to individuals seeking advice from other sources; in this case, the confederate mock-juror. The greater one's uncertainty, the greater the

increase in susceptibility to the confidence heuristic (Wesson, 2005), and this is supported by the current findings regarding low confidence in speech and persuaded outcomes.

An interesting finding emerged for ethnic groups, whereby South-Asian mock-jurors scored higher on the delusional thinking scale (PDI-R; Peters et al., 2004) than British participants. A high score on this measure indicates a propensity to reach a conclusion fast and jump to conclusions (Freeman et al., 2008). Furthermore, a jumping to conclusions bias is associated with the premature termination of data collection as individuals display a hyper-salience of hypothesis-evidence matching (Speechley, Whitman, & Woodward, 2010). This data-gathering bias emphasises how individuals high in delusional thinking seek less information and have an impulsive tendency to terminate evidence collection (Garety & Freeman, 1999). This is further supported by the current findings showing South-Asian mock-jurors having, on average, a shorter duration of discussion than the British mock-jurors, as well as speaking for half the time. This difference in the ethnic groups however does not directly influence persuasive outcomes, supporting hypothesis two and providing credence to previous research finding no interaction effects for culture and communication medium (Reinig & Mejias, 2004; Stewart, Setlock, & Fussell, 2007).

To the extent that the preponderance of arguments is both novel and persuasive, a change in attitude in relation to the dominant position will occur. This is known as the persuasive arguments theory (PAT; Burnstein, 1982; Vinokur & Burnstein, 1974) and has been found to occur both when arguments are manipulated (Silverthorne, 1971) and when they freely occur (Ebbesen & Bowers, 1974). This theory is partially supported by the qualitative comments provided by mock-jurors post-discussion comments, showing that over half of the persuaded mock-jurors changed their verdict due to the confederate mock-juror challenging their initial viewpoint and/or highlighting evidence that they themselves had initially missed. Exposure to arguments that have not been considered can influence

184

the persuasive impact these arguments will have on decision outcomes. Informational influence (acceptance of another's evidence about reality; Deutsch & Gerard, 1955) is thought to be at its peak when it is emphasised that an answer, the 'correct' answer, is needed and when the discussion itself enables elaboration of novel and credible arguments (McGuire, Kiesler, & Siegel, 1987). Thus, the extent that the CMC enables arguments to be aired that are deemed both credible and novel contribute to a shift in opinion, with dual-process models of persuasion indicating this process takes the systematic route whereby individual's weigh up the quality of the arguments presented rather than relying on biases that can contribute to a heuristic route to processing information (Di Blasio & Milani, 2008; Guadagno & Cialdini, 2007).

CMC is considered a lean form of communication; the current online environment is socially constrained and has the inability to exchange verbal, social and paralinguistic cues. The context enabled mock-jurors to be anonymous when communicating, perhaps meaning that a change in verdict was down to the persuasiveness of the arguments presented (Chaiken & Eagly, 1983). With motivation and interest in the subject being equal, it is argued that the absence of such distractors as social stimuli and non-verbal intonation means that individuals employ careful and logical reasoning and are thus more likely to take the central and systematic route to processing information (DiBlasio & Milani, 2008). This can in turn lead to reduced persuasion if the arguments lack validation or do not stand up to scrutiny. For example, information shared online in an anonymous way has been shown to lose credibility (Dennis, 1996) and have less influence on the shifting of opinions not only when the participant themselves are anonymous (McLeod, 2000) but also when their communication partners are anonymous (Haines, Hough, Cao, & Haines 2014; Sassenberg & Postmes, 2002).

The LIWC analysis revealed that the persuaded group had a larger frequency of cognitive processing and informal language when compared directly to the non-persuaded

groups. The impact is difficult to interpret within the bounds of the current research but it suggests that the persuaded group were involved in more effortful processing of the persuasive message. Socially, the increase in informality for persuaded interactions suggests that the social interaction flowed better and could be considered as more easy going. This is evidenced in previous research, which has reported that obscenity in speech significantly increases the impact of the persuasive message as well as the intensity of the speaker (Scherer & Sagarin, 2006), which has also been found to carry over into the online space (Cavazza, & Guidetti, 2014; Jay & Janschewitz, 2008).

The research reported in this chapter serves to expand on the use of CMC for understanding persuasion (previous research having primarily focused on asynchronous and artificial CMC environments) by utilising a real-time communication context akin to current social media platforms. This research supports the notion that CMC is a lean media context despite modern advances in synchronicity and emoticons - impeding persuasive appeals. Given the increasing ways in which individuals can now interact online, it is appropriate to expand the context still further. Accordingly, Study 3 investigates persuasion in VR, with mock-jurors interacting in a space suspended in reality (neither anonymous nor identifiable, but rather communicating through the use of a customisable avatar).

Chapter Six: The Virtual Reality Modality (Study 3)

6.1 Introduction

Virtual reality environments (VREs) are increasing in popularity and offer novel contexts within which to investigate human cognition. Research using immersive technology is being conducted in increasingly diverse fields, resulting in positive results for efficiency and accuracy of performances in the real-world (Dando & Tranter, 2016; Suh & Prophet, 2018). This can range from individuals experiencing high-pressure situations in a realistic yet risk-free way (Wilson, 2008), modelling threats in order to improve real-world resilience (Rizzo, et al., 2011; Wang, Tsai, & Chien, 2012), coaching individuals in cognitive coping strategies (Difede et al., 2007; Rizzo et al., 2013a; Rizzo et al., 2013b; Rizzo, Hartholt, Grimani, Leeds, & Liewer, 2014), training techniques for job-related sills such as investigative training and surgery techniques (Kuykendall, 2010; Teteris, Fraser, Wright, & McLaughlin, 2012), and recreation of virtual crime scenes for use in courtroom testimony (Bailenson et al., 2006).

Dando and Tranter (2015) have argued that the advancement of such technology offers opportunities for psychological researchers to understand a broad range of social cognitive behaviours outside of the traditional FtF contexts. Recently, Taylor and Dando (2018) began to investigate the role of social cognition using immersive technology for information-gathering purposes. They demonstrated how an interactive and immersive VRE can serve to increase eyewitness memory and reduce retrieval errors when communicating using avatar-to-avatar communication.

Gender has begun to be investigated regarding its influences on attitude change using VR. Guadagno, Blascovich, Bailenson, and McCall (2007) found evidence of gender in-group favouritism when individuals interacted using avatars. This effect was greater for women, who displayed enhanced opinion change as a result of interacting with

187

the same gendered avatar. This provides a good example of how gender differences diverge across multiple digital modalities. Nevertheless, research into gender differences in DMs, especially VR is extremely limited, and so little is understood about gender interactions and behaviours in synthetic environments. Nevertheless, Second Life platforms have recorded gender traditional behaviours where females appear to engage in more communal activities than males (Guadagno, Muscanell, Okdie, Burk, & Ward, 2011). Furthermore, Palomares and Lee (2010) found women were more apologetic and tentative when communicating through a female avatar compared to gender mismatched avatars, which were reported to lead to counter-typical language.

Jensen, Farnham, Drucker, and Kollock (1999) found that having the ability to hear someone's voice increased levels of cooperation. They posited this was due to participant's perception of social proximity. Additionally, Zanbaka, Goolkasian, and Hodges (2006) revealed that virtual characters with human voices were just as effective at changing attitudes as real people. Furthermore, they found gender interactions occurred in a similar pattern to a real-world study. In order to expand on the current studies and facilitate an increased sense of presence within the VRE, a headset is used in the current VRE enabling direct conversations to take place in real-time, whilst keeping participants physically anonymous, interacting through customisable avatars. As a result of implementing voice-enabled communication, it is hypothesised that persuasion will occur more often in females due to an increased level of media richness and social proximity (compared to Study 2 for example). In other words, it is thought that this modality will enable females to utilise paralinguistic cues and develop communal bonds with their jury partner in real time, thus leading to increased persuadability inside of the VRE compared to males.

A significant requirement when using VREs to study phenomena attributable to the real world is the ability for participants to experience immersion and a sense of presence

188

within the synthetic modality. Presence, in this context, referring to the psychological sense of being somewhere other than your physical body (Draper, Kaber, & Usher 1998). Four factors are thought to underlie the concept of presence. These include control, sensory, distraction and realism and together, these capture a person's feeling of *existing* within a VRE (Witmer, Jerome, & Singer, 2005). Presence needs to be substantial in order to elicit realistic responses and behaviour in the subjects of interest. As a result, a measure of presence (PQ; Witmer & Singer, 1988) is administered in the current study to accurately capture participant's sense of presence and realism, thus adding credence to any results captured. It has been postulated that higher degrees of presence effects depth of processing, enabling individuals to process information affectively, implicitly and heuristically (Grigorovici, 2003). If this holds, then arguments offered in a highly present environment could facilitate processing via the peripheral and heuristic route (Chaiken, Liberman, & Eagly, 1989; Petty & Cacioppo, 1986b).

Lee (2014) commented that there is a significant underrepresentation of non-white avatars online. This could in part be due to the research favouring Caucasian participant samples and/or a lack of technological ability to truly represent racial minorities. The current research therefore supports participant's ability to customise their avatar, which in turn enhances the richness and presence of the environment which could potentially contribute to the decision-making process. In this thesis, a strict focus is placed on immersive and collaborative VR, whereby the VRE is centred through the eyes of an avatar. Thus, corresponding movements in reality results in the appropriate changes to fields of vision to reflect the direction of gaze. This allows for a realistic VR experience. Given that the purpose of the paradigm is to persuade the participant, and high degrees of presence is assumed to increase human performance (Bombari, Schmid Mast, Canadas, & Bachmann, 2015), it reasonable to expect that a VRE with a high degree of presence will lead to more mock-jurors being persuaded than not.

In summary, two predictions are made for this experimental study which emerge from the existing research literature:

1) Females will have increased persuadability compared to males;

2) The immersive and collaborative VRE will result in high levels of presence and persuasion outcomes. As a result, more participants will be persuaded than not.

6.2 Method

6.2.1 Participants. Sixty-seven participants took part in the current study: 17 British males, 16 British females, 17 South-Asian males, and 17 South-Asian females. Of the British sample, 84.85% ($N = 28$) classified their ethnicity as English, 1 (3.03%) as Irish, 1 as Welsh (3.03%), and 3 declined to comment (9.09%) but stated their parents were born and raised in Britain. 64.70% of the South-Asian sample stated their ethnicity as Pakistani ($N = 22$), 11.76% (4) as Bangladeshi, 11.75% (4) as Indian, 2.94% (1) as Afghani, and 8.82% (3) declined to comment but stated their parents were born and raised in South-Asia. Ages ranged from 18 to 43, with a mean age of 22.53 years ($SD = 5.22$).

This study consisted of 8 confederate mock-jurors (4 British females, 2 British males, 1 South-Asian male, and 1 South-Asian female), with a mean age of 21.25 ($SD = 2.12$). Participants and confederates were recruited using opportunity and snowball sampling in the West Midland and London areas, and attended the University of Wolverhampton or the University of Westminster for the research. Participants were given the choice between receiving course credits (if they were studying psychology) or being

190

paid £10.00 for their time. The confederate mock-jurors were paid £5 per mock juror for participating in the research.

6.2.2 Materials and procedure. Now follows information on the materials and procedures that differ to the procedures outlined in Study 1. As in the previous two studies, this study uses the same JM paradigm.

6.2.2.1 *The visual headset.* The head-mounted display (HMD) was an Oculus Rift Development Kit 2 (DK2) headset. It had a resolution of 960 x 1080 per eye and a refresh rate of up to 60 Hz. In addition, it had a low persistence OLED display, comprising a 100º field of view which increased presence and eliminated motion blur and judder; two of the biggest contributors to simulator motion sickness (Shafer, Carbonara, & Korpi, 2017). Precise, low-latency positional tracking used near infrared CMOS sensor to track real-world head movements and facilitated a full 360 º viewing direction if required. Adjustable eye pieces meant that individuals wearing prescription glasses were additionally able to wear the HMD without discomfort or a reduction in visual quality (See Figure 6.1).

Figure 6.1. Oculus Rift DK2 Headset (right) and DK2 positional tracker.

6.2.2.2 *The audio headset.* A Cooler Master Ceres-300 gaming headset was used. The detachable omni-directional microphone captured real-time sound as individuals conversed, whilst 40mm drivers were utilised to transmit noise-cancelling immersive audio between the participants and researchers. An in-line remote allowed adjustment of volume for audio customisation. Previous uses of multi- modal VR systems which include realistic sound have been shown to result in higher presence (Taffou, Chapoulie, Guerchouche, Drettakis, & Viaud-Delmon, 2012).

6.2.2.3 *The virtual reality environment (VRE).* Once participants had read the case summary and completed the pre-questionnaire they were fitted with the HMD; the researcher adjusting the fitting of the headset and calibrating the participant's vision. The bespoke virtual environment was designed and customised specifically for this research using Unreal Engine 4 software, displayed on Intel Core i7-4720HQ, 2.60GHz CPU Windows 8.1, 64-bit NVIDIA GeForce GTX 980M Graphics Card, 16.0 GB of RAM 250 GB SSD laptops (three in total: one each for the participant, confederate and researcher).

Once wearing the HMD, participants were asked to customise their avatar. This included choices of gender, hair, shirt and skin colour. The HMD enabled participants to move their head to see and control the mouse cursor, whilst the keyboard facilitated the

192
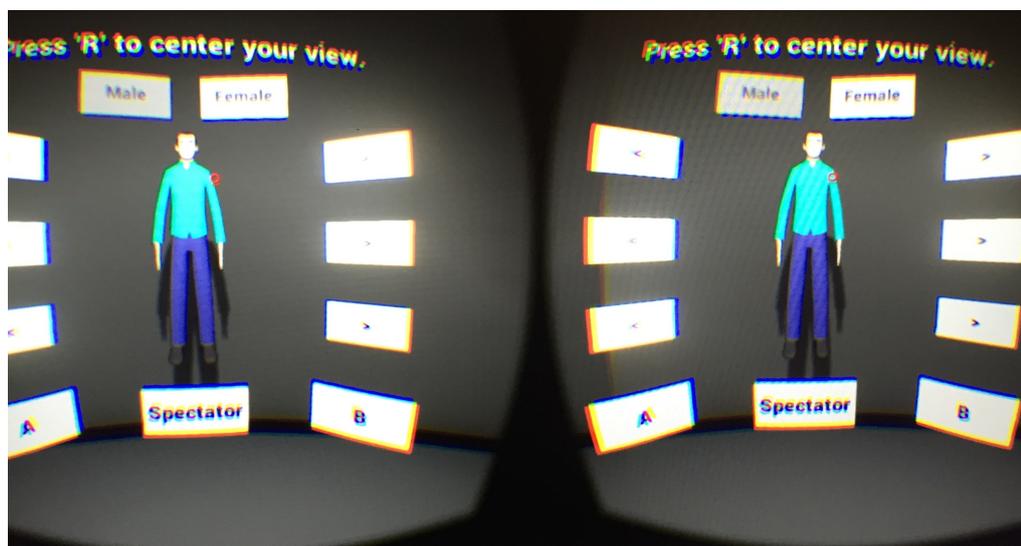
Figure 6.2. Participant's view of the avatar customization selection panel.

selection of their choices (see figure 6.2). Once a selection had been made, the participant then entered into the VRE. The immersive and collaborative VRE comprises of a single room, in which a table and two chairs featured in the centre, resembling the layout taken in

The avatars were positioned on the chairs, facing opposite each other around the table. This is a stationary position, so participants could not move from the table. The field of vision is created through the eyes of their custom avatar, allowing participants to see their own body if they look down to their lap but not their current facial features. Both the participant and the confederate can only see each other using the HMD, whilst the VRE enables the researcher to view the entire environment (Figure 6.3) on a separate 'control' computer. The confederate and the participant did not meet each other physically until after the research had been completed.
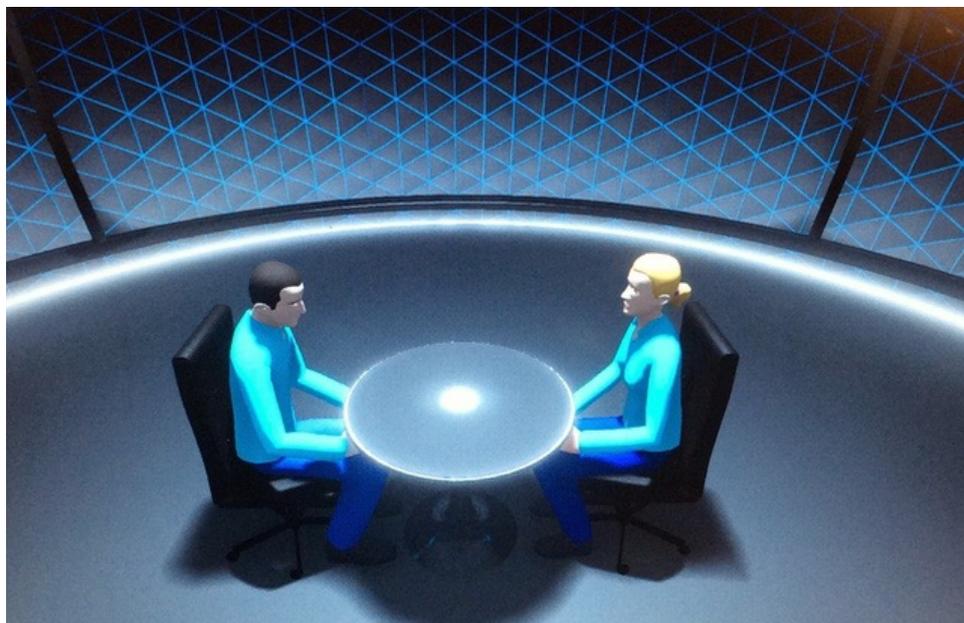
Figure 6.3. Screenshot of the VRE, from the Researcher's perspective.

Once both the participant and confederate were inside the VRE (see figure 6.4), the researcher explained how the discussion (see researcher instruction script in Appendix D) would work, through the audio headset. All discussions were audio and video recorded from the researcher's 'control' computer.

Figure 6.4. Confederate (left) and Participant (right) inside the VRE, discussing the JM paradigm.

6.2.2.4 *The presence questionnaire (PQ).* A multifaceted measure of presence was administered to enable the researcher to quantity the extent to which participants felt immersed within the VRE and how likely they were to 'forget' real-world stimuli. The Presence Questionnaire (PQ) created by Witmer and Singer (1988) consists of 32 self-report items, asking participants to comment on their perceptions, involvement and interactions with the VRE, as well as how quickly they adjusted to the VR experience. The scale includes four sub-factors: involvement, adaption/immersion, sensory fidelity and interface quality (Witmer, Jerome & Singer, 2005) and has been shown to be highly internally consistent with high reliability scores (Witmer & Singer, 1988).

The VRE within this study did not permit individuals to touch, manipulate or interact with objects within the environment, nor did it require the use of any control devices. Therefore, an adapted measure of the PQ scale was used, excluding unrelated

questions and resulting in a total of 25 self-report items. These were measured on a Likert scale ranging from 1-7, with a total presence score (after adjusting for the reverse score items) resulting in a possible range between 25-175. The scale is provided in Appendix O.

6.2.2.5 *Simulator sickness.* VREs can cause symptoms of motion sickness if inconsistent body orientation clashes with the motion received from the HMD (*see cue conflict theory*; Kolasinski, 1995). This is minimised in the current study due to participants sitting down both physically and virtually for the entirety of the research study. Nevertheless, to ensure that the current VRE environment did not cause any adverse side-effects for participants, a simulator sickness questionnaire was administered prior to, and after the VRE to monitor for symptoms such as nausea, headaches, dizziness and severe disorientation which have the potential to impact on social cognition.

6.2.2.5.1 *The pre-simulator sickness questionnaire (pre-SSQ).* Individual differences are known to influence the severity of sickness felt inside a simulation. For example, individuals with a history of motion sickness, current illnesses such as the flu, fatigue, and alcohol consumption (being hungover) have all been found to increase the risk of sickness (Stanney & Kennedy, 2009; Stanney, Kingdon, Graeber, & Kennedy, 2002). Therefore, to measure a participant risk and enable a baseline analysis of the simulator sickness to take place, a pre-SSQ measure was utilised prior to exposure of the VRE. This measure was first administered by Reed-Jones (2011; see Appendix P).

Just over 31% of mock-jurors stated that they had a history of motion sickness. 5.7% of the mock-jurors self-reported they were currently hungover, whilst 9.4% stated they were feeling unwell at the start of the research. Individuals who indicated that they felt unwell or had a history of motion sickness were advised they may face an increased risk of simulator sickness and were given the choice to stop the study without penalty (no participants chose to do this). These questions allowed for analysis of scores obtained from

the SSQ to be representative of the VRE immersion, rather than any propensity to simulator sickness.

6.2.2.5.2 *The simulator sickness questionnaire (SSQ).* The SSQ (Kennedy, Lane, Berhaum & Lilienthal, 1993) is considered '*the gold standard for measuring simulator sickness'* (Johnson, 2005, p. 29) and comprises 16 self-report questions, using a Likert scale from 0 (*none*) to 3 (*severe*; see Appendix Q1). The scale provides scores for the total severity of sickness (Ts), as well as the three subscales that make up the Ts; consisting of nausea (N), oculomotor discomfort (O) and disorientation (D). Table 6.1 contains the scoring procedure for the SSQ, whilst Appendix Q2 outlines an example of the SSQ worksheet. Here, all scores have a low range score of zero highlighting no reported symptoms. Across the total and subscale scores, a higher value represents a higher level of simulator sickness symptoms experienced by the participant.

Table 6.1

SSQ Scoring Procedure

Symptoms	Nausea (N)	Oculomotor (O)	Disorientation (D)
General discomfort	1	1	
Fatigue		1	
Headache		1	
Eye strain		1	
Difficulty focussing		1	1
Increased salivation	1		
Sweating	1		
Nausea	1		1
Difficulty concentrating	1	1	
Fullness of head			1
Blurred vision		1	1
Dizzy (eyes open)			1

Dizzy (eyes closed)			1
Vertigo			1
Stomach awareness	1		
Burping	1		
Total severity (Ts)	**[1]**	**[2]**	**[3]**

Weights: N = 9.54, O = 7.58, D = 13.92, Ts = 3.74

N = [1] * 9.54
O = [2] * 7.58
D = [3] * 13.92
Ts = ([1] + [2] + [3]) * 3.74

6.2.2.6 *Demographic questionnaire.* In addition to the demographic questions outlined in Chapter 3 and administered to previous participants in Studies 1 and 2, further questions were asked in Study 3. Some items were designed to screen participants' in terms of their capacity to use the VR technology (problems with vision or hearing). If any issues arose which were not able to be corrected (eg, wearing glasses), they were given the opportunity to try the VRE and stop their participation if they felt they could not interact comfortably (either visually or aurally). Only 1 person stated they had issues with their eyes which hadn't been corrected but this did not cause issue with their interaction with the VR equipment, and they voluntarily completed the study.

Additional data capture questions included the types of video games played and how often participants spend gaming/using a computer per week. This allowed the researcher to gauge the ease and experience at which participants used such technology (See Appendix R).

6.3 Results

197
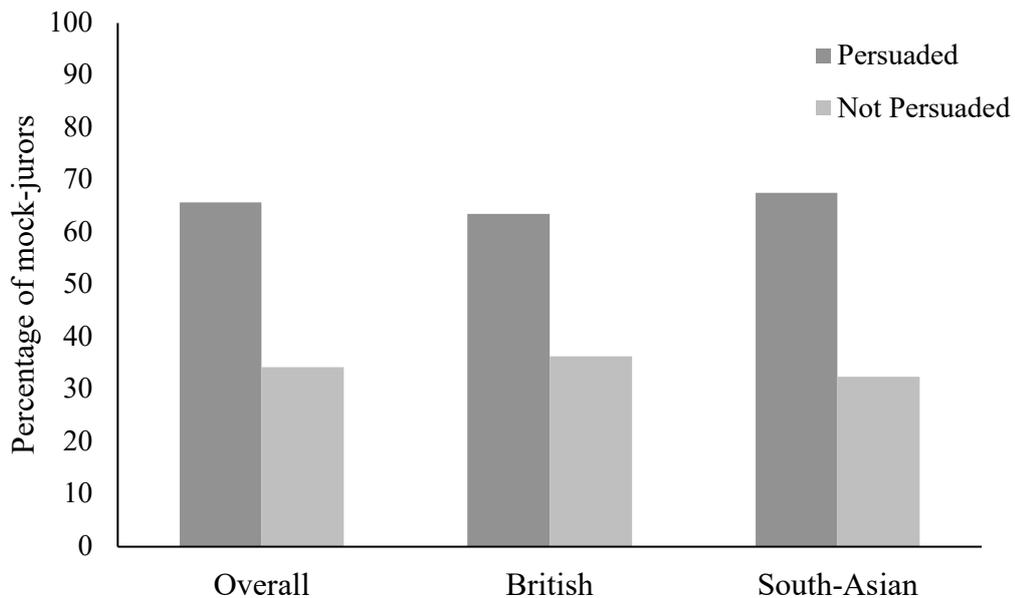
6.3.1 Mock-juror persuasion. Nearly double the amount of mock-jurors changed their verdict ($n = 44$; 66%) compared to those who resisted persuasion ($n = 23$, 34%).

6.3.1.1 *Ethnicity and persuasion*. To understand further if ethnicity affected the persuasion outcome reported above, a test for independence chi-square was conducted. This revealed a non-significant effect, $x^2(1) = .12, p = .730$. Descriptive analyses show a higher frequency of South-Asian mock-jurors being persuaded ($n = 23$) than not persuaded *($n = 11$)*, and this distribution mirrors the British mock-jurors ($n = 21$ v. 12; see Figure 6.5).

Figure 6.5 showing Persuasion broken down into Ethnic groups, compare to the overall VR sample ($n = 67$).

6.3.1.2 *Gender and persuasion*. A chi-square test for independence revealed an overall non-significant result of gender, $x^2(1) = .47, p = .494$. Females ($n = 23$) and males ($n = 21$) were more persuaded than not (female $n = 10$; male $n = 13$) but the distribution across the genders remained constant (see Figure 6.6).

198
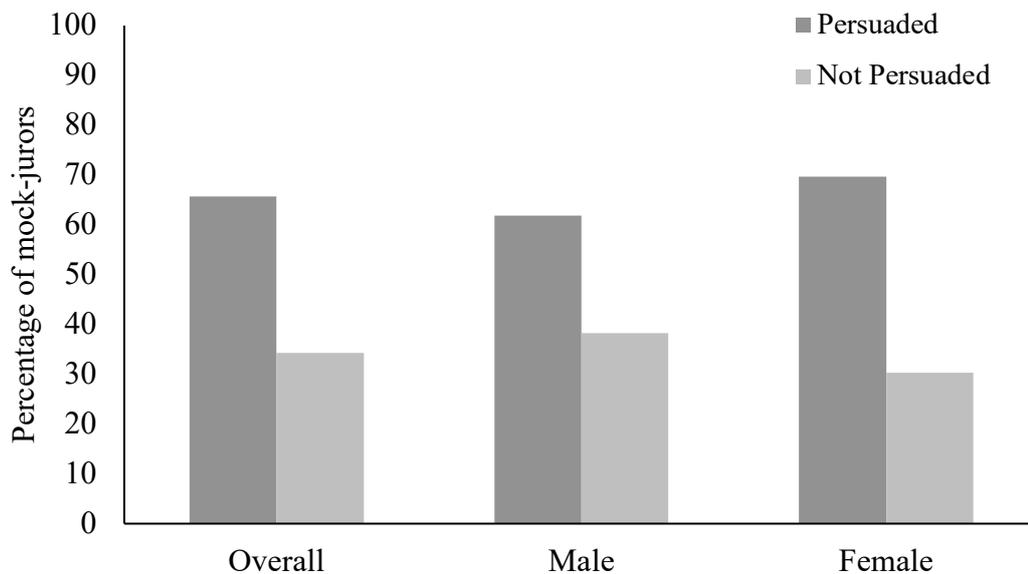
Figure 6.6.   Percentage of persuasion broken down by gender groups, compared to the overall sample ($n = 67$).

6.3.1.3 *Ethnicity, gender and persuasion.* Two chi-square tests for independence were conducted on persuaded and not-persuaded samples to investigate gender and ethnicity. These revealed non-significant effects for both persuaded, $x^2(1) = .38, p = .537$, and non-persuaded groups, $x^2(1) = 1.05, p = .305$ (see Figure 6.7).
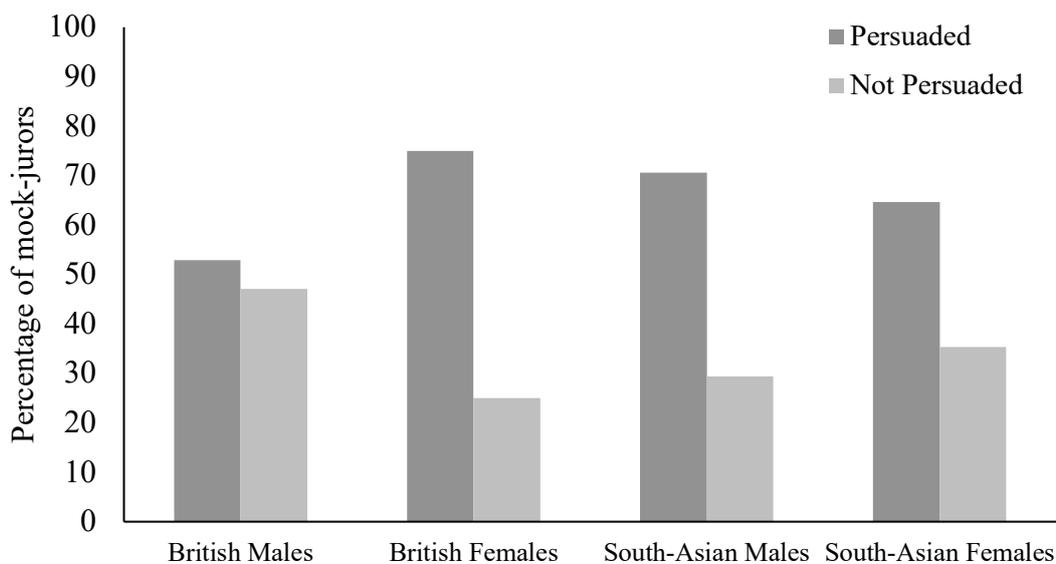
Figure 6.7.   Persuasion as a function of Ethnicity and Gender.

6.3.2 Confidence in verdict choice. A comparison of pre- and post-confidence of verdict choice was investigated using a series of between-factor ANOVAs for ethnicity, persuasion and gender across the two time points (see Table 6.2). The ANOVAs show that none of the groups significantly differed in their confidence levels either before, or after the jury discussion (all p's > .05).

Table 6.2

Descriptive and inferential statistics for pre- and post-confidence in verdict across three variables

Factor	Levels	Pre-Discussion (%)				Post-Discussion (%)			
		M	*SD*	*F*	*p*	*M*	*SD*	*F*	*p*
Persuasion	Persuaded	67.67	15.75			70.57	22.83		
				.81	.371			3.08	.084
	Not-Persuaded	71.74	20.37			80.87	22.8		
Gender	Male	70.58	18.94			70.58	22.59		
				.51	.477			1.60	.21
	Female	67.50	15.86			77.73	23.55		
Ethnicity	British	68.28	16.83			73.94	24.10		
				.13	.718			<.01	.955
	South-Asian	69.85	18.24			74.26	22.60		

Note. M = mean; *SD* = standard deviation; *F* = univariate ANOVA; *p* = significance value.

6.3.2.1 *Percentage change in confidence of verdict choice.* Once the percentage change scores for confidence were converted (as outlined previously in Chapter 3), ANOVAs revealed non-significant Gender, F (1, 63) = .95, p = .334, Ethnic, F (1, 63) = .23, p = .587, PDI-R high or low, F (1, 30) = .16, p = .688, and NfCC high or low, F (1, 30) = .53, p = .472 effects. Persuasion produced a significant result for Levene's statistic (p > .05) and so the Welch's F was utilised. This revealed a significant difference in percentage change scores, *Welch's F* (1, 61.26) = 39.19, p < .001, η_p^2 = .57, 95% CI [26.17, 38.29]. Mock-jurors who were persuaded had an average mean change score of 42.50% (SD = 22.69, 95% CI [35.43, 49.57]) whereas those who were not persuaded had an average change score of 13.48% (SD = 3.04, 95% CI [7.18, 19.78]).

Further analysis was conducted to investigate whether this difference in confidence change between the persuaded groups was positive or negative in direction (thus whether individuals increased or decreased in confidence overall). Due to low expected cell frequencies (< 5), and contingency table being larger than 2x2, a Fisher-Freeman-Halton test was performed. This resulted in a significant association for persuasion and direction of absolute confidence change, x^2 (2) = 20.73, p < .001, $\varphi.$ = .56.

To understand at which level the significant association exists, the data was further broken down, and standardised residuals were calculated and analysed (see Table 6.3). These revealed significant effects for absolute confidence in verdict choice on persuasion; that is, those individuals who were persuaded were significantly less likely to have no change in confidence, whereas those not persuaded were significantly more likely to have no change. There was no significant effect in decreased or increased confidence for persuasion (see Table 6.3).

Table 6.3

A 3x2 contingency table containing frequency data (n) and standardised residuals (z) for persuasion and direction of confidence

		Direction of absolute confidence in verdict choice		
		Increased	Decreased	No Change
Persuaded	*N*	37	4	1
	z	1.2	0.1	-2.4*
Not Persuaded	*N*	10	2	11
	z	-1.6	0.1	3.3**

Note. *p < .05, **p < .001

6.3.3 Mock-juror cognitive style. Cognitive style consists of delusional thinking (PDI-R) and the need for cognitive closure (NfCC) (see Table 6.4). All inferential results revealed non-significant effects across persuasion and gender ($p > .05$), except for delusional thinking and ethnicity. Here, South-Asian mock-jurors scored significantly higher on delusional thinking than British mock-jurors. Spearman's rho correlational analysis was conducted on the total scores for each cognitive scale and revealed a non-significant relationship between the two measures, $r = .22$, $p = .08$.

Table 6.4

Summary descriptives and ANOVA analyses of the total PDI-R and NfCC scores as a function of Gender, Ethnicity and Persuasion

Factor	Level	NfCC				PDI-R			
		M	*SD*	*F*	*p*	*M*	*SD*	*F*	*p*
Gender	Male	149.29	16.79			50.09	34.29		
				2.00	.16			1.56	.22
	Female	155.03	16.42			62.70	47.47		

		M	SD	F	p	M	SD	F	p
Ethnicity	British	149.70	16.30			38.39	31.60		
	South-Asian	154.47	17.05	1.37	.25	73.68	42.92	14.61	<.001
Persuasion	Persuaded	153.09	17.24			54.84	42.79		
	Not Persuaded	150.26	15.92	.43	.51	59.09	59.09	.16	.69

6.3.3.1 High or low on cognitive style. The distribution of PDI-R scores for mock-jurors ranged from 0-219, with an overall mean across the entire sample of 56.30 (SD = 41.48). Seventeen mock-jurors from the overall sample were classified as low in their delusional thinking, falling within the lowest quartile of total PDI-R scores (= or < 23; M = 15.00, SD = 5.77). Sixteen mock-jurors were categorised as high in delusional thinking scoring equal to, or more than 81 on the PDI-R scale (M = 113.19, SD = 38.26).

NfCC total scores ranged from 117-195, with a mean average of 152.12 (SD = 16.73). Sixteen mock-jurors fell within the top quartile of scores (= or > 163) and were classified as high on their NfCC (M = 173.94, SD = 8.22, while 18 fell in the lowest quartile and were thus considered as low in their NfCC (= or < 142; M = 131.67; SD = 7.54).

Univariate ANOVAs were conducted on the categories described; the aim being to investigate the differences between mock-jurors scoring high or low on cognitive style across duration and pre- and post-confidence in verdict choices. Chi-square analyses were also conducted on high or low cognitive style, and persuasion. The results of these statistical analyses can be seen in Table 6.5 - The key finding being that mock-jurors who scored high on PDI-R also had a higher pre-discussion confidence in their verdict

compared to those who scored low in delusional thinking, who had significantly lower confidence in their initial verdict choice.

Table 6.5

Descriptive and inferential statistics for mock-jurors scoring high or low in cognitive style, for Duration of discussion, Pre- and Post-confidence in verdicts, and Persuasion

Note P = persuaded, NP = not-persuaded.

Source		Group Comparison		Statistic	*p*	Effect
		High	Low			Size
PDI-R						
	Duration	$M = 645.25$	$M = 423.29$	$F = 2.33$	.137	$\eta_p^2 = .26$
		$SD = 568.36$	$SD = 186.53$			
	Pre-	$M = 76.56$	$M = 61.76$	$F = 5.90$	.021	$\eta_p^2 = .40$
	Confidence	$SD = 21.35$	$SD = 12.86$			
	Post-	$M = 73.44$	$M = 73.53$	$F < .01$	.992	$\eta_p^2 < .001$
	Confidence	$SD = 26.56$	$SD = 24.16$			
	Persuasion	n P = 8	N P = 11	$\chi^2 = .73$	.491	$\varphi = .15$
		n NP = 8	N NP = 6			
NfCC						
	Duration	$M = 411.44$	$M = 533.72$	$F = 1.05$	.312	$\eta_p^2 = .18$
		$SD = 378.98$	$SD = 315.09$			
	Pre-	$M = 75.67$	$M = 68.06$	$F = 1.81$	.188	$\eta_p^2 = .23$
	Confidence	$SD = 15.45$	$SD = 16.73$			
	Post-	$M = 73.75$	$M = 80.56$	$F = 1.16$	.289	$\eta_p^2 = .19$
	Confidence	$SD = 22.55$	$SD = 13.71$			
	Persuasion	n P = 12	N P = 11	$\chi^2 = .75$	.477	$\varphi = .15$
		n NP = 4	N NP = 7			

6.3.4 Duration of jury discussion. The average length of the jury discussions was 501.45 seconds ($SD = 379.02$). A univariate ANOVA revealed a significant difference, *F*

(1, 65) = 8.07, p = .006, η_p^2 = .33, 95% CI [409.00, 593.90] whereby mock-jurors who

were not persuaded had a longer jury discussion (M = 674.35, SD = 420.56, 95% CI

[492.48, 856.21]) than those who were persuaded, (M = 411.07, SD = 325.05, 95% CI

[312.24, 509.89]). No significant effects were found for Ethnicity, F (1, 65) = .01, p = .925,

Gender, F (1, 65) = 1.82, p = .182, or cognitive style: PDI-R F (1, 31) = 2.00, p = .168, ,

and NfCC F (1, 32) = 1.41, p = .244, as a function of duration.

6.3.5   Mock-juror linguistic analysis.

6.3.5.1   *Word count (WC)*. To investigate whether the amount of words spoken

during the jury discussion differed across the variables of interest, univariate ANOVAs

were analysed. Ethnicity, F (1, 65) = .62, p = .433, Gender, F (1, 65) = 3.57, p = .063, and

Cognitive Style NfCC F (1, 32) = .94, p = .340, and PDI-R F (1, 31) = 2.25, p = .143, all

produced non-significant results. However, WC for persuasion was significant, *Welch's F*

(1, 34.76) = 10.47, p = .003, η_p^2 = .40, 95% CI [577.01, 885.01]. Non-persuaded mock-

jurors spoke almost double the amount of words throughout the discussion (M = 1081.09,

SD = 697.73, 95% CI [779.37, 1382.81]), than mock-jurors who were persuaded (M =

548.02, SD = 512.77, 95% CI [392.13, 703.92]). A linear regression revealed that

persuasion accounts for 15% of the variation in WC, Adj. R^2 = .15.

6.3.5.2   *LIWC categories*. To investigate language and its effect on ethnicity,

persuasion and gender, a series of between-factor MANOVAs were conducted on the 10

primary categories arising from the LIWC analysis. Non-significant multivariate effects

were found for gender, Wilks's Λ =.75, F (10, 56) = 1.86, p = .070, and persuasion,

Wilks's Λ = .76, F (10, 56) = 1.79, p = .083. However, ethnicity revealed a significant

multivariate effect for the primary LIWC categories, Wilks's Λ = .55, F (10, 56) = 4.55, p <.001, η_p^2 = .45. Follow-up between-factor ANOVAs (using Bonferroni's correction) and their descriptive statistics are represented in Table 6.6, showing that analytic thinking, tone and affective language significantly differed across the ethnic groups. In particular, the South-Asian participants had higher affect and tone in their speech compared to the British participants, who had higher uses of analytical linguistic categories.

Table 6.6

Descriptive statistics and univariate main effects of linguistic categories for ethnicity (n = 67)

Linguistic Category	Ethnicity		Inferential statistic	Significance value	Effect size
	British	South-Asian	F	p	η_p^2
Analytical Thinking	M = 11.75 SD = 6.23	M = 5.89 SD = 4.43	19.78	<.001	.23
Clout	M = 46.35 SD = 17.45	M = 46.67 SD = 19.69	<.01	.944	<.001
Authentic	M = 32.70 SD = 20.43	M = 35.76 SD = 25.42	.29	.589	<.01
Tone	M = 34.70 SD = 22.55	M = 54.13 SD = 26.27	10.52	.002	.14
Total Function words	M = 61.90 SD = 2.97	M = 61.61 SD = 4.12	.10	.749	<.01
Affective processes	M = 4.75 SD = 1.64	M = 6.25 SD = 2.37	9.07	.004	.12
Social processes	M = 10.62 SD = 11.91	M = 2.41 SD = 3.41	3.17	.080	.05
Cognitive Processes	M = 18.24 SD = 2.61	M = 20.13 SD = 3.06	7.40	.008	.10

Drives	M = 5.75 SD = 1.92	M = 5.92 SD = 1.89	.14	.711	<.01
Informal Language	M = 9.20 SD = 4.48	M = 9.00 SD = 3.83	.04	.846	<.01

Note. df = 1, 65.

6.3.5.3 *Confidence in linguistic style*. Linguistic confidence (epistemic modality) was analysed using LIWC analysis, thus outputs express high and low confidence as a percentage of the total words within each discussion. A 2 (Gender: male v female) x 2 (Ethnicity: south-asian v british) x 2 (Persuasion: persuaded v not persuaded) between-factor MANOVA was conducted on the two DVs being measured (high and low confidence in linguistic style). This revealed no significant multivariate main effects for Gender, Wilks's Λ = .96, F (2, 58) = 1.11, p = .336, Ethnicity, Wilks's Λ = .94, F (2, 58) = 1.90, p = .159, and Persuasion, Wilks's Λ = .92, F (2, 58) = 2.44, p = .096. Additionally, there were no significant interactions for Gender x Ethnicity, Wilks's Λ = .92, F (2, 58) = 2.41, p = .099, Gender x Persuasion, Wilks's Λ = .97, F (2, 58) = .86, p = .429, Ethnicity x Persuasion, Wilks's Λ = .92, F (2, 58) = 2.67, p = .08, and no significant trilateral interaction for Gender x Ethnicity x Persuasion, Wilks's Λ = .99, F (2, 58) = .26, p = .77.

To understand the interaction between the dyadic pairings and persuasion, a further 2 (Persuasion: persuaded v not persuaded) x 2 (Dyadic paring: mock-juror v confederate mock-juror) between-factor MANOVA was conducted on high and low epistemic modality. This revealed no significant differences in linguistic confidence for the Dyadic pairs, Wilks's Λ = 1.00, F (2, 129) = .05, p = .95, and no significant interaction between Persuasion and Dyadic pairing, Wilks's Λ = .97, F (2, 129) = 2.10, p = .126.

6.3.5.4 *Linguistic style matching (LSM).* To understand the differences between persuasion groups on linguistic synchronicity, an independent t-test was conducted on the mean total LSM scores. This produced a non-significant effect, $t(65) = -1.20$, $p = .236$, $d = .31$ indicating that the LSM scores did not differ for persuasion.

6.3.5.4.1 *LSM over time.* LSM was broken down into even quartiles for each individual jury discussion, which allows LSM to be calculated and compared, thus allowing a better understanding of the role synchronicity of language plays in persuasion. A 2 (Persuasion: persuaded v not persuaded) x 4 (Time: 1, 2, 3, 4) mixed-factor ANOVA revealed a non-significant main effect for Time, $F(3, 195) = .32$, $p = .811$. The main effect of persuasion was significant, $F(1, 65) = 5.26$, $p = .025$, $\eta_p^2 = .07$, whereby LSM significantly differed for persuaded outcomes. Here, the synchronicity of linguistic style was lower for persuaded participants than for non-persuaded participants (M persuaded = .738, 95% CI [.71, .76]; M not persuaded = .786, 95% CI [.75, .82]). The persuasion X time interaction was also significant, $F(3, 195) = 2.82$, $p = .040$, $\eta_p^2 = .04$, (see Figure 6.8). Post-hoc analyses revealed that LSM significantly differed for persuasion at times 1 and 4, only (p's = .004).
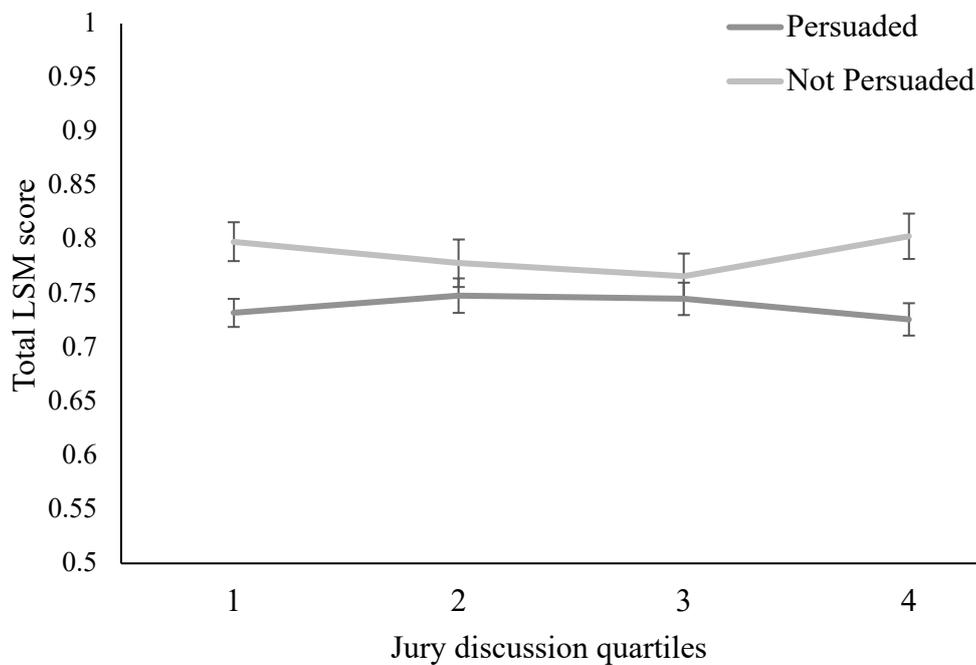
Figure 6.8. Mean LSM total score for mock-jurors discussion per quartile, as a function of persuasion. Error bars denote ± SE (standard error of the mean).

6.3.6. Mock-juror qualitative content analysis (QCA). Qualitative analysis of the mock-jurors' responses to the questionnaires, both before and after the jury discussion were collated and scored in accordance to the QCA codebook. Below is a summary of the key findings, with the full descriptives presented in Appendix table M3.

6.3.6.1 Descriptive group comparisons for the pre-questionnaire.

Theme 1: Facts used to inform decision-making. Most mock-jurors used the core arguments as a basis but expanded beyond the evidence provided, citing their own knowledge or experience in line with the given arguments (47.7%). 20.9% of mock-jurors focused solely on the core arguments. Together, this shows that the majority of participants were engaged with the material provided as well as the persuasive arguments contained in the counsel's speeches, rather than the contextual information.

Theme 2: References to the accused. Across all but one of the variables being investigated here (cognitive style, gender, ethnicity and persuasion), most mock-jurors referenced the company itself rather than the individual being prosecuted. The exception being 43.5% of the not-persuaded mock-jurors who reference both the company and the individual within their reasonings and evidence pre-jury discussion. It is interesting to note that those who were not-persuaded to change their verdict (whether guilty or not) engaged with scenario as a whole, taking into account both the company and the individual; thus, conceivably inoculating their arguments from the persuasive messages within the jury discussion.

Theme 3: Reasoning for verdict choice. QCA code 8 depicts reasoning for the chosen verdict surrounds a moral argument, referencing fairness and justice. Surprisingly, 13.6% of mock-jurors whom initially reasoned that their choice was based on a moral argument, later changed this reasoning post-discussion despite not changing their verdict. '*The managing director shouldn't take all the responsibility. The company may be guilty but the MD should not be arrested*' [FB16]; '*In essence, I wasn't comfortable putting the blame onto the company when even the most up to date defences couldn't prevent theft*' [MB16]. This is in direct comparison to the persuaded sample, where no-one fell into this category.

Nearly a fifth of the persuaded group (18.2%) explained their verdict choice was based on the case file evidence only: '*The defendant is not responsible for the negligence. This is because his company was hacked by sophisticated hackers*' [MA9]. Here, participants failed to expand on the arguments and/or used vague reasoning. For example, '*The factors I have stated are important because with my understanding of this scenario, I believe that Datastore Ltd were not responsible for the negligence due to the fact that hacking methods are very skillful and sophisticated*' [FA7]. Alternatively, 4.3% of the non-persuaded sample fell within this QCA sub-theme. It suggests that using surface-level

210

information leads to reduced-impact arguments and thus such individuals become more susceptive to a change of opinion when exposed to contrary persuasive statements.

Perhaps not so surprisingly, a higher percentage of not-persuaded mock-jurors used analytical reasoning to explain their decision (13% compared to 2.3% from the persuaded group). This indicates the use of systematic reasoning, utilising the central route of processing and thus resisting subsequent persuasive messages.

Three mock-jurors referred to a lack of evidence or certainty when explaining their initial verdict choice; all of which were British males. 11.1% of the participants who were low in the NfCC, and 11.8% of those low in delusional thinking indicated a lack of certainty and evidence when clarifying their verdicts choices. No mock-jurors high in cognitive style scored QCA code 12. Thus, British males, low on cognitive style referred to the lack of evidence, '*more investigation is needed*' [MB12], and found it hard to reach a conclusion with the evidence presented. For example, '*Did he stray from his usual practice, could more have been done by security company to protect the file? Hard to answer this info therefore could not unanimously commit the managing director. I would just be guessing that the managing director had done something*' [MB19].

Theme 4: Attribution of responsibility. Individuals low on NfCC tended to blame the company for the negligence depicted (61.1%). Whereas those high in the NfCC and wish to reach a conclusion fast tended to focus on the hackers, blaming them for the events depicted (42.8%, compared to 5.6% for low NfCC participants). It is much easier to blame the hackers in this scenario, as this was not the issue for debate; the controversial issue being whether the defendant and the company 'Datastore' were responsible. Thus, those high in the NfCC, who tend to jump to conclusions and wish to reach a decision early perhaps relied on the peripheral route of processing, choosing the 'easier and more obvious' option.

Theme 1: Facts ignored in the decision-making process. A high percentage of mock-jurors (34.3%) claimed they ignored the background information. This implies that participants focused on the arguments supporting their verdict choices, and ignored irrelevant information that is not considered 'evidence' (the background information depicted in paragraphs 1-4 of the case summary). There were no significant differences across variables for this QCA theme.

Theme 3: Reasoning for ignoring these facts. Following on from Theme 1 above, most mock-jurors either ignored the information they did as they perceived it to be irrelevant or failed to provide a reason. Females were more likely to use analytical reasoning when explaining why they had ignored such information (15.2% v. 5.9% males), and thus less likely to simply state it was irrelevant (9.1%); males scored higher in the 'irrelevant' sub-theme (35.3%), failing to expand their reasoning as to why this is the case. In other words, females described in more detail their reasoning, indicating further thought and assessing both sides of the argument when forming their verdict choices.

6.3.6.2 Descriptive group comparisons for the post-questionnaire.

Theme 1: Facts used to inform decision-making. Once they had discussed the case with the confederate mock-juror, very few participants continued to rely solely on the background information (4.5%). Instead the majority of mock-jurors expanded on the arguments made by both the prosecution and defence. The lack of differences across the variables suggest that after discussing the case, mock-jurors used evidence that incorporated real-world knowledge or examples, irrespective of whether they were persuaded or not ('*Most companies do have measures in place in order to deal with hacking etc. However, data encryption is ever changing and upgrading'* [FB4]).

Theme 2: References to the accused. Interestingly, South-Asian participants were more likely to reference the company as an entity in their reasoning for the final verdict (55.9%). However, less than a third (30.3%) of the British sample solely used the third

person plural pronoun 'they' or referenced DataStore. This pattern was not found prior to the interaction, indicating that exposure to a discussion which contradicts and challenges initial judgments brings about cultural differences in linguistic style. There were no meaningful differences across the persuasion groups, or indeed for gender and cognitive style with regards to referencing the accused post-discussion.

Theme 3: Reasoning for verdict choice. Exactly the same result (13.6%; *n* = 6) regarding moral reasoning and persuasion was found in the post-questionnaire as the pre-questionnaire. This shows that despite changing their verdict, persuaded mock-jurors still reason fairness and justice, but now for the opposing choice. Therefore, to persuade individuals with a moral reasoning for their initial verdict, perhaps the confederate mock-jurors appealed to this cognitive processing, thus using arguments of fairness and justice to change the mock-jurors opinion. For example, one mock-juror commented that '*He (*the confederate mock-juror*) made some excellent points with regards to the justice system and how it works and also how the managing director cannot be 100% blamed for the situation'* [FB17]. Whilst another mock-juror who was persuaded and reasoned this was due to moral arguments stated, '*my partner made me see how it was unfair to blame this one man for the fault of an entire company'* [FB3].

Another interesting finding concerns the lack of evidence (QCA code 12). Once again, this mirrors the pre-questionnaire where individuals low in NfCC and delusional thinking reported that their verdict was due to a lack of evidence both in the jury discussion and case summary. It implies such mock-jurors experienced a level of cognitive dissonance and didn't receive enough information or evidence to make a firm and final verdict choice '*the arguments are theoretical… the lack of evidence does not prove whether he is or isn't guilty'* [MB7]; '*it would be unfair to put an innocent man in prison without further info, there should be reasonable doubt'* [FB11]. Alternatively, no-one high in these measures mentioned the lack of certainty and evidence in their questionnaires

despite this being an argument to which confederates put across in the jury discussion (see Appendix D).

   Theme 4: Attribution of responsibility. There was a similar distribution for attribution of responsibility across the persuaded and non-persuaded groups, with the majority attributing guilt to DataStore/the managing director. However, 13.6% of the persuaded group seemed to reach a half-way house, claiming that DataStore as a company was guilty, but the individual (managing director) him/herself was not guilty (QCA code 601). Thus, this argument feeds into QCA code 8, which incidentally has the same percentage of mock-jurors (see above in Theme 3). No-one who wasn't persuaded fell into this category. Further, it is interesting to note that all of the mock-jurors who fell into QCA code 601 were female, and 83.3% (5 out of 6) of the individuals in this category were British. It seems that british females go further than the case summary in their reasoning, highlighting the gap between the company being guilty, and the difference of this to the managing director being guilty.

   Theme 5: Persuasiveness of the confederate. Of those not persuaded, the highest scoring category related to QCA code 156, which depicts that the confederate said some persuasive points, but these were not enough to change mock-juror's opinion (43.5%). Thus, it is noted that the discussion was persuasive, despite some mock-jurors being resistant to changing their verdict as a result of this. In contrast, 59.1% of the persuaded sample state they changed their verdict due to the persuasive messages pointing out new ways of thinking or interpreting the information. For example, '*the jury partner did state some good points which helped change my decision and the way that I was thinking towards it'* [MA14].

   4.3% of the not-persuaded individuals stated that the confederate mock-juror was too rigid and didn't listen to their point of view, perhaps serving to crystalise the mock-jurors' viewpoints even further. However, 4.5% of the persuaded group similarly stated

that despite being persuaded they felt their confederate mock-juror was rigid in their exchanges; '*They were persistent on the fact that they believed that there should have been the up to date safety measures. I do feel the discussion was a little single sided*' [MA10]. This shows that a very small number of participants felt that the conversation was pushy or one-sided, and of those that did, it did not have an influence on the persuasion outcome.

  Theme 6: Communication during the discussion. Over half (52.2%) of the mock-jurors thought the discussion using the VRE was pleasant and friendly, whilst 10.4% failed to provide feedback on the communication during the jury discussion. 8.7% of the not-persuaded sample stated that the discussion was interesting and productive, '*Very interesting and was good to see what decisions the other person came to and how*' [FB6]. This is despite the fact they ultimately disagreed with the confederate mock-juror.

  Theme 6: Communication as a result of the VRE. Most people (91%) did not comment on the environment (it was not specifically asked in the questionnaire). Of those that did, all of them were persuaded. 4 out of 6 that commented mentioned the VRE in a positive light. For example, one mock-juror mentioned that communicating using the VR headsets inside the environment was '*very easy, hearing their voice and seeing head nods and shakes despite it being in VR felt quite natural*' [MB16]. Another mock-juror mentioned that they could understand using the VRE in legal setting having experienced the VRE in the discussion, '*No it was not hard to communicate. In some circumstance I would think it is less intimidating than being in court surroundings or having to see the person outside*' [FB12].

  Theme 7: Additional comments. Of the mock-jurors who decided to comment further (17.9%), most views were focused on the VRE. Persuaded mock-jurors tended to comment positively: '*The oculus rift was cool*' [MA6]; '*VR was fun!*' [MB20]. Whereas 8.7% of the not-persuaded mock-jurors had something negative to say about the VRE. Considering that no-one in this sub-group commenting positively on the environment, it

indicates that a negative opinion of the environment used to discuss persuasive messages influences subsequent persuasion: '*The other avatar never looked directly at me. Use of body language would be interesting aspect to be in the research or further research*' [FB15].

6.3.7   **Presence inside the VRE.** Presence was analysed using the presence questionnaire, (PQ) assessing the extent to which mock-jurors 'forgot' the real-world and became immersed in the VRE. The minimum and maximum scores range from 25-175, with a larger score indicating a higher degree of presence. Across the entire sample, mock-jurors scored a mean average of 116.25 (SD = 19.49). A series of univariate ANOVAs revealed non-significant VRE immersion effects for Gender, *Welch's F* (1, 51.10) = .01, p = .928, Ethnicity, F (1, 65) = .03, p = .868, Persuasion, F (1, 65) = .21, p = .649, NfCC *Welch's F* (1, 22.65) = .05, p = .827, and PDI-R F (1, 31) = 2.66, p = .113.

6.3.8   **Simulator sickness (SSQ).** To understand whether mock-jurors who claimed to have a history of motion sickness or were currently feeling unwell at the start of the research correlated with subsequent higher scores in the simulator sickness questionnaire (SSQ), a Spearman's correlation was conducted. This revealed a non-significant relationship between the pre-SSQ and SSQ post-VRE discussion, r (53) = .18, p = .202. The SSQ is comprised of three subscales: disorientation (Range: 0 - 389.76), oculomotor (Range: 0 - 212.24) and nausea (Range: 0 - 267.12) which contribute to the overall score of simulator sickness (Range: 0 - 314.16). A higher value in either categories representing an increased feeling of simulator sickness. As seen in Figure 6.9, mock-jurors felt very little effects of simulator sickness overall (*Mode* = 0; *M* = 21.32, *SD* = 29.52), with the majority of participants self-rating no, or very little effects of nausea (*Mode* = 0; *M* = 12.96, *SD* = 24.39), oculomotor (*Mode* = 0; *M* = 20.14, *SD* = 24.39) or disorientation

(*Mode* = 0; *M* = 23.48, *SD* = 35.21) as a result of the VRE. A univariate ANOVA for total

SSQ and Persuasion additionally revealed that SSQ did not affect mock-jurors persuasion

outcomes, $F(1, 65) = 1.03$, $p = .314$.
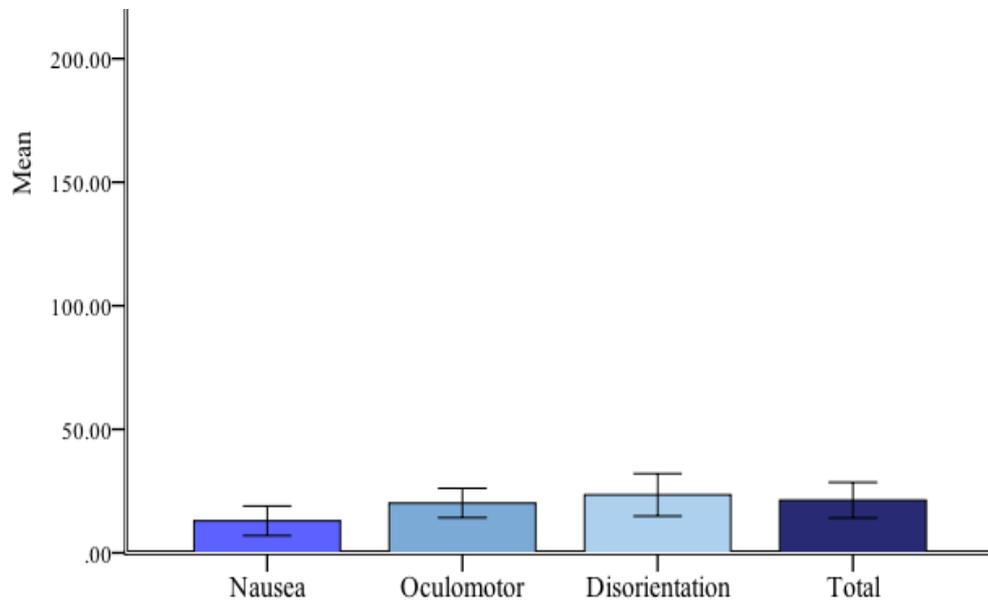
Figure 6.9. Bar graph showing the total mean SSQ scores, broken down by the three sub-categories. Error bars denote 95% confidence intervals of the mean.

6.3.9   Confederate mock-jurors.

6.3.9.1   *Word count.* To investigate whether the confederate mock-jurors varied in

their word count to participants (referred to as 'status' of mock-juror), and whether

persuasion was influenced as a result, a 2 x 2 between-factor ANOVA was conducted. This

revealed a non-significant effect for status, $F(1, 130) = 1.64$, $p = .20$, as well as a non-

significant interaction between status x persuasion, $F(1, 130) = 1.69$, $p = .19$, indicating

that the confederate mock-jurors did not dominate, or sit back and neglect the

conversations, with both parties contributing equally to the discussions, which did not

influence or interact with persuasive outcomes.

6.3.9.2 *Social ratings of the confederate mock-juror.* Mock-jurors were asked to rate their jury partner on a Likert scale from 1-5 concerning how friendly (1 = *very unfriendly*, 5 = *very friendly*), aggressive (1 = *very aggressive*, 5 = *very passive*), and sociable (1 = *very sociable*, 5 = *very unsociable*) they perceived their discussion partner. Mann Whitney *U* tests were carried out for ethnicity, persuasion and gender (see Table 6.7). South-Asian mock-jurors rated their confederate mock-juror, of the same ethnic group, as significantly more passive and less aggressive than british mock-jurors interacting with a british confederate.

Table 6.7 (continued overleaf)

Descriptive statistics and Mann Whitney U results for mock-jurors' ratings of the confederate mock-juror, for ethnicity, gender and persuasion groups

	Sociable				
	Mean rank	*U*	*z*	*p*	*r*
Ethnicity	South-Asian = 23.35 British = 21.91	175.00	-.35	.727	-.05
Gender	Male = 25.45 Female = 20.85	200.50	-1.29	.197	-.19
Persuasion	Persuaded = 22.44 Not persuaded = 24.25	199.50	-.47	.636	-.07

Table 6.7 (continued)

Descriptive statistics and Mann Whitney U results for mock-jurors' ratings of the confederate mock-juror, for ethnicity, gender and persuasion groups

	Friendliness					Aggressiveness				
	Mean rank	U	z	p	r	Mean rank	U	z	p	r
Ethnicity	South-Asian = 35.19 British = 32.77	520.50	-.54	.592	-.06	South-Asian = 38.40 British = 29.47	411.50	-2.09	.037	-.25
Gender	Male = 32.63 Female = 35.41	514.50	-.62	.538	-.07	Male = 31.40 Female = 36.68	472.50	-1.24	.217	-.15
Persuasion	Persuaded = 34.94 Not persuaded = 32.20	464.50	-.58	.563	-.07	Persuaded = 32.07 Not persuaded = 37.70	421.00	-1.25	.211	-.15

6.3.9.3 *Physical perceptions of the confederate mock-juror.* Mock-jurors were asked who they thought they were interacting with inside the VRE, given the anonymity of the research paradigm. Mock-jurors, on the whole, correctly identified who they were talking to (when asked what the confederate mock-juror's ethnicity and gender was): 100% of the male mock jurors identified their jury partner was female; 91.7% of females correctly identifying their partner as male; 81.8% of british mock-jurors correctly identifying the confederate as british; 64.7% south-asian mock-jurors correctly identified the within-group confederate mock-juror, with 29.4% of the group believing they were talking to a british individual.

6.3.10 **Summary of results.** Almost 66% of participants were persuaded to change their verdict choice following discussion with an avatar-version of the confederate mock-juror inside an immersive virtual reality environment. Ethnicity did not influence this distribution, nor did gender. However, when both of these variables were combined and broken down, it revealed differences specifically within the British sample, whereby British males had an almost 50:50 split regarding persuasive outcomes. Yet British women were more likely to be persuaded (over 70%) than not. Differences in persuasion across ethnic and gender divides however did not significantly differ, and there were no gender differences observed in the South-Asian sample.

Results regarding the influence of confidence in verdict choice both before and after the discussion revealed that meta-cognitive confidence in decisions did not significantly differ for persuasion, gender and ethnic groups. However, the change in confidence, measured pre- to post-discussion, did reveal that persuaded mock-jurors increased their confidence, on average by 42.5% whereas not persuaded mock-jurors on average, increased their confidence by 13.48%.

The two cognitive style measures were not related and did not result in any differences for gender or persuasion. Interestingly, delusional thinking highlighted how South-Asian mock-jurors scored much higher (mean of 73.68) than British participants (mean of 38.39). Additionally, analysis on individuals scoring either high or low in cognitive style further revealed how participants high in delusional thinking had higher pre-discussion confidence compared to those low in this measure but post-confidence did not significantly differ, nor did persuasion or duration in either cognitive style measure.

On average, the jury discussion lasted for just over 8 minutes. There was a difference in duration of discussion between the persuaded groups though, with persuaded mock-jurors reaching a unanimous decision quicker (06:51) than mock-jurors who disagreed with the confederate mock-juror (11:14). Not only were persuaded mock-jurors quicker, but they also said fewer words (548); almost half the contribution when compared to non-persuaded mock-jurors who said, on average 1081 words in around 11 minutes. Word count significantly influenced persuasion, accounting for 15% of the variation.

Analysis of linguistic style using LIWC software revealed similarities for gender and persuasion. However, ethnicity displayed significant differences. For example, South-Asian participants spoke with greater affect and tone compared to British participants, who themselves spoke with a higher rate of analytical reasoning in their speech, with the confederate mock-juror of the same ethnic background. Analysis of the epistemic modality dictionary and its output regarding high or low in expressed confidence and doubt showed similarities across all variables (gender, ethnicity and persuasion), as well as no differences between the mock-jurors speech, and the confederate mock-jurors speech – despite the confederate mock-juror being the persuader in this scenario, and the mock-juror being the persuadee.

Linguistic style matching (LSM) showed no differences in synchronicity of speech for persuaded groups. However, when LSM was broken down into quarterly time units, it

revealed a difference in persuasion whereby persuaded mock-jurors increased their LSM initially but then decreased in synchronicity when the discussion was coming to an end. Non-persuaded mock-jurors LSM shows an almost reverse effect in that individual decreased in LSM initially but in the last quarter of the discussion, increased their synchronicity of language to that of the confederate mock-juror.

Most mock-jurors used the core arguments as a basis for their pre-discussion decisions but expanded beyond the evidence provided, citing their own knowledge or experience in line with the provided arguments. Mock-jurors who were not-persuaded primarily referenced both the company and the individual when explaining their reasoning for the initial verdict, which is in comparison to persuaded mock-jurors, who primarily referred only to the company itself rather than the individual, indicating a more holistic view of the scenario for non-persuaded mock-jurors. Furthermore, not-persuaded individuals were more likely to use analytical reasoning to justify their verdict than mock-jurors who would go on to be persuaded.

Post-discussion, there was a lack of differences across the variables when asked what evidence they used to inform decision-making: mock-jurors used evidence that incorporated real-world knowledge or examples, irrespective of whether they were persuaded or not. South-Asian participants were more likely to reference the company as an entity in their reasoning for the final verdict (55.9%), yet less than a third (30.3%) of the British sample solely used the third person plural pronoun 'they' or referenced DataStore. Individuals low in NfCC seemed to experience some form of cognitive dissonance, in reporting a lack of evidence and information to make a firm and final decision. Most persuaded participants stated they changed their verdict because the confederate mock-juror highlighted missing information or revealed new ways of interpreting the evidence.

Commenting on and analysing the VRE as an environment revealed that over half of all participants commented on the VRE in a pleasant and friendly manner when it came

to the ability to communicate. Of those that commented in a negative light, all were not-persuaded to change their mind indicating a negative perspective on the environment influences subsequent shifts in opinion. To assess the extent to which mock-jurors 'forgot' the real-world and became immersed in the VRE, presence was measured. It revealed high scores across the various variables implying the VRE was successful in being immersive and this did not contribute to differences in persuasive outcomes. Simulator sickness was also analysed, showing very low scores in all sub-themes demonstrating that the VRE created in this study did not have adverse effects for most mock-jurors, and for those that did mention they felt sick, it did not affect their performance and social cognition inside the VRE.

Finally, social ratings for the confederate mock-jurors were taken to understand mock-jurors' perceptions of the confederates when interacting using an avatar. It revealed that South-Asian participants rated their South-Asian confederate as more passive and less aggressive than the British mock-jurors rating their British confederate. There were no other differences for ratings of sociability and friendliness for either ethnic, gender or persuaded groups. Given that participants interacted with the confederate via a real-time voice equipment, most mock-jurors identified their partner's ethnicity and gender correctly.

6.4 Discussion

This final experiment investigated persuasion in an immersive virtual environment, mirroring the JM method employed in the previous two experimental chapters. The primary findings show how the majority of participants were persuaded to change their verdict post-discussion. Participants experienced high levels of presence whilst discussing the jury scenario which supports the second prediction made in this chapter. This second hypothesis envisaged high levels of presence given the immersive and collaborative nature

of the synthetic environment, which predicted would in turn, lead to increased success rates for persuasive outcomes, which the findings support. Presence is considered to be a central and distinctive feature of a VRE (Grigorovici, 2003) and is interchangeable with immersion (McMahan, 2003). Indeed, a comprehensive literature analysis by Suh and Prophet (2018) revealed that immersive technologies enhance collaboration and engagement. The high level of presence found within the current study indicates that the VRE enabled participants to have a sense of 'being there'; immersed in the synthetic discussion with another avatar. Furthermore, hearing a human voice in real-time arguably served to increase cooperation and persuasion outcomes and so this too may have contributed to the VRE persuasion effect. Here, participants interacted with the confederate mock-juror through a headset, which relayed real-time human voice which is in line with Zanbaka et al.'s (2006) work, revealing that attitude change was just as effective when using avatars with human voices as real speakers. This enhanced interactivity increases the social aspect of presence (Skalski & Tamborini, 2007), with social presence in turn improving real-time exchanges. It appears that here too the interactive and collaborative nature of the VRE, alongside good levels of presence and participants inhabitation of an avatar, increased persuasion outcomes.

These findings support one of the few studies which have attempted to investigate the impact of interactivity by allowing participants to change the order in which pre-recorded persuasive messages were shown (Skalski & Tamborini, 2004; 2007). The research investigated the impact of interactivity and social presence on the processing of a persuasive message, utilising the framework of the heuristic-systematic model within synthetic communication modalities. Skalski and Tamborini found that an interactive agent instilled a greater sense of presence in participants, whilst presence itself increased the focus towards the avatar and the arguments portrayed. This supports the concept that presence can increase motivation for information processing. The current findings

presented in this chapter lend further credence to the area of attitude change and VR, highlighting how immersive synthetic realities can be an effective means to persuading someone to change their mind. Furthermore, it serves to expand the existing literature, enabling the measurement of realistic bilateral exchanges.

The first prediction made in this chapter refers to gender differences in persuasion outcomes, with females thought to behave in a manner consistent with gender stereotypes - wising to form a bond with their opposing avatars, being more communal in nature and thus more prone to changing their verdict choice. Despite the current findings revealing no gender differences, variances did emerge for the British sample - males were at the chance level for persuasion, yet British women were more likely to be persuaded (over 70%) than not. Perhaps this finding is reflective of previous research which has predominantly focussed on Caucasian samples, reporting that women prefer to focus on creating and maintaining relationships and tend to be much more accepting of other people's perspectives (Eagly & Carli, 1981). Thus, this study which has manipulated ethnicity and gender serves to 'water down' gender effects - indicating that gender may not be a sole cause of differences previously observed in varying media rich modalities, but rather an interaction between ethnicity and gender.

Differences in linguistic style across the ethnic groups were significant in this study. Here, South-Asian participants spoke with greater affect and tone compared to British participants, who themselves had a higher rate of analytical reasoning in their verbal output during the discussions with an avatar of the same ethnicity. Higher levels of analytical style captures concrete and logical thinking (Pennebaker, Chung, Frazee, Lavergne, & Beaver, 2014). This result indicates that the British sample were more formal and hierarchical in their linguistic output which lends itself to differences reported historically regarding Ind/Col cultures. For example, Nisbett and Masuda (2003) argue that individualistic cultures are more inclined to attend to a focal object and categorise this in

an attempt to establish rules governing behaviour. However, caution may be needed in the interpretation of these findings given that analytical linguistic style is a new addition to the LIWC software, derived from previous research into written college essays (rather than verbal speech), measuring academic performance on a categorical-dynamic index.

LSM results revealed inverse effects for persuasion at times 1 and 4 of the jury discussions. For the first quarter, mock-jurors who were persuaded increased in their synchronicity of language to the confederate. Conversely, mock-jurors who resisted persuasion initially decreased in their LSM upon realising the confederate mock-jurors had the opposing viewpoint. Yet in the final quarter of the discussion, whereby unanimous agreements were made for the persuaded mock-jurors, LSM reduced between the two avatars and this was significant when compared to non-persuaded mock-jurors who increased in their LSM scores during this final quarter. If engagement rather than rapport is the key to coordination (Niederhoffer & Pennebaker 2002; as argued in Study 1's discussion), then this implies that once a unanimous decision was made, LSM reduced as participants engagement in the conversation waned. Comparably, non-persuaded interactions continue to debate and argue until a decision is made to stop the discussion– implying that individuals were highly engaged until the termination of the discussion. Verbalising your point of view and engaging in debate to argue your point of view can bolster resistance (McGuire, 1964; Tormala & Petty, 2002). Perhaps non-persuaded mock-jurors become motivated to attempt to persuade the confederate mock-juror which could account for the increase in LSM towards the end of the discussion.

Previous studies have commented on the role that avatars play on decision-making and behavioural outcomes. Indeed, the Proteus effect states that individuals conform their online behaviour to match that of their digital selves (Yee & Bailenson, 2007). The current study restricted the customisation of the avatars down to skin, hair colour and gender given the novelty of the environment and the restrictions placed upon the creation of such an

226

immersive VR. Furthermore, given that this VRE utilised immersive HMD technology, participants were often unable to monitor and observe their customisation given their 'embodiment' of the avatar inside the VRE. Thus, analysis of avatar choices was not deemed appropriate for this study. Nevertheless, it was clear that the majority of participants did customise their avatar in a similar vein to themselves (choosing the same gender and skin colour). Furthermore, comments on the additional demographic questions (Appendix R) revealed that of the participants who stated they use an avatar whilst online ($n = 22$), most, when they had the opportunity to customise their avatar, did so to reflect their real-life features and/or personality (E.g., '*I wanted it to look as realistic as me as possible so the person I was talking to felt a reassurance of who she was talking to*' [MB4]). This in itself supports research that most individuals choose to express themselves online in a way that is similar to their everyday self (Taylor, 2002). However, it would be interesting to further explore this idea through manipulation of avatar embodiment in future research.

Despite avatars representing the presence of mock-jurors as well as confederates, in fact all participants remained physically anonymous. Furthermore, the avatars were static, and although head movements mirrored the movements of participants in the real-world, behavioural cues/indicators were absent. Future studies could consider expansion into the field of non-verbal behaviours (e.g., Dodds, Mohler, & Bülthoff, 2011) given the recent rise in haptic feedback for VREs. Utilising tracking displays to recreate bodily movements and gestures inside the VRE might serve to increase the realness and presence felt, and further research would benefit from investigation of the role these behaviours can have on our persuadability and social cognition (see Maslow et al., 1971).

Chapter Seven: Persuasion Across Modalities: A Meta-Analysis.

7.1 Introduction

The previous experimental chapters investigate cognitive, linguistic style, ethnicity, and gender on persuasion in three distinct contexts (FtF, CMC and VR). However, each context has been analysed in isolation thus far. This chapter serves to directly compare results across modalities, and so provides an overview of the findings presented in this thesis, highlighting the similarities and differences across modalities, and interpreting these results with reference to the relevant empirical and theoretical literature. All three modalities are clearly different, and as such it was expected that the context would have an impact on persuasion outcomes. The novelty of this research is such that formulating hypotheses was challenging, although a series of hypotheses have been tentatively formulated throughout. However, for this chapter no hypotheses are articulated, rather this chapter is exploratory in nature and includes all data points spanning the entirety of this thesis.

7.2 Method

7.2.1 Participants. For this analysis all 197 mock-juror participants were included, comprising all three communication modalities (FtF $n = 66$; CMC $n = 64$; VR $n = 67$). Overall, the sample contained 50 British males, 48 British females, 49 South-Asian males and 50 South-Asian females. Mock-jurors' ages ranged from 18 to 63, with a mean of 24.54 years ($SD = 8.20$, $n = 179$).

7.2.2 Credibility of the jury method paradigm. All mock-jurors were asked whether they believed the case scenario and judge's instructions, provided in a jury booklet

was credible. These data have not been previously reported, rather it was deemed more appropriate to report these data utilising the overall sample given the previous three studies have all utilised the same paradigm. This question was asked using a four-point Likert scale, ranging from '*very credible*' to '*very incredible*'. Seventy four percent (73.6%) stated that they found the scenario 'quite', or 'very credible', adding realism and credibility to the arguments presented.

7.3 Results

The results reported here bring together the existing data from all three environmental modalities to compare, contrast and analyse any similarities and differences to the variables of interest, particularly with regard to persuasion outcomes and environmental modality.

7.3.1 Persuasion. In each of the previous research chapters (Chapters 4-6), persuasion was broken down into gender and ethnicity to investigate differences across the two groups for persuasion. Here, males were evenly split between being persuaded and not: 49 males were persuaded, and 50 resisted the persuasive attempts. Breaking this down further, twenty-two British males were persuaded, compared to 28 who were not. This mirrors the South-Asian males, where 27 persuaded while 22 were not (see table 7.1). However, more females were persuaded ($n = 62$) than not ($n = 36$). In particular, British females were more likely to be persuaded ($n = 32$), than not ($n = 16$). South-Asian females mirrored this pattern, but more South-Asian women resisted persuasion ($n = 20$) than the British sample. A binomial logistic regression was performed to ascertain the effects of modality, gender and ethnicity on persuasion outcomes. The model was non-significant, x^2 (3) = 4.11, p = .250, explaining just 3% (Nagelkerke, R^2) of the variance in persuasion outcomes.

7.3.1.1 *Persuasion across environmental modality.* Table 7.2 summarises the

breakdown of persuasion groups across each of the three studies manipulating

environmental modality for ease of reference.

Table 7.1

Summary of mock jurors' persuasion across all three environmental modalities

		Persuasion	
Study		Persuaded	Not Persuaded
FtF	*n*	46	20
	$\%_s$	69.7	30.3
	$\%_p$	41.4	23.3
	z	1.4	-1.6
CMC	*n*	21	43
	$\%_s$	32.8	67.2
	$\%_p$	18.9	50.0
	z	-2.5	2.8
VR	*n*	44	23
	$\%_s$	65.7	34.3
	$\%_p$	39.6	26.7
	z	1.0	-1.2

Note. n = observed count; $\%_s$ = percentage within study; $\%_p$ = percentage

within persuasion group; *z* = standardised residual.

There was a significant association between environmental modality and persuasion,

x^2 (2) = 21.56, *p* <.001, Cramer's *V* = .33. The FtF environment produced similar

persuasion outcomes to the VR environment, with persuasion equally as successful in both

FtF and VR contexts. However, persuasion outcomes in CMC were markedly different -

with as many people resisting persuasion as were persuaded in the other two studies.

Indeed, examination of the standardised residuals indicate that the low proportion of

persuasion in CMC compared to the other modalities (*z* = -2.5) contributed to the

significant result. Likewise, the high proportion of resistance to persuasion ($z = 2.8$) in comparison to FtF and VR modalities show that the CMC environment behaved in a significantly different manner to the other two contexts.

7.3.1.2 *Direction of persuasion.* The Pilot study (reported in Chapter 3) revealed an even split for participants initially choosing guilt or innocence. As demonstrated in Table 7.3, there is a pretty even split regarding the direction of persuasion across the sample. However, the standardised residual for individuals who initially chose a 'not guilty' verdict, and resisted persuasion (NG-NG) suggests a significant deviation from what is expected (exceeding -2; Sharpe, 2015), thus implying a significant difference between the observed and expected frequency counts. A one-sample goodness of fit chi-square test however, was non-significant, x^2 (3) = 7.73, p = .052, φ = .20 for direction of persuasion. Hence, verdict choice does not significantly affect persuasion outcomes, and a change from one verdict to another is not considered harder or easier to induce. Thus, findings within this thesis cannot be attributed to the strength of evidence provided in the case summary arguments.

Table 7.2

Frequencies for Direction of Persuasion and strength of association (n=197)

Direction of Persuasion	Observed (*n*)	Observed (%)	Expected (*n*)	Std. Residual (*z*)
G-NG	59	29.9	49.3	1.38
NG-G	52	26.4	49.3	0.38
G-G	53	26.9	49.3	0.53
NG-NG	33	16.8	49.3	-2.32

Note. G = guilty. NG = not guilty.

7.3.2 Confidence in verdict choices. To understand the interaction and differences in verdict confidence across all three studies and persuasion groups, two 3 (Study: FtF v CMC v VR) x 2 (Persuasion: persuaded v not-persuaded) between-factor ANOVAs were conducted for the pre- (Time 1), and post- discussion timepoints (Time 2). Two between-factor ANOVAs were utilised which allows analysis across the variables contained within each Time frame and thus not skew results. There was a significant main effect for persuasion at Time 1, $F(1, 188) = .5.78$, $p = .017$, $\eta_p^2 = .03$, with the persuaded group having lower initial confidence in their verdict ($M = 66.49$, $SD = 19.24$) than those who resisted persuasion ($M = 73.06$, $SD = 20.57$). There was no significant main effect for the three types of environmental modalities (Study) on pre-discussion confidence of verdict choice, $F(2, 188) = .38$, $p = .681$. Additionally, the interaction for persuasion x study at Time 1 was non-significant, $F(2, 188) = .49$, $p = .611$ (See Figure 7.1).

Time 2 reflected the 3 x 2 ANOVA results at Time 1, with a significant main effect for persuasion, $F(1, 189) = 15.66$, $p < .001$, $\eta_p^2 = .08$. Subsequent pairwise comparisons revealed a mean difference of 12.76 ($SE = 3.22$), with the mean for persuasion in the final verdict choice being significantly lower ($M = 68.12$, $SD = 21.59$) than the mean confidence for non-persuaded outcomes ($M = 80.13$, $SD = 20.73$). The main effect for study was non-significant, $F(2, 189) = .83$, $p = .436$, as was the persuasion x study interaction, $F(2, 189) = 2.39$, $p = .094$ (see Figure 7.2). Across both time points, those who were persuaded had lower confidence in their initial and final outcomes, despite changing their verdict. On the other hand, those who resisted persuasion and thus did not change their verdict had higher confidence across both before and after the jury discussion, and this carried across all three different environments.

233
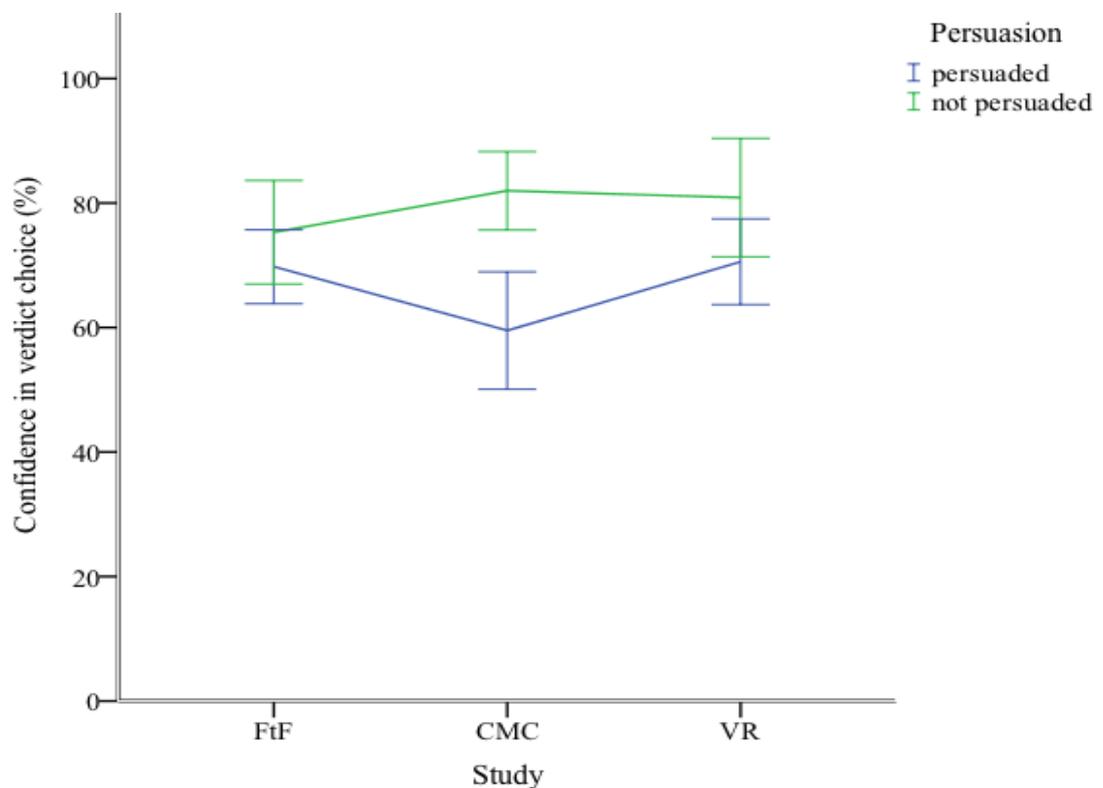
Figure 7.2. Percentage confidence in final verdict choice (Time 2) by Persuasion and Study. Error bars denote ± 2 standard error of the mean.

7.3.2.1 ***Absolute confidence change in verdict choice.*** Absolute confidence change was calculated in line with the existing chapters and Table 7.4 summarises the average change in confidence for verdict choice across the main variables. This shows that the confidence change for FtF and VR modalities were very similar, with an average of 30% change in confidence from pre- to post-discussion, irrespective of change in verdict. The CMC modality however, had almost half this change, indicating that exposure to persuasive messages via Google Hangouts did little to change their confidence in the verdict. Gender, Ethnicity and Cognitive Style samples had similar mean confidence changes showing no substantial differences. Persuasion shows the biggest differences in confidence, with those who changed their verdict having a large change in confidence ($M = 40\%$) compared to those who resisted persuasion, having a mean change of 12%.

Table 7.3

The mean (M) and standard deviation (SD) for absolute change in confidence (0-100%)
for verdict choice across Study, Gender, Ethnicity, Persuasion and Cognitive Style groups

Factor	Levels	*M*	*SD*
Study	FtF	31.86	25.71
	CMC	18.36	18.50
	VR	32.23	24.46
Gender	Male	25.46	24.69
	Female	29.55	22.95
Ethnicity	British	25.96	24.65

	South-Asian	29.01	23.09
Persuasion	Persuaded	39.75	22.65
	Not Persuaded	12.05	14.69
NfCC	High	30.83	26.13
	Low	24.71	22.12
PDI-R	High	30.98	24.82
	Low	26.06	22.06

To understand the interaction between environment and persuasion when absolute confidence had been calculated, a 3 (Study: FtF v CMC v VR) x 2 (Persuasion: persuaded v not persuaded) between-factor ANOVA was conducted on absolute confidence for verdict choice. This revealed a significant interaction between study and persuasion, F (2, 186) = 7.36, p = .001, η_p^2 = .07 indicating that any difference between absolute change in confidence is dependent on whether that person is persuaded or not, and the environmental modality they discuss the verdict in (see Figure 7.3 for a graph of this interaction). Simple effects analysis was conducted via syntax. This allows for exploration of the interaction by examining the difference between groups within one level of the IV, as interpretation of the main effects can be considered misleading and otherwise incomplete.

Given there were six tests of simple effects, the criterion for significance was adjusted to .0083 to control for Type 1 error. Subsequent simple main effects indicated that the interaction effect resulted from the persuaded sub-sample, with a significant univariate result for confidence change, F (2, 186) = 6.77, p = .001, η_p^2 = .07. Post-hoc tests revealed both FtF and VR modalities had increased absolute confidence change compared to the CMC modality (FtF > CMC: *Mdiff* = 17.40, p = .001; VR > CMC: *Mdiff* = 16.31, p = .001). The VR and FtF modalities show a similar confidence change for verdict choice (FtF = VR: *Mdiff* = 1.09, p = .789; see Figure 7.3). The not-persuaded sample did not produce a significant result for absolute confidence change, F (2, 186) = 1.88, p = .155.

The absolute confidence change was not different across the three studies, with post-hoc pairwise comparisons confirming no significant mean differences across the three modalities when mock-jurors were not persuaded (all p's > .01).
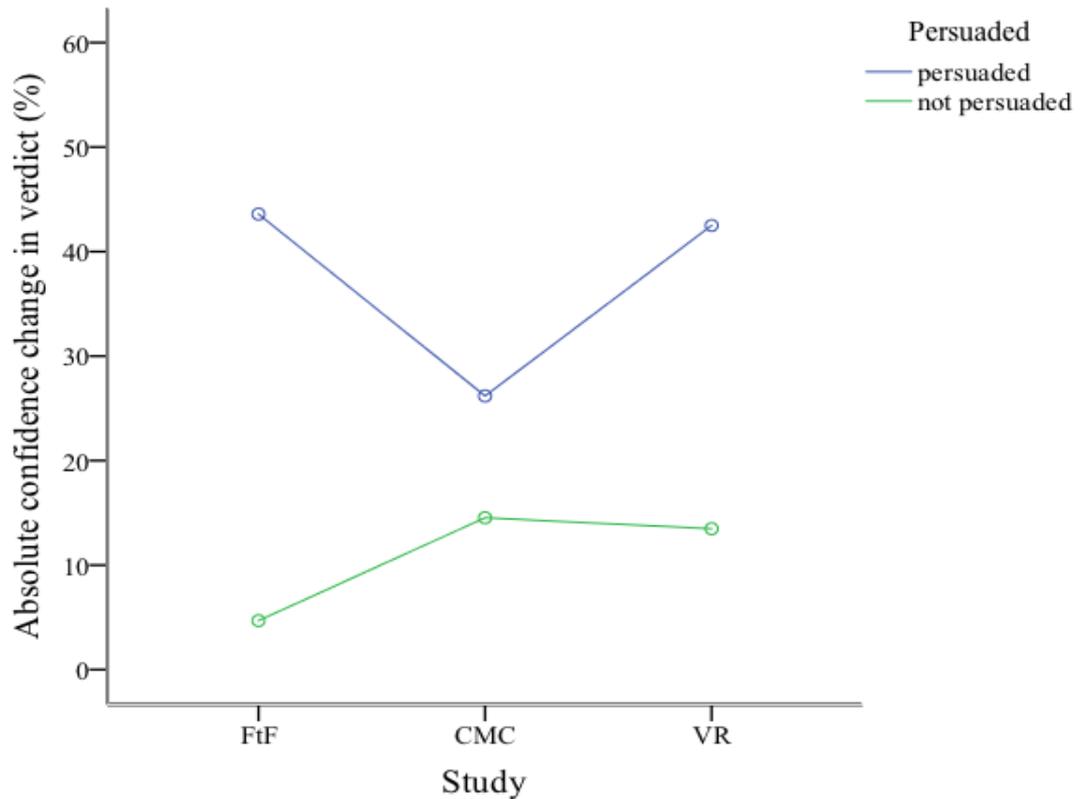
Figure 7.3. Interaction of Environmental modalities (Study: FtF, CMC and VR) and Persuasion (persuaded or not-persuaded) on absolute confidence change in verdict choice.

7.3.2.2 *Direction of absolute confidence.* Absolute confidence direction for all three studies was entered into a 3 x 3 crosstabulation (see Table 7.5) to understand whether environmental modality influenced the direction of confidence for verdict choice. This revealed very similar results for the FtF and VR studies, whereby the majority of mock-jurors increased their confidence post-jury discussion, regardless of persuasion outcome. Interestingly, the same amount of mock jurors were observed decreasing their confidence

across all three studies, and this remained low across the environmental modalities. As seen in Table 7.5, a high proportion of the CMC mock-jurors did not differ in confidence for their decision, despite the majority of participants resisting persuasion.

Table 7.4

A 3 x 3 absolute confidence direction x study crosstabulation test for independence. Statistics show observed counts (n), and standardised residuals in brackets (z)

	FtF	CMC	VR
+	41 (.3)	31 (-1.4)	47 (1.1)
-	6 (.0)	6 (.0)	6 (.0)
/	16 (-.5)	27 (2.0)	12 (-1.5)

Note. + = increase in confidence for verdict choice from pre- to post-discussion; **-** = decrease in confidence for verdict choice from pre- to post-discussion; / = no change in confidence for verdict choice from pre- to post-discussion.

A chi-square test for independence was conducted to assess whether persuasion led to an increase, decrease or unchanged confidence in verdict. Across both persuaded and non-persuaded groups, very few mock-jurors decreased their confidence post-jury discussion. The chi-square statistic was significant, x^2 (2) = 55.33, $p < .001$, $\varphi = .54$, with analysis of the standardised residuals indicting that both the increase (persuasion $z = 2.8$; not-persuaded $z = -3.1$) and no change cells (persuasion $z = -4.1$; not-persuaded $z = 4.6$) significantly contributed to the chi-square value, albeit in opposing directions. Additionally, follow-up goodness of fit chi square tests confirmed these results: Persuaded x^2 (2) = 26.99, $p < .001$, Cramer's $V = .26$; Not-Persuaded x^2 (2) = 119.68, $p < .001$, Cramer's $V = .56$.

7.3.3   Cognitive style. Due to an increased data set, cognitive style was correlated to understand whether the two variables were related. Due to parametric assumptions being violated for PDI-R regarding skewness (1.27, $SE = .174$), Spearman's rho was conducted. This revealed a non-significant relationship between the two cognitive style measures, r (195) = .11, $p = .130$.

To compare cognitive style distribution of scores across different modalities, gender and ethnic groups researched in this thesis, two 3 (Study: FtF, CMC, VR) x 2 (Gender: male, female) x 2 (Ethnicity: South-Asian, British) between-factor ANOVAs were conducted for each cognitive style measure (PDI-R and NfCC). There were non-significant main effects (all F's < 2.43, all p's > .091) and non-significant two-way interactions for NfCC, all F's < .66, all p's > .517. Delusional thinking also produced non-significant main effects for both modality and gender, all F's < 1.25, all p's > .288, indicating that the average cognitive style scores did not significantly differ across each study and thus subsequent findings indicate that study may not be considered an extraneous variable regarding cognitive style.

However, the main effect for ethnicity was significant, $F(1, 183) = 18.84$, $p < .001$, $\eta_p^2 = .09$, with mean scores showing British participants produced a mean score of 41.04 ($SE = 3.42$) compared to the South-Asian participants, scoring a significantly higher average of 62.00 ($SE = 3.40$). The two-way interactions were non-significant, all F's < 2.98, all p's > .051.

Furthermore, the three-way interactions for both NfCC, $F(2, 184) = 1.70$, $p = .185$ and PDI-R, $F(2, 183) = 1.20$, $p = .303$ were non-significant.

7.3.3.1   *High and low in cognitive style*. As with previous data sections, cognitive style was split into quartiles using data from across all three studies; the top and bottom 25th representing mock-jurors scoring high or low in NfCC and delusional thinking. Fifty-

two mock-jurors fell into the low PDI-R (< 26), 46 scored highly in PDI-R (> 69), 51 mock-jurors were low in NfCC (< 145), and 47 were high in this NfCC (> 169).

Looking at the distribution of mock-jurors falling into the above categories, chi-square tests for independence were conducted for gender, ethnicity and persuasion across both cognitive style measures. Thus, highlighting patterns of the distribution across these new categories, and better understanding whether the three variables have differences in cognitive style. Gender and NfCC was not-significantly associated, $x^2(1) = .99$, $p = .418$, neither was ethnicity and NfCC, $x^2(1) = .37$, $p = .686$, or persuasion and NfCC, $x^2(1) = 1.59$, $p = .229$. Gender and PDI-R was non-significant, $x^2(1) = .05$, $p = .843$, as was persuasion and PDI-R, $x^2(1) = .21$, $p = .688$. However, ethnicity was significantly associated with delusional thinking, $x^2(1) = 17.82$, $p < .001$, $\varphi = .43$, with a high number of British mock-jurors scoring low in PDI-R ($n = 38$) compared to South-Asian participants ($n = 14$). This trend is reversed for the high category, whereby 32 South-Asian mock-jurors fell into this category, compared to 14 British participants.

Regarding confidence in verdict prior to the discussion and confidence in verdict post-discussion, individuals high or low in the two cognitive style measures could feasibly influence such results. However, this was not the case for both NfCC pre-discussion, F (1, 95) = .53, $p = .466$, and post-discussion F (1, 96) = .59, $p = .443$. These results highlight no differences in the mean scores for high and low NfCC mock-jurors' confidence both before and after the jury discussion. Delusional thinking additionally revealed similar findings for both the pre, F (1, 95) = 2.04, $p = .156$, and post-discussion ANOVAs, F (1, 95) = .01, $p = .915$.

7.3.4 Duration of jury discussion. Duration was defined as the total amount of time (to the second) that dyadic pairings discussed the jury scenario. To investigate whether duration varied as a function of study, a univariate ANOVA was conducted to

239

analyse differences in mean duration. The VR study revealed the shortest duration for the jury discussion, on average ($M = 505.92$ $SD = 376.94$), followed closely by the FtF discussion ($M = 646.24$, $SD = 463.53$). The CMC study however, had more than double the average duration ($M = 1635.94$, $SD = 764.29$). Welch's F revealed a significant difference across the studies for duration of discussion, $F(2, 120.57) = 56.98$, $p < .001$, $\eta_p^2 = .45$, 95% CI (815.08, 1025.01). Games-Howell post-hoc tests (depicted in Figure 7.4) revealed a significant mean difference between CMC and both VR ($p < .001$, M $diff. = 1130.01$, 95% CI [877.32, 1382.71]) and FtF durations ($p < .001$, M $diff. = 989.69$, 95% CI [725.08, 1254.31]). There was no significant difference between VR and FtF studies ($p = .139$, M $diff. = 140.32$).
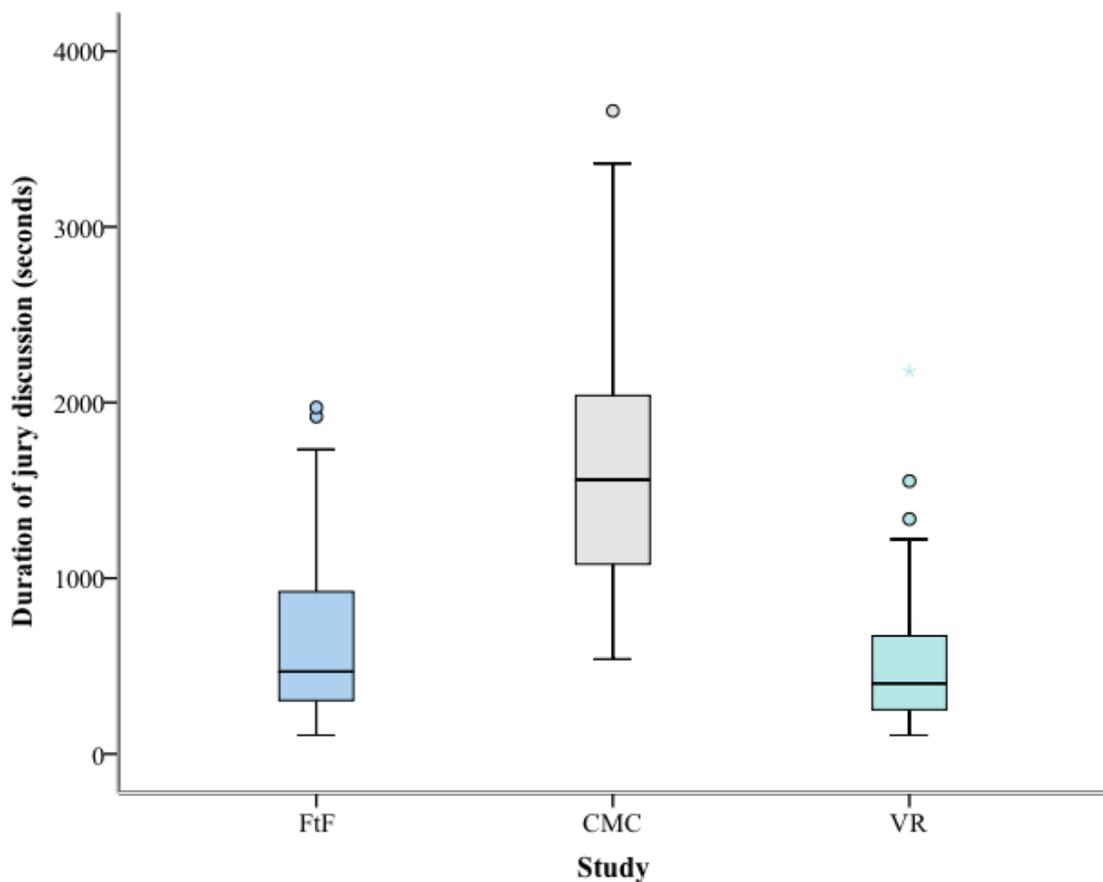
Figure 7.4. Box plot showing the inter-quartile range (IQR) for duration of jury discussion across the three studies presented in Chapters 4 to 6 (FtF, CMC, and VR). Whiskers represents top and bottom 25% of scores, whilst individual data points highlight outliers.

To further corroborate findings from the previous chapters regarding gender and ethnicity, data from all three studies were combined to analyse the differences in duration of jury discussion. This revealed non-significant findings for both gender, F (1, 195) = .09, p = .758, and ethnicity, *Welch's F* (1, 170.79) = 3.04, p = .083. Persuasion across all three studies was in line with previous results, whereby persuaded mock-jurors had much shorter durations for the jury discussion (M = 591.88, SD = 530.18) than those who were not persuaded and thus maintained their initial verdict choice (M = 1343.60, SD = 775.20), *Welch's F* (1, 143.23) = 59.36, p < .001, η_p^2 = .25.

Mock-jurors scoring low in delusional thinking had longer jury discussions (M = 1002.85 SD = 846.89) compared to mock-jurors scoring in the top 25th percentile for delusional thinking (M = 812.15, SD = 642.72). This however was non-significant, F (1, 96) = 1.54, p = .217, η_p^2 = .01. In contrast, mock-jurors high in their NfCC had longer discussion durations (M = 1052.13, SD = 889.81) than individuals low in this measure (M = 904.63, SD = 596.28), although this difference was again, not significant, *Welch's F* (1, 79.44) = .91, p = .342.

7.3.5 Linguistic style.

7.3.5.1 *Word count.* Word count data was analysed to understand whether duration correlates with word count across contexts. Indeed, observation of the means does not follow the duration pattern. Figure 7.5 shows that the longest jury discussion (CMC) has the lowest word count average (M = 350.37, SD = 223.25), given that participants had to write their arguments anonymously rather than verbalise them to a known entity; be that

an avatar (M [word count for VR] = 731.85, SD = 706.57) or real-life person (M [word count FtF] = 1010.07, SD = 912.89). These mean scores significantly differed across the studies, *Welch's F* (2, 101.56) = 24.84, $p < .001$, $\eta_p^2 = .14$, 95% CI (601.57, 800.13), with Games-Howell multiple comparison tests revealing significant mean differences between the CMC condition and both the FtF (*M diff* = 659.70, $p < .001$) and VR (*M diff* = 380.64, $p < .001$) modalities. The FtF and VR studies did not differ on word count (*M diff* = 279.06, $p = .106$). This shows that mock-jurors said more when they were conversing in real-time with a mock-juror than if they were completely anonymous and typing their responses.
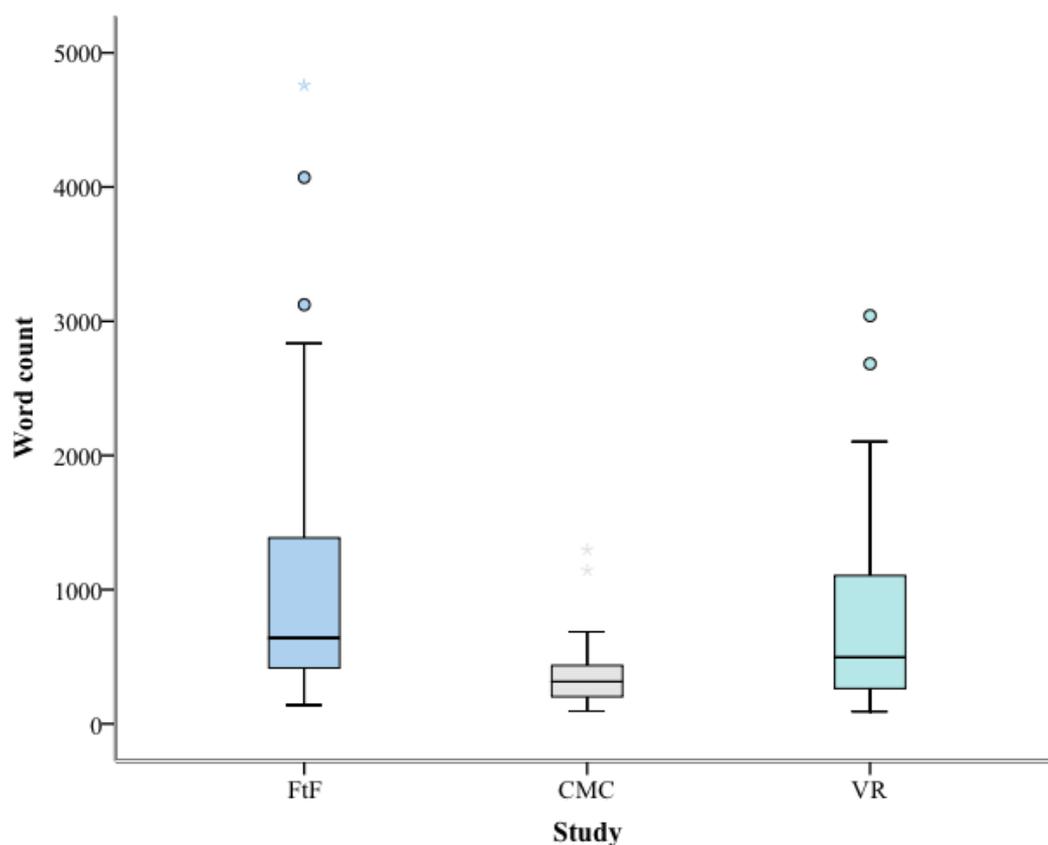
*Figure 7.5*. Box plot showing the inter-quartile range (IQR) for word count across the three studies presented in Chapters 4 to 6 (FtF, CMC, and VR). Whiskers represents top and bottom 25% of scores, whilst individual data points highlight outliers.

Despite gender not producing a significant finding for duration of jury discussion, here word count was significant, *Welch's F* (1, 165.48) = 6.45, p = .012. η_p^2 = .03, 95% CI (601.57, 800.13) with males speaking more (*M* = 826.08, *SD* = 833.04) than females (*M* = 574.34, *SD* = 524.87). Ethnicity sub-groups did not significantly differ on word count, *F* (1, 195) = .70, p = .40.

To understand whether participant mock-jurors, or confederate mock-jurors said more during the discussion, and the interaction of any differences across both study and persuasion, a 3 (Study: FtF v. CMC v. VR) x 2 (Status: participant mock-juror v. confederate mock-juror) x 2 (Persuasion: persuaded v. not-persuaded) between-factor ANOVA was conducted for word count. WC for study was significant, as mentioned in the above analysis. Persuasion was also significant, *F* (1, 132) = 85.21, p < .001, η_p^2 = .18, supporting previous findings in Chapters 4-6 that non-persuaded interactions resulted in a higher WC than successfully persuaded discussions. Status had no significant difference in mean scores regarding WC, *F* (1, 382) = .08, p = .774, η_p^2 < .01, highlighting that the jury discussions were evenly split during conversations.

A significant status x persuasion interaction emerged, *F* (1, 382) = 4.26, p = .040, η_p^2 = .01. However, post-hoc tests revealed no significant mean differences in WC across status for either persuaded (*p* = .182) or non-persuaded (*p* = .117) outcomes. There was also a significant interaction for study x persuasion, *F* (2, 382) = 23.85, p < .001, η_p^2 = .11. Subsequent pairwise comparisons using Bonferroni's correction highlighted significant differences in WC for all six post-hoc comparisons (*p*'s < .05). Study x status, and the three-way interaction of study x persuasion x status were not significant for WC (*p's* > .05).

7.3.5.2 *LIWC categories.*

7.3.5.2.1 *Linguistic differences across the three contexts.* LIWC contains ten linguistic categories of interest to the current research tapping psychological constructs, linguistic dimensions and informal language markers (Power and influence [clout], authenticity, tone, function words, affective, social and cognitive processes, drives, informal language and analytical thinking). A between-factor MANOVA was conducted for the three levels of Study to investigate any differences in the ten dependent variables outlined. Homogeneity of variance was violated, Box's $M = 371.28$, $F(110, 101594.35) = 3.13$, $p < .001$, meaning Pillai's trace was employed given it has been shown to be a robust statistic when there is heterogeneity of covariances (see Field, 2013). This produced a statistically significant effect, Pillai's trace = .85, $F(20, 370) = 19.16$, $p < .001$, $\eta_p^2 = .51$. Follow-up univariate ANOVAs (using Bonferroni's correction) and subsequent post-hoc tests are displayed in Table 7.6. This highlights significant mean differences for function words, affective processes, drives, analytical thinking and informal language. Successive pairwise comparisons are outlined in the table, showing a higher degree of affective language, drives and analytical thinking in the CMC modality than the FtF and VR environmental conditions. Specifically, almost a third of the discussion in the CMC was made up of analytical thinking, compared to under 10% for the VR and FtF studies. Additionally, there was less informal language during the anonymous CMC condition. The VR modality rated the highest for informal language use, followed closely by the FtF study. The FtF modality had higher usage of function words than the VR and CMC contexts.

Table 7.5

Descriptive statistics, follow-up univariate ANOVAs and post-hoc comparisons (Tukey and Games-Howell) for main effects of linguistic categories for all three studies (n = 197)

LIWC category	Study			Between-subject effects			Pairwise comparisons
	FtF	CMC	VR	*F*	*p*	η_p^2	
Clout	*M* = 46.34	*M* = 48.34	*M* = 46.52	.23	.794	<.01	-
	SD = 19.23	*SD* = 17.98	*SD* = 18.48				
Authentic	*M* = 29.72	*M* = 28.13	*M* = 34.25	1.48	.230	.23	-
	SD = 20.18	*SD* = 20.20	*SD* = 22.97				
Tone	*M* = 39.70	*M* = 36.61	*M* = 44.56	1.77	.174	.02	-
	SD = 21.05	*SD* = 25.74	*SD* = 26.22				
Function words	*M* = 64.46	*M* = 60.49	*M* = 61.75	24.14	<.001	.20	FtF>CMC*** VR=CMC FtF>VR***
	SD = 3.03	*SD* = 3.37	*SD* = 3.57				
Affect	*M* = 5.15	*M* = 7.27	*M* = 5.51	20.39	<.001	.17	FtF<CMC*** VR<CMC*** FtF=VR
	SD = 1.44	*SD* = 2.34	*SD* = 2.17				
Social processes	*M* = 11.27	*M* = 10.16	*M* = 11.28	3.29	.039	.03	FtF=CMC VR=CMC FtF=VR
	SD = 2.98	*SD* = 2.51	*SD* = 3.01				
Cognitive processes	*M* = 18.94	*M* = 18.92	*M* = 19.20	.17	.841	< .01	-
	SD = 2.60	*SD* = 3.41	*SD* = 2.98				
Drives	*M* = 5.47	*M* = 8.23	*M* = 5.83	37.20	<.001	.28	FtF<CMC*** VR<CMC*** FtF=VR
	SD = 1.75	*SD* = 2.27	*SD* = 1.89				
Informal	*M* = 7.46	*M* = 2.31	*M* = 9.10	69.72	<.001	.42	FtF>CMC*** VR>CMC*** FtF<VR*
	SD = 3.77	*SD* = 1.85	*SD* = 4.13				
Analytical	*M* = 6.79	*M* = 30.49	*M* = 8.77	101.70	<.001	.51	FtF<CMC*** VR<CMC*** FtF=VR
	SD = 5.61	*SD* = 16.36	*SD* = 6.11				

Note. * *p* < .05; ** *p* < .01; *** *p* < .001. *M* = mean; *SD* = standard deviation.

7.3.5.2.2 *Linguistic differences for persuasion*. Next, LIWC categories for the persuasion sub-groups (persuaded or not) were analysed across the entire data sample, irrespective of environmental modality. This revealed a significant multivariate effect, Box's $M < .01$, Pillai's trace $= 1.00$, $F(10, 186) = 8.24$, $p < .001$, $\eta_p^2 = .31$. Follow-up univariate ANOVAs revealed that cognitive processing, $F(1, 195) = 8.84$, $p = .003$, $\eta_p^2 = .04$ (M persuaded $= 19.57$, $SD = 2.86$; M not-persuaded $= 18.31$, $SD = 3.04$), analytical thinking. $F(1, 195) = 16.71$, $p < .001$, $\eta_p^2 = .08$ (M persuaded $= 11.48$, $SD = 13.30$; M not-persuaded $= 19.92$, $SD = 15.65$), drives, $F(1, 195) = 22.93$, $p < .001$, $\eta_p^2 = .10$ (M persuaded $= 5.83$, $SD = 2.14$; M not-persuaded $= 7.34$, $SD = 2.26$), and informal language, $F(1, 195) = 62.98$, $p < .001$, $\eta_p^2 = .24$ (M persuaded $= 8.28$, $SD = 4.32$; M not-persuaded $= 3.85$, $SD = 3.23$) contributed to this effect. This indicates that mock-jurors who were persuaded produced a larger amount of cognitive processes and informal language in their linguistic style. Likewise, non-persuaded mock-jurors had greater percentages of analytical thinking and instances of drives, such as achievements, power and risk overall in their speech compared to persuaded mock-jurors.

7.3.5.2.3 *Linguistic differences broken down by gender and ethnicity*. Previous chapters have broken gender and ethnicity down to investigate any differences or similarities in linguistic style within each study and each level of the factors (males, females, British and South-Asian). However, this chapter serves to bring these statistics into one large database, thus allowing a further breakdown of these factors regardless of environmental modalities. Therefore, a 2 (Gender: male v. female) x 2 (Ethnicity: British v. South-Asian) between factor MANOVA was conducted on the inclusive ten categories of LIWC. This resulted in a significant main effect of Ethnicity, Wilks's $\Lambda = .73$, $F(10, 184) = 6.82$, $p < .001$, $\eta_p^2 = 27$. Subsequent univariate ANOVAs (adjusting for Bonferroni's

correction) revealed that clout, $F(1, 193) = 10.52$, $p = .001$, $\eta_p^2 = .05$ (M British = 42.85,

$SD = 16.81$; M South-Asian = 51.21, $SD = 19.24$), affective, $F(1, 193) = 18.542$, $p < .001$,

$\eta_p^2 = .09$ (M British = 5.30, $SD = 1.83$; M South-Asian = 6.61, $SD = 2.37$), and social

processes $F(1, 193) = 23.39$, $p < .001$, $\eta_p^2 = .11$ (M British = 9.97, $SD = 2.26$; M South-Asian

= 11.84, $SD = 3.12$), were significantly different across the ethnic groups. The multivariate

effect of gender was non-significant Wilks's $\Lambda = .94$, $F(10, 184) = 1.08$, $p = .383$, likewise

the ethnicity x gender interaction was non-significant, Wilks's $\Lambda = .95$, $F(10, 184) = 1.00$,

$p = .442$.

      7.3.5.2.4 *Linguistic differences for cognitive style.* Exploratory analyses regarding

the two cognitive style measures were undertaken. A 2 (NfCC: high v. low) x 2 (PDI-R:

high v. low) between-factor MANOVA was utilised for cognitive style across the ten

LIWC categories, which revealed non-significant multivariate effects for delusional

thinking, Wilks's $\Lambda = .82$, $F(10, 38) = .84$, $p = .589$, NfCC, Wilks's $\Lambda = .69$, $F(10, 38) =$

1.71, $p = .113$, and the PDI-R x NfCC interaction, Wilks's $\Lambda = .66$, $F(10, 38) = 1.98$, $p =$

$.063$.

      7.3.5.3 *Linguistic style matching (LSM).* To examine whether there are any

differences in the mean total LSM scores across the three studies, a univariate ANOVA

was conducted. Initial observation of the means indicate higher LSM in the FtF

environmental modality ($M = .88$, $SD = .05$) compared to the CMC ($M = .84$, $SD = .06$)

and VR conditions ($M = .85$, $SD = .06$). This was confirmed in the inferential analysis, F

$(2, 194) = 8.49$, $p < .001$, $\eta_p^2 = .08$, 95% CI (.85, .87). Tukey post-hoc comparisons showed

significant mean differences between the FtF modality and the other two studies, CMC (p

$< .001$) and VR ($p = .031$). CMC and VR has similar mean LSM scores ($p = .265$). This

indicates that FtF discussions have significantly more linguistic synchronicity compared to

discussions via online transmission.

Looking at persuasion across all three studies, the univariate ANOVA revealed non-significant differences, $F(1, 195) = 2.57$, $p = .110$, $\eta_p^2 = .01$, supporting previous chapters showing little differences in LSM for the persuaded versus not-persuaded mock-jurors. Further, to collate the entirety of the current data and investigate ethnicity and gender interactions, a 2 x 2 ANOVA was conducted. This revealed non-significant main effects for gender, $F(1, 193) = .71$, $p = .401$, $\eta_p^2 < .01$, and ethnicity, $F(1, 193) = .22$, $p = .636$, $\eta_p^2 < .01$. The interaction for ethnicity and gender was also non-significant, $F(1, 193) = .03$, $p = .851$, $\eta_p^2 < .01$ revealing no differences in linguistic similarity across males, females, British and South-Asian mock-juror groups.

7.3.5.3.1 *LSM over time.* A 2 (Persuasion: persuaded vs. not-persuaded) x 3 (Study: FtF vs. CMC vs. VR) x 4 (Time: 1 vs. 2 vs. 3 vs. 4) mixed-factor ANOVA was conducted for the four quartiles of each discussion, with the total LSM score as the dependent variable. This revealed a non-significant main effect for time, $F(3, 573) = .15$, $p = .929$. The two-way interactions consisting of Time x study, $F(6, 573) = .59$, $p = .742$, and time x persuasion, $F(3, 573) = .33$, $p = .806$, were also not significant. Finally, the inferential analysis revealed a significant three-way interaction, $F(6, 573) = 2.35$, $p = .030$, $\eta_p^2 = .02$. This interaction has a very small effect size and thus any inferences from this three-way interaction should be made with caution.

7.3.5.4 *Epistemic modality.* The degree of confidence (measured as either high or low) in the verdict proposed by mock-jurors is measured through linguistic style via LIWC analysis (epistemic modality). To investigate the effects of status, persuasion and study, a 2 (Status: participant vs. confederate) x 2 (Persuasion: persuaded vs. not-persuaded) x 3 (Study: FtF vs. CMC vs. VR) MANOVA was conducted for high and low epistemic modality, which revealed a violation of equal covariates (Box's $M < .05$). There were

significant main effects for Persuasion, Pillai's trace = .02, F (2, 381) = 4.62, p = .010, η_p^2 = .02, and Study, Pillai's trace = .09, F (4, 764) = 8.85, p < .001, η_p^2 = .04. Status produced a non-significant multivariate main effect, Pillai's trace <.01, F (2, 381) = .40, p = .671. Further, there were statistically significant interactions for status x persuasion, Pillai's trace = .03, F (2, 381) = 5.29, p <. 01, η_p^2 = .03, and persuasion x study, Pillai's trace =.03, F (4, 764) = 2.55, p = .038, η_p^2 = .01. Status x study, Pillai's trace <.01, F (4, 765) = .62, p = .648, and the three-way interaction were both non-significant, Pillai's trace <.01, F (4, 764) = .85, p = .493.

Follow-up univariate ANOVAs revealed persuasion had a significant influence on low epistemic modality, F (1, 382) = 9.14, p = .003, η_p^2 = .02, whereby those who were persuaded to change their opinion had a higher percentage of low-confidence words in their speech (M = 3.10, SD = 1.50) than the mock-jurors who resisted persuasion (M = 2.11, SD = 1.14). High confidence in speech did not contribute to the significant main effect for persuasion (p > .05).

Univariate ANOVAs for study revealed significant differences for both low, F (2, 382) = 13.28, p < .001, η_p^2 = .06, and high confidence in speech, F (2, 382) = 4.30, p = .014, η_p^2 = .02. Post-hoc Tukey multiple comparisons revealed significant mean differences for the FtF and VR studies when compared to the CMC condition (see Table 7.7). The CMC condition had a significantly reduced percentage of low (M = 2.06, SD = 1.21) and high confidence (M = 3.80, SD = 1.17) words during the discussion compared to both the FtF (M low-conf = 2.86, SD = 1.48; M high-conf = 4.54, SD = 1.30) and VR environments (M low-conf = 3.06, SD = 1.42; M high-conf = 4.47, SD = 1.57).

Table 7.6

Tukey HSD comparisons for environmental studies across the two dependent variables for

epistemic modality

Dependent variable	Comparisons	Mean Difference	Std. Error	95% CI Lower Bound	95% CI Upper Bound
Low confidence	FtF v CMC	.80**	.23	.25	1.36
	CMC v VR	-1.00***	.23	-1.55	-.45
	FtF v VR	-.20	.23	-.75	1.36
High confidence	FtF v CMC	.74**	.24	.18	1.30
	CMC v VR	-.67*	.24	-1.23	-.12
	FtF v VR	.07	.23	-.49	.62

Note. *$p < .05$, **$p < .01$, ***$p < .001$

Finally, the between-subjects comparisons revealed that the status x persuasion interaction influenced low confidence, $F (2, 382) = 8.90$, $p = .014$, $\eta_p^2 = .02$. The means indicate that persuasion influences this interaction rather than status, with the persuaded mock-juror having a higher percentage of low confidence in speech than the not-persuaded mock-juror, and no differences occurring across the status conditions. All remaining univariate ANOVAs for the main effect and interactions contained within this MANOVA did not significantly differ (all p's > .05).

To understand the interaction between gender and ethnicity for epistemic modality, a 2 x 2 MANOVA was additionally computed. However, the multivariate results indicate that neither gender, $F (2, 192) = 2.28$, $p = .105$, nor ethnicity $F (2, 192) = .37$, $p = .690$, significantly influenced epistemic modality. Further, the interaction between these two independent variables was non-significant, $F (2, 192) = 1.63$, $p = .198$.

7.3.6 Qualitative content analysis (QCA). This section brings together the existing descriptives contained within the three studies that make up this thesis; collating and exploring the sum of the qualitative data to allow variables (cognitive style, persuasion, gender and ethnicity) to be analysed for all three modalities. A total of 2,758

QCA codes were analysed for the 197 participants, and it is this data which is summarised below. As this sub-section is an inclusion of the existing analyses contained within Chapters 4 to 6, the QCA themes will be merged and commented on with regards to pre- and post-discussion sections only (see Appendix M4).

       7.3.6.1 *Pre-discussion*. Overall, 32.5% of mock-jurors expanded on the prosecution's argument compared to half of this number expanding on the defence's arguments (16.2%). This pattern continued when comparing the persuaded and not-persuaded groups indicating that this bias towards initial focus on the prosecution's argument did not influence persuasion outcomes. Across all three studies, the highest scoring category regarding references to the accused was that of the company only (QCA 502). The pattern of mock-jurors falling into Theme 2 did not vary across the persuaded and not-persuaded groups (46.8%; 46.5% respectively), thus indicating references to the accused in responses prior to the jury discussion was not indicative of persuasion outcomes.

Those who reasoned using the case file evidence only (QCA code 141) and did not expand in anyway were more likely to be persuaded (18%) by the jury discussion (compared to 7% in the not-persuaded sample). Further, double the frequency of South-Asian mock-jurors (18.2%) fell into this code compared to the British sample (8.2%), and low NfCC individuals also relied heavily on background information (15.7%) to much more of an extent than individuals high in the NfCC (4.7%). Perhaps in a bid to explain their reasoning sufficiently enough to counter any rebuttals, individuals high in the NfCC expanded their thought processes, utilising information and evidence that went beyond that of the brief (which is kept deliberately vague as a paradigm) in order to allow a firm decision to be made. In addition, males were twice as likely to fall into QCA code 13 (7.1%) which focussed on analytical reasoning and has an absence of any emotions than the females (3.1%) across all studies.

Regarding attribution of guilt, the frequency to which participants referenced the company/the accused vs. somebody else was nearly 50:50, which held across the persuasion groups. This indicates that initial responses regarding attribution of responsibility is not indicative of persuasion outcomes.

When asked what, if any, facts they ignored when making their initial decision, the highest scoring QCA code was 'background information – QCA code 4' (44.7%). This highlights that the majority of participants read the scenario closely, focussing on the evidence provided and the arguments made by opposing counsels rather than the background information which set the scenario into context and thus failed to provide evidence towards the charge of negligence. Further, when asked why they had ignored this information, 28.9% stated the information was not important or relevant to their decision. British mock-jurors were more likely to reason analytically when explaining why they had ignored certain evidence, as were the males when compared to their opposing sample groups.

7.3.6.2 *Post-discussion*. As with the pre-discussion, the highest scoring category in Theme 1 was expansion on the prosecution's argument (27.4%), with very similar frequency counts across all levels of the variables (ethnicity, gender, cognitive style and persuasion). Interestingly, those who were not persuaded quoted an absence of evidence to a higher degree (25.6%) than those who were persuaded (12.6%).

8.1% of the not-persuaded mock-jurors referenced background information as the primary reason for their final decision, the same statistic as the pre-discussion responses indicting little change in their reasoning and thus not changing their verdict choice. Just, 0.9% (*n*=1) of the persuaded sample mentioned background information as a reason for changing their verdict in the post-discussion (compared to 13.5% at the pre-discussion).

The fact that a person was being charged (the managing director) seemed to be an important factor in the decision making of British and female samples, with almost double the frequency of respondents falling into QCA code 401 than South-Asian and male groups. Additionally, more people noted this as a reason for their change in verdict choice (13.5%) than those who resisted persuasion and stuck with their initial decision (8.1%; be it guilty or not guilty).

Theme 2 had a pretty even split regarding references to the accused, referring to the company (32.5%), the individual (32.0%) or both (28.4%). This even pattern follows across persuasion and other variable groups with no clear differences across the samples. Theme 3 on the other hand, revealed differences between the persuasion groups. More people referenced moral reasons as their motivation to change their opinion (10.8%) compared to just one person in the non-persuaded group (1.2%). Due to the confederates following a set script and points made not differing across the confederate mock-jurors, this does not simply mean that mock-jurors were more likely to be persuaded if they were presented with a moral argument. Rather, mock-jurors with a predisposition to change their opinion were more likely to be persuaded when moral reasoning was presented and discussed whereas the not-persuaded mock-jurors do to mention any moral reasoning when justifying their verdict choices. Males were less likely to use moral reasoning in their verdict choice statements (2%), whereas 11.2% of the female sample ($n = 11$) fell into the QCA category.

QCA code 142 highlights mock-jurors' reasoning for primarily choosing not guilty due to expansion of the defence's argument, and thinking about the scenario in a different, more holistic way. Nearly a third of persuaded mock-jurors utilised this reasoning in their statements (27%) compared to just 9.3% of mock-jurors who were not-persuaded. This does not seem to be due to it being 'easier' to persuade someone to change from guilty to not guilty, as there is a relatively even split regarding guilty reasoning (QCA codes 9 and

10) across the persuaded and not-persuaded groups. Perhaps then, expanding on the evidence provided not only in the defence's statement, but also on the background information to bolster your argument was more productive at changing mock-jurors' opinions.

British mock-jurors had a much higher percentage of individuals stating that they were not persuaded due to a lack of evidence strength (13.3%) compared to the South-Asian participants (3%), who were more likely to simply state they were not persuaded and not expand on their statements. Of those who were not persuaded to change their mind however, a large proportion (33.7%) conceded that despite not being persuaded, the confederate did say some persuasive points. Of those who were persuaded, their main reasoning surrounded the fact that they felt the confederate mock-juror challenged their point of view and highlighted areas of the evidence or scenario which they had not thought about/missed out initially (58.6%). Thus, over half of the persuaded mock-jurors conceded that the confederate was successful in changing their opinion and did so by successfully challenging their initial point of view using reasoned arguments.

More persuaded mock-jurors (20.7%) stated communication was balanced and fair than the not-persuaded mock jurors (5.8%). Perhaps not surprisingly, the non-persuaded mock-jurors had higher rates in the 'negative QCA categories', with 15.1% stating they thought the communication was rigid (compared to 6.3% of persuaded mock-jurors).

7.3.6.3 *QCA comparing the three environmental modalities.* This paragraph serves as an ephemeral summary of the key themes under which the three environmental modalities differ/are comparable. Of interest here are the responses to the post-discussion questionnaires following environmental exposure; of particular relevance are the responses regarding how persuasive the mock-jurors found the confederates.

The majority of mock-jurors who stated they were not persuaded due to the evidence not being strong enough (QCA code 152) were in the CMC condition (14.1%, $n = 9$), with a much lower frequency appearing in the FtF (4.5%, $n = 3$) and VR (6%, $n = 4$) settings. This is despite the evidence being exactly the same across all three studies, indicting that exposure to arguments in an anonymous instant messaging context appeared to be perceived as weaker compared to the FtF and VR conditions.

Assessment of the communication during the jury discussions reveal that the CMC modality had a higher frequency for QCA code 24, specifying that participants felt the communication was rigid and argumentative (17.2%, $n = 11$). The FtF condition received 9.1% ($n = 6$) in this category whereas the VR environment had the least complaints regarding rigid conversations, at 4.5% ($n = 3$). In fact, the VR condition received very little negative comments on the communication interactions, with over half of the sample (52.2%, $n = 35$) quoting that the communication was friendly, pleasant and easy.

7.3.7 Confederate ratings. Confederate ratings were taken across all three studies, which asked for the mock-jurors to assess how 'friendly' and 'aggressive' they perceived their communication partner to be during the discussion. Gender, persuasion and ethnicity were compared to better understand whether defined differences affected the outcome of these subjective ratings. Mann-Whitney U tests revealed non-significant effects for Gender when reporting on Friendliness $U = 4345.00$, $p = .186$, $r = .09$, and Aggressiveness $U = 4696.50$, $p = .667$, $r = .03$, of the confederate mock-juror. Ethnicity ratings of Friendliness was also non-significant, $U = 4778.00$, $p = .848$, $r = .01$. However, ratings of aggressiveness varied between the sample groups for ethnicity, $U = 4058.50$, $p = .027$, $r = .16$, with South-Asian mock-jurors rating their fellow south-asian confederate as more passive ($Mdn = 3$; $mean\ rank = 107.01$) than the British sample rating the British confederates ($Mdn = 3$; $mean\ rank = 90.91$).

Persuasion was significant for ratings of friendliness, $U = 3538.50$, $p = .001$, $r =$ .23. The descriptive statistics show persuaded mock-jurors rated their confederate as friendlier on average ($Mdn = 4.0$; *mean rank* = 110.12) than those who resisted persuasion ($Mdn = 4.0$; *mean rank* = 84.65). Ratings of aggressiveness was close to significant, $U = 4080.00$, $p = .052$, $r = .14$, with analysis of the mean ranks indicating the persuaded mock-jurors perceived their confederate as being more passive than the not-persuaded mock-jurors (*mean rank* = 105.24; $Mdn = 3.0$; *mean rank for not-persuaded group* = 90.94, $Mdn = 3.0$).

The Kruskal-Wallis H test is a rank-based non-parametric alternative to a one-way ANOVA, and an extension of Mann-Whitney U which allows for the comparisons of more than two groups. This was conducted to compare confederate mock-juror ratings of friendliness and aggressiveness across all three environmental modalities. Subjective ratings of aggressiveness were significantly affected by environmental modality, $H(2) = 8.15$, $p = .017$. Pairwise comparisons used adjusted p-values controlling for Type I error (see Table 7.8 for descriptive statistics) showed a significant difference between the CMC and FtF study for ratings of confederate aggressiveness (*Adj. p* = .041, $r = .22$), as well as the CMC study and VR study (*Adj. p* = .038, $r = .22$). There were no significant differences in aggressiveness ratings for the FtF and VR studies (*Adj. p* = 1.00, $r < .001$), indicating very similar mean ranks for aggressiveness across these two studies.

Table 7.7

Descriptive statistics for ratings of aggressiveness of confederate mock-jurors across all three studies

Study	N	Mean Rank
FtF	66	106.13
CMC	64	83.98
VR	67	106.32

Ratings of how friendly the mock-jurors found the confederate mock-juror across
the three studies also revealed a significant result, $H(2) = 31.400, p < .001$. Pairwise
comparisons among the three groups with adjusted *p*-values revealed significant
differences in friendliness ratings for the CMC vs FtF studies (*Adj. p* $< .001, r = .47$), as
well as the CMC vs VR studies (*Adj. p* $< .001, r = .36$). The difference in the mean ranks
for the FtF v VR studies was not significantly different (*Adj. p* $= .661, r = .11$). Table 7.9
presents the mean ranks for all three studies, revealing that the CMC modality has
significantly lower friendliness ratings for the jury discussion than the FtF and VR studies.

Table 7.8

Descriptive statistics for ratings of friendliness of confederate mock-juror across all three
studies

Study	*N*	Mean Rank
FtF	66	119.55
CMC	64	68.42
VR	67	107.97

Note. A higher ranking indicates a confederate being more friendly than unfriendly.

7.3.7.1 *Confederate word count.* To understand whether there were any
extraneous differences in word count across the confederate mock-jurors, a univariate
ANOVA was conducted, containing 4 levels of the manipulated IV (British male, British
female, South-Asian male, South-Asian female). Due to Levene's statistic being significant
($p < .001$), Welch's *F* was adopted. This showed a non-significant difference in word count

for the four confederate mock-juror categories, *Welch's F* (3, 103.81) = 1.91, *p* = .133, demonstrating that across gender and ethnic divides, different confederate mock-jurors did not differ for the number of words spoken/written during the jury discussions.

7.3.8   Summary of results. Looking across all three studies, the distribution for persuaded to not-persuaded differs from males to females, with more females showing a persuaded outcome whilst males have a much more even ratio of dispersion. When comparing persuasion across studies, Study 1 (FtF) had a very similar number of mock-jurors persuaded (69.7%) to Study 3 (VR; 65.7%) whereas Study 2 (CMC) shows a complete reversal of this effect in that the number of people persuaded in the other two studies matched the number *not* persuaded in the CMC modality (67.2%). This indicates that the novel VR is as successful at inducing persuasion as FtF conversations whereas CMC seemingly contributes to the resistance of the same persuasive messages.

To investigate whether a verdict of guilty or not guilty was easier to obtain give the evidence provided, a chi-square test highlighted that a choice of either verdict does not significantly affect persuasion outcomes, and the varying differences in changing from one verdict to another is not considered easier or harder to induce a change in opinion - the findings for persuasion across the three studies cannot be attributed to the strength of evidence provided in the case summary.

Across both time points (pre and post-discussion) confidence in verdict was found to significantly differ between persuaded and not-persuaded groups. Overall, those who were persuaded to change their verdict had lower confidence in their initial *and* final verdict compared to those who resisted persuasion. Despite a non-significant interaction, the graph depicting confidence in verdict at Time 2 for the three studies, split by persuasion (see figure 7.3), indicates that confidence post-CMC interaction has a large difference when comparing persuaded and not-persuaded verdicts. However, the FtF and

VR show an overlap in their findings, reflecting similarities regarding percentage confidence in verdict post-discussion.

To compare the change in confidence from time 1 to time 2, absolute confidence change was calculated. Once again, this revealed similarities for the FtF and VR studies, with both showing a 32% change in confidence regardless of verdict outcomes. This is compared to just 18% for the CMC study, with findings from Study 2 indicating this low change in confidence being due to a significant number of mock-jurors not being persuaded. Analysis of absolute confidence direction further revealed that the CMC study had a high proportion of mock-jurors who did not change their confidence post-discussion.

Persuasion showed the biggest change in confidence, with those who were persuaded changing their confidence by 40% (in an upwards direction), whereas not-persuaded mock-jurors had an average change of just 12% due to the majority of mock-jurors not changing their confidence across the time frames. Differences for persuaded mock-jurors across the studies regarding absolute confidence change was significant but the not persuaded changes in confidence did not significantly differ across the three studies.

Cognitive style across all studies did not have a relationship between the two measures, which was confirmed when analysing the larger data set. With a larger data set available, mock-jurors who were high or low in the two cognitive style measures revealed non-significant findings for all but ethnicity and delusional thinking. The finding showing that South-Asian mock-jurors were more likely to score high in PDI-R than British mock-jurors, and the reverse was true for those low in PDI-R.

The time taken to discuss the jury paradigm and come to a conclusion, be that unanimous or not, revealed similar findings for FtF and VR studies, with the VR study having a slighter quicker discussion duration (08:26 mins) than FtF (10:46 mins). However, the CMC study which required mock-jurors to write their thoughts rather than

259

verbalise them had a significantly longer duration of discussion (on average lasting for 27:16 mins) and this significantly differed for both FtF and VR datasets. Despite CMC having the largest duration, it had the lowest word count of all the studies (mean of 350) whilst FtF had the largest contribution from mock-jurors (1010, and VR having an average word count of 732). It shows how mock-jurors contribute much more to the discussion when conversing FtF with their jury partner, and this contribution to word count decreases as the modalities become restricted; with a lower word count for VR and a significantly lower contribution when responses are anonymous and written using CMC.

Overall, persuasion outcomes followed the findings from the previous three studies in that persuaded interactions were significantly shorter (09:52 mins) than interactions which failed to reach a unanimous conclusion (22:24 mins). Cognitive style and ethnicity were similar in their duration of discussion times and word count responses across all three studies. The word count for gender highlights that across all three studies males spoke/wrote more on average than females, despite their duration of discussion not differing across the groups. Confederate mock-jurors and mock-jurors were evenly split on word count, with no significant differences across the persuaded groups for all three studies. This indicates that findings cannot be attributed to differences in confederates, even when persuasion and study are included in the analysis.

A higher degree of affective language, drives and analytical thinking emerged in the CMC modality compared to FtF and VR environmental conditions. Specifically, almost a third of the discussion in the CMC was made up of analytical thinking language, compared to under 10% for the VR and FtF studies. Additionally, there was less informal language during the anonymous CMC condition. Here, the VR modality rated the highest for informal language use, followed closely by the FtF study. Finally, the FtF modality had significantly higher usage of function words than the CMC and VR environments, which did not differ for the linguistic sub-theme.

Persuaded mock-jurors had a higher percentage of cognitive processing and informal language in their speech, but significantly lower ratings of analytical thinking and drives (outlining achievements, power and risk) compared to the not-persuaded sample. British females, South-Asian males and South-Asian females displayed similarities in linguistic style across all ten linguistic sub-themes. Similarly, cognitive style revealed no significant difference for the ten linguistic sub-themes for mock-jurors either high or low in NfCC and PDI-R. However, ethnic differences emerged whereby South-Asian participants used more clout, affective and social processing in their discussions than British mock-jurors. However small effect sizes emerged for the majority of the LIWC findings for ethnicity.

LSM showed how the FtF modality had a higher rate of synchronicity for mock-jurors interacting with their confederate compared to both the VR and CMC environments, both of which are considered leaner in media richness. Ethnicity, gender and persuasion produced similar scores for LSM across the groups. When the duration of discussions were split into quartiles and LSM was measured within each of these segments, LSM did not differ for environmental modality or persuasion as the conversations progressed.

Participants who were persuaded to change their opinion had a higher percentage of low-confident words (more doubt) in their speech than the mock-jurors who resisted persuasion. However, high confidence in speech did not contribute to the significant main effect for persuasion. When comparing the three studies, epistemic modality revealed how the CMC environment produced significantly lower rates of low and high confidence in speech when compared to both FtF and VR studies. The FtF and VR studies did not differ in ratings of expressed confidence in speech.

The qualitative content analysis combining all data from the three studies shows how more mock-jurors expanded on the prosecution's argument when rationalisng their initial verdict choice than those who expanded on the defence's. Individual's reasoning

261

based on the case file evidence meant that they were more likely to be persuaded - they had not expanded their reasoning outside of the case summary and so were more likely to be introduced to new and novel arguments (nearly 60% of persuaded mock-jurors stating they were persuaded due to the confederate highlighting evidence they had not considered or missed). Males were twice as likely to reason analytically and have an absence of emotions when explaining their initial verdict compared to their female counterparts.

Concession to the fact that the company is partly responsible but not entirely to blame was more prevalent in persuaded mock-juror statements (10.8% vs 4.7% not-persuaded. Perhaps a compromise enables an ease to change verdict choice and thus reason a half-way arrangement in the post-discussion questionnaire. Of those not persuaded, a high number conceded that the confederate said some persuasive points despite this not altering their decision. Likewise, both persuaded and not-persuaded individuals commented equally on the discussion being friendly and pleasant.

Mock-jurors who commented that the evidence provided was not strong enough primarily came from mock-jurors interacting in the CMC environment despite evidence being universal across the studies. This implies that evidence and arguments in a restricted and lean modality such as CMC is perceived to be weaker than when these same arguments are presented in either VR or FtF. Furthermore, participants were more likely to comment that the discussion was rigid and argumentative when interacting in a written, anonymous format (Study 2).

When ratings of the confederate mock-jurors were taken from across all three studies, it revealed that persuaded participants were more likely to rate their confederate as friendlier and less aggressive (ie, more passive) than mock-jurors who were not persuaded. Both the VR and FtF modalities produced similar rankings for aggressiveness ratings in that mock-jurors within these two studies perceived the confederate as more passive. The CMC environment however was significantly lower on this ranking highlighting how

mock-jurors perceived their anonymous partner to be more aggressive in this medium than either of the FtF or VR participants. This finding was further replicated for ratings of friendliness: CMC mock-juror ratings show significantly lower friendliness scores than the VR and FtF studies, who themselves scored similarly, with high mean ranks indicating a friendliness perception of their confederate discussion partners.

7.4 Discussion

This thesis sought to investigate persuasion within differing environmental modalities by employing a modernised version of the jury paradigm across three contexts (FtF, synchronous CMC, and immersive VR). Furthermore, it aimed to examine the impact of cognitive style, gender and ethnicity on the persuasion process. Finally, language was investigated to understand the impact, or otherwise, of linguistic style, linguistic synchronicity and epistemic modality on persuasion outcomes, in addition to gaining an understanding of the linguistic relationship across cognitive style, gender and ethnic measures. The results of each empirical chapter have been reported in full in the relevant sections of this thesis. Therefore, it is not the intention to reiterate what has already been stated. Rather, this discussion concerns itself with the primary findings emerging from the above reported analyses of relevance to the overarching aims.

The primary findings to emerge from this final comparison analyses were, i) persuasion outcomes in VR contexts mirrored that of FtF, but persuasion in CMC was significantly reduced, ii) overall, non-persuaded participants were more confident in their verdict choices pre-discussion, and their confidence levels remained stable post-discussion. Persuaded participants were less confident with their pre-discussion choice, but their confidence increased substantially despite having changed their initial verdict, iii) overall, ethnicity and gender had no impact on persuasion outcomes, iv) cognitive style as measured using the NfCC and PDI-R did not mediate nor predict persuasion outcomes, and

v), persuaded participants displayed enhanced cognitive processing and informal language, but lower rates of analytical reasoning compared to non-persuaded participants. Each of these primary findings are now discussed in turn.

      7.4.1 Persuasion. As noted above, the VRE produced similar outcomes for persuasion as the FtF modality. Yet the anonymous CMC context revealed the reverse in that mock-jurors, on average, were more likely to resist persuasion attempts. This is in line with previous research finding fewer opinion changes in chat-based CMC than FtF (Di Blasio & Milani, 2008). Wilson (2003) also found that CMC was substantially less effective than FtF for both achieving persuasion and applying persuasive strategies. Additionally, CMC has been found to be less effective in a variety of negotiation, choice, and execution tasks (Wilson & Morrison, 2000), advocating that the act of interactive communication using a lean digital modality hampers successful communication and makes tasks much more difficult to accomplish.

      This supports the HSM predictions made in Table 1.1, where richer mediums (FtF) enable multi-channel processing, promoting the utilisation of both heuristic and systematic arguments in their decision-making. If complementary, these multiple cues have an addictive affect and can enhance one's processing of the persuasive argument (successful persuasive outcome). CMC on the other hand restricts the ability to utilise multi-channel processing by restricting heuristic cues (such as non-verbal behaviour, paralinguistic cues, utilisation of stereotypical variables). This enhances cognitive load for participants, requiring them to process the arguments systematically, negatively biasing persuasion outcomes given that the default position of the HSM is the principle of least cognitive effort.

      Furthermore, these findings support the Media Richness theory (MRT: Daft & Lengel, 1986) whereby textual communication constrains transmission of non-verbal and

paralinguistic cues, in turn negatively impacting on decision-making and the process of communication (Hammick & Lee, 2014; McGrath & Hollingshead, 1993). The impoverished modality confines an individual's ability to translate and interpret social and contextual cues (Muscanell, 2009), breaking down the interaction to simple written text. This diminishes the ability to signal an interruption or clarify a given point, making the interaction during the CMC modality disjointed and detached compared to FtF and VR (Jensen et al., 1999; Straus & McGrath, 1994). The low persuasion result within the CMC medium possibly reflects difficulties in interrupting or clarifying judgments. This is supported by the qualitative analysis, with participants commenting that they perceived the discussion as more rigid and argumentative. Individuals also remarked that persuasive arguments were not considered strong enough to change their mind, despite these same arguments being used across all three modalities to greater effect. It suggests that participants' processing was biased by the lack of available cues and the increase in cognitive effort needed given the difficulties the CMC environment has in conveying and transmitting persuasive messages, and thus the arguments that do get aired are considered weaker as a result (see Patterson, 1982).

Despite Study 2 being a socially lean modality, it does allow for synchronous communication and has the ability to convey emotions (via emojis). Yet despite this advancement towards a more 'naturalistic' (akin to direct and instant messaging services popularly used) and instant way to communicate online, this research has shown that text-based chats continue to restrain effective and persuasive communication. For example, being able to transfer sarcasm. Hence, despite Study 2 advancing the persuasion paradigms previously employed by increasing the 'richness' of CMC (see Baltes et al., 2002), at its heart is a modality which remains anonymous and lacks visual and auditory cues, instead relying on the transmission of typed messages.

Writing increases cognitive load, requiring simultaneous or rapid switching between a variety of processes (see Torrance & Galbraith, 2006). For example, the time taken to receive and read the information, time taken to formulate a response while attempting to avoid spelling mistakes, the speed to which thought processes run in parallel to typing ability, responding to the appropriate responses when multiple chunks of conversation filter through, and keeping concentration levels high. In FtF, on the other hand, when waiting to respond, the other communication partner verbalises their opinions whilst the receiver listens, processes, retrieves and relates to existing thoughts, whilst subconsciously monitoring and imitating body language etc. For example, the listener can utilise both routes for the HSM, enabling them to co-occur and create additive effects were appropriate. In CMC, however, it takes time to type and respond, leaving the recipient in a state of limbo given the restriction of peripheral cues. This is reflected in the duration differences across the modalities. Participants in Study 2 took nearly three times as long to reach a decision than the FtF and VR contexts yet reported significantly fewer linguistic responses. The time difference in achieving tasks within synchronous text-based mediums vs FtF contexts has been consistently reported within the literature, in addition to CMC's prevalence for fewer comments and reduced effectiveness (see Baltes et al., 2002).

The VRE constructed in this thesis on the other hand, was richer in its ability to transmit cues than other forms of digital modalities (for example, Study 2) because it supported real-time audio chat and interactive, immersive visual perception of their communication partner. Both FtF and the VR interactions benefit from simultaneous feedback and exchange of verbal and non-verbal cues to emphasise the message and opinions of the speaker. For example, openly showing agreement and understanding via nodding of the head. Interestingly, Jensen et al. (1999) found that voice conditions result in higher levels of cooperation compared to text-based chat modalities. This could be due to the enhanced level of social proximity and immediacy felt in FtF and VRE conditions and

266

the ability for the two processing routes of the HSM to co-occur. The findings also serve to replicate Xu and Behring's (2014) findings, who measured persuasion in a similar manner to the current research, finding that audio chat led to enhanced persuasion and consensus in a survival-rank task compared to when participants used a text-based chat.

Dual-process models of persuasion serve to provide a framework of understanding persuasion within interactive, social settings. Media-rich environments such as the FtF modality, and to a lesser extent the VRE, allow heuristic and paralinguistic cues to be received and processed as part of the decision-making process (see Khan & Sutcliffe, 2013). Di Blasio and Milani (2008), Guadagno and Cialdini (2002), and Petty and Cacioppo (1986a) amongst others reason that the FtF environment is rich in contextual, non-verbal, and relational stimuli, all of which combine to distract attention away from careful consideration of the message content, leading more participants to engage in automatic processing of the persuasive message. This requires less focus and motivation on behalf of the participant, who can utilise a variety of cues and implicit biases to inform their decision-making, such as in-group favouritism (Tajfel & Turner, 1979; Zhang, Lowry, Zhou, & Fu, 2007) and source attractiveness (DeBono & Harnish, 1988; Nisbett & Wilson, 1977). Social influence is perceived to be easier in such contexts. Indeed, the current results add credence to the notion that FtF interactions elicit higher levels of persuasion than mediums which serve to restrict these cues (e.g., Study 2).

CMC is far more task-orientated than FtF, given that this lean and anonymous medium is arguably less influenced by emotions, paralinguistic cues, body language or visual stereotypes. Thus, subjects are more likely to reflect and focus on the content of the message itself, processing the information systematically. If indeed the CMC context promotes the processing of information in a systematic manner as implied in previous research, the current findings which highlight reduced persuasion outcomes in Study 2, could imply that either a), the arguments created in the jury method scenario and

confederate's script did not stand up to scrutiny or b), mock-jurors did not have the ability to exert high levels of mental effort, and were not motivated to think in a critical manner (Petty, Cacioppo & Goldman, 1981).

We reason that Option A is unlikely to hold given that the jury paradigm remained consistent across all environmental modalities. Despite the argument that FtF and VR modalities foster the peripheral route to persuasion as noted in Chapter 1, the dual-process models to persuasion can interact simultaneously. For example, the bias hypothesis in the HSM states that an ambiguous message (such as the jury method case summary) biases systematic processing in that heuristic cues are stimulated and can override the rational processing of the message and thus be independent to motivation. For instance, being presented by an expert versus a layperson, or communicating in a media-rich modality versus an anonymous and restricted context (see Chaiken & Maheswaran, 1994). Perhaps individuals were unwilling to invest high levels of elaboration in Study 2 given the cognitive effort needed to transcribe their thoughts and arguments in a concise and rapid manner. According to the ELM model, this would indicate that a reduction in elaboration would lead to a bias towards peripheral cues. However, due to the lack of peripheral cues available, scrutiny of the messages conveyed over this medium served to influence persuasion outcomes in a negative manner. It is considered difficult for the central route of processing to be induced. Arguments must be considered compelling, credible and stand-up to scrutiny in order for successful persuasive messages to influence outcomes. The arguments created for this study were not manipulated in this manner and thus it could be argued that when most peripheral cues are removed from an interaction, messages lack influential rigour leading to the reduced persuasion outcomes seen within Study 2.

Not only did the CMC condition restrict the confederate's ability to change mock-jurors' verdicts, but ratings of the confederate in this modality was much more negative compared to the VR and FtF conditions. The notion that non-verbal nuances are expressly

linked to the likability of a conversational partner is not new. Okdie and colleagues (2011) found that communicating via CMC led to enhanced negative impressions due to the restrictions involved in maintaining and developing a conversation. Chaiken and Eagly (1983) claimed that the heuristic route relies on simple rules often ascertained from non-verbal cues (e.g., the communicator's gender or perceived personality) to base their subsequent decisions on. They found that likability of the communication partner was a significant determinant of persuasion within video and audio media - the more salient the non-verbal cues and the more likeable the communicator, the greater the persuasive impact upon individual's verdicts and decisions. As one of Cialdini's six principles (Cialdini, 1984), it has been supported by a number of more recent studies finding a link between the use of expressive non-verbal behaviour and likability within a conversational partner (Ambady et al., 2000; Okdie et al., 2011). This lends itself to the suggestion that CMC may be beneficial to begin a conversation, but it is not effective at facilitating group decisions and transmitting persuasive messages. On the flip side, the more likeable the communicator and the more salient their cues are (greater the ability for multi-channel/ heuristic processing), the greater the persuasive outcomes are likely to be.

Little research has been conducted comparing real world effects to virtual reality environments. Yet, the emergent research has, in the majority, reported effects observed and enacted in a VRE to be parallel to the real-world, indicating that VR facilitates transferable skills, and thus can lead to equivalent, or better real-world performances (Dando & Tranter, 2016; Freeman et al., 2016). This is highlighted in Zanbaka et al.'s (2006) study, finding that cross-gendered interactions resulted in enhanced persuasive outcomes across both modalities, and that virtual speakers were as effective at changing attitudes as real people. Furthermore, Yee, Bailenson, Urbanek, Chang, and Merget (2007) concluded that social norms and behaviour observed inside virtual environments follow the same rules and social norms as those observed in the physical world. Thus, as the findings

here concur, individuals behaving in a similar manner inside VREs to that of known FtF outcomes means that, a) the above research and theories applied to FtF research can by extension, be applied to the VR concept, and b) it becomes possible to examine unique research questions that have not yet been possible to undertake in the real-world.

     7.4.2 Choice confidence. Confidence refers to the expression or feeling of certainty. Verdict confidence was measured in this research in an attempt to analyse and measure the metacognitive aspect of decision certainty. Accordingly, two individuals might reach the same conclusion, but have differing confidence in this same decision or attitude. Yet, the more confidence an individual places in their own thoughts and opinions, the greater its subsequent impact on judgements and behaviour. Supported both when meta-cognitive confidence is measured and manipulated (Briñol & Petty, 2004), it is better known as the self-validation hypothesis (Briñol & Petty, 2009; Petty, Briñol, & Tormala, 2002). This theory provides an understanding to one of the key findings to emerge from this thesis: persuaded individuals were less confident in their initial choice compared to those who resisted. Despite persuaded mock-jurors increasing in confidence once the discussion was over, the confidence levels in this new verdict were still comparatively lower than non-persuaded individuals, who themselves showed little change in certainty for their unwavering verdict choice despite exposure to contradictory arguments. Seemingly, individuals with lower confidence in their thought-processes are predisposed to influence by persuasive messages, despite environmental context. The HSM predicts that this occurred systematically, given that individuals had large differences in their actual and desired confidence, and thus were motivated to achieve an accurate and correct answer to satisfy the sufficiency principle. Epistemic measures of confidence that have been investigated within the realms of decision-making and influence have concluded that greater certainty often leads to greater resistance in persuasion. Indeed, Tormala and Petty

(2004) argue that this primarily occurs when elaboration is high (see ELM in Chapter 1). The results reported here back existing research in this area, with linguistic measures of confidence across all three studies revealing higher percentages of doubt in persuaded interactions; further supporting the concept that subjective confidence in attitudes is a predictive factor in one's susceptibility to persuasion.

However, it should be noted that despite non-persuaded individuals having larger confidence scores both pre- and post-discussion, their subjective confidence did not change when compared across the two time points. In other words, their resistance to the persuasion attempts did not enable individuals to become more certain of their initial verdict choices, seemingly contradicting Tormala and Petty's (2002) pioneering research. However, the authors did note that resistance to persuasive messages perceived to be weak resulted in attitude certainty being unchanged. The arguments created within this research were not designed to manipulate or constrict the credibility and strength of arguments presented. Indeed, the original JM paradigm which this research paradigm is based on (see London et al., 1970a & b), did manipulate arguments in so much that it biased participants viewpoints prior to discussion. Yet it is interesting to note that they found individuals who changed their verdict choice had lower certainty in their post-discussion decision than persuaders. And yet despite persuaded mock-jurors having a reduced certainty in their final verdicts compared to non-persuaded mock-jurors, persuaded individuals had larger confidence change scores.

7.4.2.1 *Modality influence on choice confidence.* There has been little attention paid to the effects of persuasive communication in digital modalities on conviction in decisions. Given the plethora of research into persuasion, and the arguments for the influence of confidence on this process, it seems amiss not to touch upon the findings reported in this thesis on this topic area.

Given that the majority of participants in the CMC condition were not persuaded, this digital modality also showed reduced levels of confidence change compared to the FtF and VR studies, which once again produced equivalent results. This reflects Di Blasio and Milani's (2008) research, where not only were there lower numbers of persuaded participants in a written chat discussion, but the extent of their change was also lower compared to FtF. One argument for the lower absolute confidence observed in the CMC condition could be that more people were not persuaded, and thus tended not to increase their confidence as a result. However, the interaction results between modality and persuasion suggests an alternate explanation (see Figure 7.3). Here, persuasion groups were divided across the modalities to understand the interaction between the two. The findings revealed that those who were persuaded in the FtF and VR conditions has similar rates of confidence change (over 40%). Yet the CMC modality contrasts these two contexts, with a confidence change of almost half this amount for persuaded mock-jurors. It indicates that not only was CMC a modality in which it was harder to persuade, but those who were persuaded to change their verdict were not as confident in this final decision when compared to the richer modalities investigated within the other two studies, ostensibly putting instant messaging interaction at a disadvantage when it comes to its ability to persuade. It seems to suggest that metacognitive confidence influences persuasion outcomes, and this is dependent on environmental context.

7.4.3 Gender and ethnicity. The non-significant finding for gender and persuasion outcomes ($p = .051$) was approaching significance. Figure 7.6 displays the findings for successful persuasion across genders for ease, with lighter shades indicating leaner modalities. It displays findings from across the 3 studies, highlighting how males were consistently below females in their persuadability, yet both genders decreased in the

CMC context; with males being significantly more likely to resist persuasion. When this was broken down further, it became apparent that females were significantly more likely to be persuaded when interacting in a FtF modality, which is in direct contrast to text-based CMC, where females were just below the chance level regarding persuasion (see Figure 7.6).
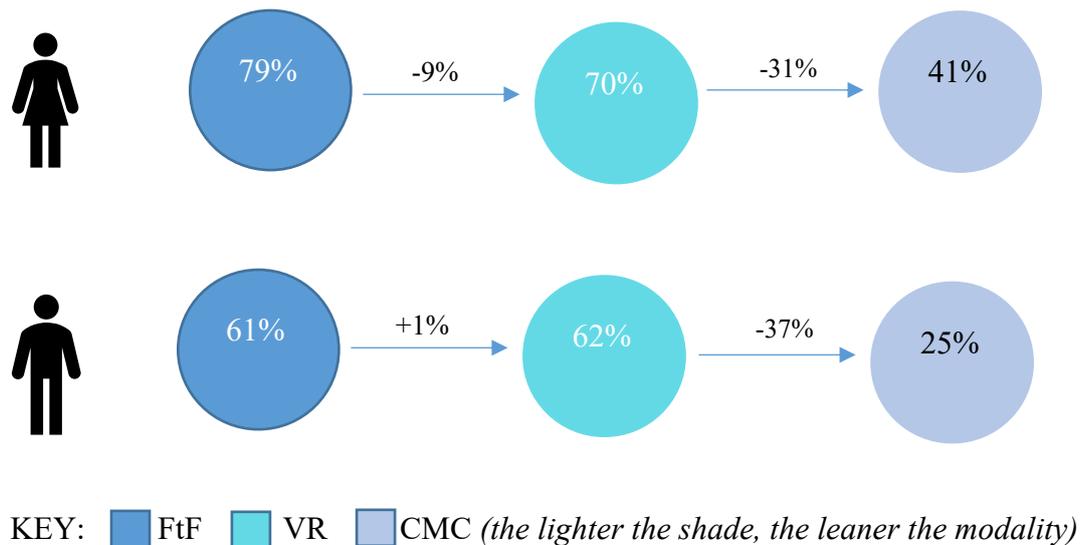
Figure 7.6. Illustrative diagram outlining gender divides for persuadability across three modalities varying in media richness. Percentages represent participants successfully persuaded whilst arrows indicate the difference and direction in persuasion as the modalities become leaner.

This study contributes to the existing literature showing that women perform differently in decision-making tasks when communicating FtF compared to CMC (Dennis, Kinney, & Hung, 1999). Women interacting using text-based online platforms find it difficult to form communal bonds due to the impoverished output which becomes influential on their subsequent persuasion (Guadagno & Cialdini, 2007). As noted in the

diagram above, female persuasion decreases as the modalities become more restricted, supporting the MRT (Daft & Lengel, 1986).

The results presented here also expand on findings from Guadagno and Cialdini (2002; 2007), who examined same-sex dyadic persuasion. They found females were highly sensitive to non-verbal cues, producing higher agreement in the FtF condition compared to CMC. The authors explain this finding in terms of the social roles theory, stating females produce higher agreement rates due to the FtF modality enabling cooperation and an establishment of a relationship with their conversational partner. On the other hand, CMC restricts such peripheral cues which females rely upon to develop and establish a relationship, ascertain their partner's motivation and using nuances to determine their verdict and decisions. This is supported in the current data, with females being near the chance level for persuasion when using CMC, implying that the persuasive messages had little effect on the changes in verdict choice within this modality. However, Guadagno and Cialdini (2002; 2007) also noted that males were unaffected by the reduction in media richness stating it was unimportant to their social motivation of competition and independence. The restrictive medium in the present study however elicited significant resistance from males suggesting that, like females, they are sensitive to the non-verbal restriction of media richness, albeit more pronounced.

Eaton, Visser, & Burns (2017) revealed that priming gender affected the persuadability of individuals. When female gender was made salient, both men and women demonstrated much weaker attitudes and enhanced superficial processing of the messages received. Male salience however, enabled participants to process the message in a much more thoughtful manner, with increased cognitive processing, seemingly in line with the social roles concept that men are more analytical and rational compared to women. Perhaps then, the salience of one's gender was made more apparent during the anonymous CMC interaction given the reduction in media richness and thus the enhancement of self-

274

awareness. This is evident in research conducted by Okdie et al. (2011), finding that the CMC modality made participants much more self-focussed and self-aware compared to FtF. These findings help to explain the gender differences in susceptibility to persuasive messages, indicating that females take a heuristic route to processing messages whereas men, who focus more on the rational arguments presented, utilise the systematic route to processing information. This is evidenced further in the present study, with male responses to pre- and post-questionnaires highlighting their propensity to reason analytically and have an absence of emotions when explaining their reasoning for initial verdict choices compared to female mock-jurors.

One possible explanation for this pattern of findings lies in the fact that the other two media-rich environments allowed real-time audio, thus gender identification of the opposing speaker could be easily ascertained. Yet in the CMC modality, this was impossible given the anonymity the medium affords. Perhaps then, males were less likely to monitor and restrain their opinions and thoughts. Indeed, research investigating same-sex dyadic interactions highlight how males when interacting with another male enhance their gender stereotypes, leading to increase levels of competition and disagreements (Carli, 1989). Perhaps an inability to ascertain the opposing gender yet a propensity to make assumptions of same-gender interactions (50% of males believed they were communicating with a male confederate, whilst 28% were unsure; 44% of females believed they were communicating with a female confederate, whilst 22% were unsure – thus only 22% of males, and 35% of females were correct in identifying the gender of their anonymous communicative partner) led to an increased sense of self (Okdie et al., 2011) and enhancement of gendered social roles (Postmes & Spears, 2002).

Research into gender differences within VR is extremely limited meaning that very little can be inferred inside such synthetic environments. As a result, the present studies serve to grow this area of research, with findings reported here indicating similar

persuasive outcomes across genders within this novel modality. It proposes that a VRE serves to equalise gender effects when both areas of social roles can be satisfied. I.e., ability to form communal bonds via real-time audio for women, and the ability to scrutinise arguments and assert dominance in a relatively anonymous fashion for men.

Ethnicity is fast becoming a pervasive feature of social structure, playing a part in everyday interactions and political debate given the increasing numbers of societies becoming ethnically diverse (Verkuyten, 2018). Yet cultural psychology has almost exclusively tended to focus on the extremes of individualistic and collectivist cultures (Ind/Col). For example, there is consensus amongst previous research that Asian ethnicities are more holistic in their thinking, defaulting to the heuristic route when processing persuasive messages, whereas Westerners, such as Caucasian American or Europeans, tend to be more analytic and thus are more motivated to elaborate on persuasive messages and engage in a more systematic manner (e.g., Berry, Poortinga, Breugelmans, Chasiotis, & Sam, 2011; Nisbett, Choi, Peng, & Norenzayan, 2001; Nisbett & Masuda, 2003; Varnum, Grossman, Kitayama, & Nisbett, 2010). The research contained within this thesis extends the extremes of Ind/Col concepts, investigating foreign-, and first-born individuals that span the continuum of such classifications yet are still considered within the binary concept of Ind/Col (see Oyserman et al., 2002). The results show that slight changes in these ethnic categories serves to diminish reported ethnic differences in social cognition, indicating similarities for South-Asian and British persuadability which hold across FtF and DMs. In turn, this points to similarities in the routes taken to process the persuasive messages during the jury discussion.

One might suggest that the lack of findings for ethnicity could be due to a lack of diversity within dyadic teams, given this research focussed on homogenous ethnic groups to enable a direct comparison. And yet, research which has manipulated DMs across

homogenous and heterogenous cultural groups have found similar effects. For example, Setlock and colleagues (2007) investigated Chinese and American ethnic groups, finding no differences for culture or modality (audio and video) on persuasion, with persuasion outcomes measured in a similar way to the current study - summing differences in pre- to post-discussion rankings. Furthermore, their measurement of word count revealed similarities across the two cultural groups for both DMs, remaining consistent with the current findings presented in this chapter.

Perhaps integration of ethnic groups is serving to dampen previous reports of differences, with this pattern of findings being accounted for by situational ethnicity. This concept specifies that identification of one's ethnic group can either be displayed or concealed contingent on the social situation (Okamura, 1981). For example, physical surroundings, presence (or absence) of others or type of task (Belk, 1974). If the concept of 'felt' ethnicity is situationally determined (Stayman & Deshpande, 1989), then perhaps the fact that the research was conducted in English, by a white Caucasian researcher, in primarily British universities influenced the outcomes reported here. For example, Western learning places critical thinking and debate at the heart of its educational system, with students often taught by communicating and determining whether or not the information received is verifiable (Garrison, 1991; Kühnen et al., 2012). The majority of the current research was conducted within two British universities, aiming to instil critical thinking. Furthermore, the jury paradigm actively promotes debate and a need to evaluate the information presented, which may have served to situationally dampen any ethnic differences.

When comparing the current lack of ethnic differences to existing research, one aspect of the published data became apparent – there was a lack of reporting of any null results. Perhaps then, these findings reflect a publication bias, given that the current null findings are unlikely to have been published in a peer-reviewed journal if previously

observed (Franco, Malhotra, & Simonovits, 2014). The 'file draw problem' (bias towards selecting statistically significant studies to write up for publication; Lederman & Lederman, 2016) seemingly dominates the published literature. It suggests that cross-ethnic diversity is 'watering down' any social cognitive differences previously observed in cultural domains, and the current results are reflective of the true population which represents increased integration and long-term migration (Berry, 1997; Tranter & Hobbs, 2017).

7.4.4 Cognitive style. Individuals in the general population high on delusional thinking have previously been found to request less information and be more confident in their decisions (Huq, Garety & Hemsley, 1988). Likewise, high scores on the need for cognitive closure (whether situationally induced or individually manipulated) report similar effects, whereby individuals tend to 'seize' and 'freeze' upon seemingly reliable and valid decisions (Kruglanski, Webster, & Klem, 1993). Indeed, Colbert and Peters (2002) reported that high delusional ideation in the general population was correlated with higher scores on the NfCC scale. Yet, the present study reported no association for delusional ideation and the NfCC, in addition to biases associated with high scores on these measures failing to influence persuasion outcomes. This is despite research attesting to individuals making simplified judgements and 'shortcuts' when scoring highly on these measures, indicating a heuristic route to processing information (Kossowska, 2007; Klein & Webster, 2000) and a greater openness to persuasion attempts during dyadic jury interactions (Kruglanski, Webster, & Klem, 1993; Richter & Kruglanski, 2004). It may be that individuals low in NfCC and PDI-R are less likely to freeze and seize upon information as stated, but this was not shown to influence persuasion outcomes in the current research and thus indicates a lack of preference for the heuristic route to persuasion. It shows that biases in processing associated with these measures did not

influence decisions upon exposure to persuasive messages across the three modalities. One possibility proposed by Ross et al. (2016) is the data gathering bias is not directly associated with delusional ideation but rather analytical cognitive style, enabling individuals to critically evaluate information and engage in effortful analytical processing. It implies that a measure of delusional ideation would not result in significant effects as it does not adequately assess biases associated with data-gathering, the core of which was being measured and assessed in relation to persuadability.

Interestingly, and unusually, South-Asian participants scored higher on average for delusional thinking compared to British participants, who primarily fell into the low category for this measure. It is not entirely clear as to why this occurred, but it should be noted that the creation of the PDI-R primarily utilised white british participants in their sample. Consequently, this demographic was used to ascertain validity and reliability of the 21-item scale (Peters et al., 2004) highlighting a lack of ethnic and cultural diversity for this measure, and making it much harder to attribute findings across ethnic and cultural divides.

The unique findings reported here could be accounted for by religious belief. For example, research conducted by Britain's largest independent social research agency has recently reported that over half of the British population consider themselves to have no religion (NatCen, 2017). Whereas South-Asian countries are often noted to have predominantly religious-based societies (Bose & Jalal, 2002; Russell, 2015; WorldAtlas, 2018). Question 8 and question 11 on the PDI-R asks whether participants 'feel especially close to God' or 'feel they were chosen by God in some way'. A high score which depicts thinking about this issue 'frequently' and 'believing it to be true' contributes to higher PDI-R results reported here, and could possibility be accounted for by religious affiliation. Investigation into new religious movements have noted significantly higher delusional ideation but such individuals have reported feeling less distressed and preoccupied with

these beliefs (measured on sub-scales within the PDI-R; Peters, Day, McKenna, & Orbach, 1999; Ross et al., 2016).

Pennycook, Cheyne, Seli, Koehler, and Fugelsang (2012) discovered that analytical cognitive style was negatively associated with religious and paranormal beliefs, even when controlling for age, sex, cognitive ability, religious engagement, political ideology, and education. It supports the claim by Ross et al. (2016) that delusional ideation is associated with analytical cognitive style, suggesting that high scores on PDI-R is associated with lower analytical cognitive style and higher rates of religious beliefs. For example, atheists lack of belief has been claimed to be derived from logical, intelligent, and rational thinking (Caldwell-Harris, Wilson, LoTempio, & Beit-Hallahmi, 2010; Hunsberger & Altemeyer, 2006). It therefore seems logical to assume that individuals who reject religious beliefs display a more analytical cognitive style, processing information via System 2 in a deliberate and effortful manner (see Kahneman, 2003), and perhaps take the systematic route to persuasion. Despite a lack of relationship between PDI-R, NfCC and persuasion outcomes in this body of research, it would be beneficial for future researchers to consider this aspect of delusional thinking when designing and conducting further studies. Perhaps incorporating the 9-item religious belief and 5-item religious engagement scales developed by Pennycook et al. (2012), as well as a measure of analytical processing (e.g., the cognitive reflection test; Frederick, 2005) into future methodologies would be beneficial.

7.4.5 Linguistic style. Using language to investigate persuasion is beneficial in that it is rich, convenient and quantifiable. The analysis of words used in the jury discussions served to illuminate mock-jurors' social cognition - investigating what mock-jurors pay attention to, and reflecting their psychological state when exposed to counter-attitudinal messages. Given that the majority of the English language comprises of function words, yet conscious attention is rarely paid to their usage in everyday exchanges, they can

reveal valuable insight into mock-jurors implicit thinking processes and psychological states, thus reflecting an individual's 'linguistic style' (Chung & Pennebaker, 2007; Pennebaker, Mehl, & Niederhoffer, 2003; Tausczik & Pennebaker, 2010). The findings in the current research revealed that linguistic style consistent with successful persuasion outcomes comprises of enhanced cognitive processing and informal language but lower instances of analytical reasoning.

Cognitive processes, measured by LIWC, contain words relating to insight ('think', 'know'), causation ('because', 'effect'), discrepancy ('should', 'would'), tentative ('maybe', 'perhaps'), certainty ('always', 'never'), and differentiation ('hasn't', 'but'). Together, they indicate active thinking on behalf of the individual. Here, higher scores depicted successful persuaded outcomes, perhaps reflecting individual wishes to understand the cause and meaning of the arguments presented, elaborating to a higher extent (see Figure 1.2). Individuals scoring highly on analytical thinking are argued to engage in effortful deliberation using reason and logic, depicted by the increased use of nouns, articles and prepositions (Jordan & Pennebaker, 2017). Once again, this indicates a more systematic route to processing information when successfully persuaded, and points to this route having more success in changing mock-jurors' minds when they actively engage in the discussion. Initially called the categorical versus dynamic index (CDI: Pennebaker et al., 2014), it is scored on a continuum, with lower scores depicting a narrative (dynamic) style of thinking.

Narrative thinking is often seen in impulsive individuals' linguistic style, their reasoning grounded in intuition and personal experience, apparent through increased use of pronouns, auxiliary verbs and common adverbs (Jordan & Pennebaker, 2017). It may reflect a systematic route of processing information for non-persuaded mock-jurors, with individuals breaking down the scenario and analysing the confederate's persuasive arguments in a logical and complex manner (Boyd & Pennebaker, 2015). Likewise,

persuaded mock-jurors' linguistic style conceivably reflects a more heuristic route to processing information, with under 10% of linguistic style in FtF and VR modalities containing analytical language, further supporting the argument above regarding richer modalities facilitating the peripheral route to persuasion. Furthermore, Jordan and Pennebaker (2017) found that narrative language is much more personal and informal, which concurs with the current findings regarding persuaded mock-jurors scoring low on analytical thinking (and thus higher on the narrative side of the spectrum) but high on informal linguistic style.

Chapter Eight: Application, Limitations and Future Directions

8.1 Introduction

Throughout the empirical chapters of this thesis the results have been introduced and discussed. In addition, the preceding chapter has presented full analyses across contexts, and offered a discussion of all three data sets previously presented in Chapters 4 to 7. Throughout, these data have been discussed with reference to the theory and available empirical literature relevant to the context presented in each chapter. Hence, an additional final discussion chapter is unnecessary because it would simply repeat discussion topics already presented. However, thus far this thesis has not discussed the application of any of the findings, nor have future direction or limitations been fully introduced or discussed and so this final chapter will consider these aspects within the body of research presented. In addition to presenting a body of empirical laboratory research designed to inform the psychological cognitive literature and develop paradigms for understanding cognition in novel contexts, this thesis was also concerned with supporting practitioners who are tasked with interacting with others in persuasive contexts. To that end, this final chapter will also consider the practical implications of the results reported, the limitations of this research and how future researchers might move towards improving and expanding on the work reported here.

8.2 Applications

The increasing use of social media and serious gaming technology (Wilson et al., 2016) highlights the importance of investigating exchanges of information across both rich and lean modalities. This research has shown that the VRE is as effective as the FtF context for persuasion purposes, which has ramifications for real-world effects when utilising VR technology to observe, measure and train real-world performances (see Dando

& Tranter, 2016; Sandham, Ormerod, Dando, & Menacre, 2015). VEs are currently being utilised in military and forensic settings, simulating real-world interactions and behaviours in a safe and efficient manner. For example, the Federal Law Enforcement Training Center have developed an avatar-based interview simulator which enables officers to practise persuasion techniques and develop their skill set prior to real-world interviews (Kuykendall, 2010). Alternate contexts for non-coercive investigative interviews (Dando & Ormerod, in press; Jenkins & Dando, 2012) can facilitate the use of 'soft power' by aiming to influence through developing an operational accord and persuading others to change their beliefs and opinions through attraction rather than using forceful, coercive techniques (Beune, Giebels, & Taylor, 2010; Dando & Tranter, 2015; Nye, 2004). Thus, this exploratory research serves to progress and offer additional insight into applied uses of VREs for investigative purposes, which in an increasingly global environment, is important.

Online media is often regarded as influential in the promotion of extremist propaganda, providing opportunities to communicate, disseminate, recruit, solicit monetary funds and conduct attacks (Prentice & Taylor, 2018). Yet the findings here suggest persuasion using CMC is ineffective. CMC may still be a useful first point of contact, but this form of communication as outlined in this thesis appears not to be an effective environment within which to effectively progress a persuasive conversation to the desired conclusion. This suggests that media stories concerning radicalisation via CMC may be misleading – it is not the medium *per se* that is enabling and enhancing such behaviour but rather something else. Perhaps the profile surrounding social media (either real or faked) serves to lure individuals in; seeking out those who hold similar beliefs, with comparable platforms and networks acting as echo chambers, narrowing critical perspectives meaning that a first interaction has much more of a positive response when exposed to persuasive material. This study has contributed to the understanding through which certain persuasive

devices are used - in this case, anonymous synchronous communication with an unknown communicative partner is not sufficient to solely influence and change opinion.

As noted, the use of digital modalities provides challenges in establishing the credibility and validity of sources when anonymous. Understanding persuasion online is becoming increasingly important in an age of increasing political propaganda and extremist ideologies. Propaganda, according to Taylor (2003), refers to a process by which an idea or opinion is communicated to someone else, by any available media in an attempt to persuade the receiver to behave or think in a manner desired by the source. In an era of 'fake news' dominating headlines, online persuasion and propaganda can reach increasingly diverse and vast audiences (Parker, May 2018), playing an important part in mobilising, informing and influencing groups across the world (see Adesina, 2017; Baines & Jones, 2018; Howard et al., 2011). Thus, it may be that individuals are becoming increasingly reluctant to trust and thus be persuaded when interacting online in an anonymous fashion. This is useful to consider when regarding the spread of fake news and online propaganda, which may provide barriers to intelligence gathering professionals when interacting anonymously online.

Creating digital modalities to immerse participants, manipulate variables of interest, and measure and collect information regarding the differences in social cognition does serve to further understanding of information gathering, influence and persuasion online. This research does not claim to change the nature of influence and persuasion in digital modalities, but it does serve to support understanding and contribute to the literature on this topic.

8.3 Strengths and Limitations

The current research has a number of strengths and limitations. In the case of the latter, many of the limitations are common to most laboratory-based research studies of

this nature, and as such are not discussed in any detail here. Rather, relevant limitations have been highlighted in the relevant chapters. However, it is worth pointing out again that the reduced reality inherent in laboratory work and obvious lack of consequences that occur in the real word when asked to make decision and/or when one changes one's mind is an enduring limitation. However, the value of the insight emanating from controlled conditions where extraneous variables can be managed is important, and as such the benefits offset these limitations to a certain extent. In addition, there are a number of strengths and limitations particular to this research that are worthy of additional discussion, which are as follows.

Firstly, one particular strength of the adapted paradigm utilised to measure persuasion was that it allowed for an interactive and immediate exchange of information between both confederate and participant. This permitted a bilateral and natural discussion to occur, with the end goal being to reach a unanimous decision and thus persuade the individual to change their verdict choice. This is in direct contrast to traditional unilateral methodologies typically seen within the persuasive literature, and so this thesis contributes to the domain by offering a more realistic oversight into persuasion - both FtF, and across social media platforms. In addition, the use of an ambiguous case study resulted in persuasion occurring not as a result of strengths of arguments or credibility of the source (as often reported within previous research; Petty & Cacioppo, 1986b), but as a result of modality, gender manipulations and the accompanying emergent linguistic styles.

Despite the novelty of this research, the findings are compatible with long-term persuasion outcomes. For instance, the paradigm required participants to self-generate arguments, providing individuals with the freedom to choose their verdict choice. It also required participants to explain and justify their views to another individual, whilst simultaneously evaluating and critiquing the persuasive messages in real-time (rather than post-hoc). These elements are associated with increased persistence of persuasive decisions

286

and thus indicate that outcomes measured are not indicative of short-term effects or surface-level compliance, but rather durable and potentially resilient viewpoints (Petty & Briñol, 2015). Nevertheless, discerning the permeability of changes in verdict choice would be beneficial, as it would not only shed light on the durability and success of the persuasive messages, but it could also serve to clarify which route mock-jurors took when changing their opinions (the systematic route being indicative of increased persistence over time; Di Blasio & Milani, 2008).

One particular limitation of the current research is the relationship between first-time interactions and long-term exchanges, and how the former informs/impacts upon the latter. Often when communicating online, individuals either know the individual offline or have an expectation of long-term and/or real-world contact in the foreseeable future and can thus utilise a wider variety of persuasive techniques, such as reciprocity or authority (Cialdini, 1984). The purpose of the current research was to initiate an understanding of persuadability across different modalities, manipulating variables such as gender to understand their effect on persuasion outcomes following an initial and brief contact. Nevertheless, expansion of these findings could be considered constrained as a result.

A second limitation is the use of computerised linguistic analysis, such as LIWC utilised here, which is undoubtedly a crude measurement for psychological behaviour. For example, it does not have the capacity to correctly code for sarcasm or irony. Thus, the meaning and intent of words can be lost as a result. Nevertheless, such systems are often regarded as a simple way to compute and interpret the cognitive and psychological underpinnings of linguistic style in a uniquely quantitative manner and have been used to inform understanding across a variety of topic areas, to great effect (Chung & Pennebaker, 2007; Kacewicz, Pennebaker, Davis, Jeon, & Graesser, 2013; Taylor et al., 2013). LIWC has offered insight into what participants pay attention to, examining the subconscious

processing of persuasive messages via evaluation of function words, which begins to address a gap in the current persuasive literature.

A further limitation concerns the linguistic findings which summarises the exploratory results; evaluating and analysing linguistic output using high level categories, making it difficult in some cases to pinpoint the cause of significant linguistic findings. Numerous past studies have conducted research in this manner (e.g., Cohn, Mehl, & Pennebaker, 2004; Romero, Uzzi, & Kleinberg, 2016) and given the lack of linguistic research into the areas covered in this thesis, an exploratory top-down approach was taken. Nevertheless, it makes it difficult to ascertain specific elements of the linguistic themes analysed. For example, cognitive processing which was significantly higher for successful persuasive interactions depicts a variety of responses and subthemes that can be considered conflicting. For example, does tentative language or certainty contribute to this effect? It would therefore be prudent for future research to investigate the cause of this significant finding at the sublevels of the LIWC categories.

8.4 Future Directions

Like the majority of novel research, the current findings serve to answer some questions whilst inevitably raising others. For example, the purpose of this research was to establish three distinct environments which vary in media richness, but which are considered popular in their usage; serving to contribute to, and expand upon, applied cognitive research. Inevitably however, it is unclear whether findings can be generalised to other forms of DMs which facilitate bilateral interactions, such as asynchronous CMC (e.g., email, blogs), video conferencing (e.g., FaceTime or Skype), or 3-D synthetic realities which create third-person avatars and interact via written messages (e.g., Second Life, World of Warcraft). Future research should consider expanding the range of DMs

under investigation to enable a wider understanding of persuasion across increasingly varied digital modalities.

Similarly, the ability to represent the self online via an avatar offers intriguing opportunities, as touched upon in Chapter 6. The Proteus effect claims that individuals conform to the stereotypical behaviours of the avatar they represent (Yee & Bailenson, 2007), with online environments facilitating greater flexibility for self-presentation. DMs offer unique opportunities to manipulate visual appearance with increasing ease, enabling researchers to investigate the effects of individual differences and characteristics such as source attractiveness or in-group favouritism on persuasion in a controlled environment; allowing for a better understanding of influence and attitude change online, and its ability to translate into real-world effects (see Nowak & Fox, 2018). For example, manipulating an avatar to appear more attractive could have implications for investigators by increasing positive valence and potentially enhancing persuasion outcomes (e.g., Skalski & Tamborini, 2007). It would be prudent for future research to advance understanding of the effects of avatar customisation, in addition to the role that immersive avatar interaction has on enhancing real-world social cognition to best effect (see Taylor & Dando, 2018).

Furthermore, when this research was first envisioned and conducted, VREs were understandably less advanced. Rapid technological developments have since led to an increase in VR ability, whilst prices have become increasingly competitive suggesting an increase in general uptake and usage for such equipment. One such advance in technology refers to haptic feedback, with Oculus Rift now enabling touch features via tracked controllers. Not only could this increase immersion and presence on behalf of the user, but it can allow researchers increased opportunities to explore kinesic effects on the persuasion process inside a virtual space. For example, previous FtF research has indicated how posture and body language can influence confidence, competence and attitude change (Burgoon, Birk, & Pfau, 1990; Maslow et al., 1971).

A further and related avenue for future research would be to expand on linguistic mimicry (here measured through LSM) and investigate the role of non-verbal social mimicry on persuasion effects. The chameleon effect (Lakin, Jefferis, Cheng, & Chartrand, 2003) is the tendency to adopt gestures and mannerisms of one's interactive partner. This has previously been found to increase affiliation and foster relationships. Yet it is difficult to manipulate such behaviour in isolation in the real-world. DMs however afford the chameleon effect to be manipulated and investigated in a tightly controlled manner. For example, Bailenson and Yee (2005) found that when avatars mimicked participants behaviour, and participants were not conscious of this effect, avatars were more persuasive and received more positive trait ratings than non-mimicking avatars. Yet the authors here investigated persuasion in a unilateral, passive context. It would be interesting to further investigate the role of behavioural mimicry on bilateral, interactive exchanges, and their effect on persuasion outcomes given the recent advances in VR technology.

A conscious decision was made in the present research to include English-speaking participants, who were grouped using broad definitions of culture and ethnicity, in line with previous research (e.g., Nisbett & Miyamoto, 2005). Whilst it serves to expand the consideration of alternate ethnic groups on persuasion outcomes indicative of an increasingly ethnically-diverse population, we acknowledge that there is inevitably variation at the country *and* individual level. Expanding on ethnicity and including measures of cultural characteristics (such as the Schwartz Value Survey [Schwartz, 2012], The Value Survey Module [Hofstede, Hofstede, Minkov, & Vinken, 2013], or the Cultural Values Scale [Yoo, Donthu, & Lenartowicz, 2011]) could add credibility to the findings reported here. Furthermore, expanding the paradigm to include research *within* the countries and cultures of interest and potentially conducted in one's native language could serve to bolster cultural influences on social cognition.

8.5 Conclusion

With the rise of the internet, persuasion is increasingly important in the transmission of social, political and diplomatic exchanges. Growing migration and technological change is diminishing physical and psychological boundaries, conceivably influencing decision-making. This thesis set out to explore the role of digital modalities on persuasion outcomes, examining individual differences such as gender, ethnicity, linguistic and cognitive style. It utilised previously-applied psychological methodologies such as the jury method paradigm to establish realistic, bilateral exchanges of persuasive messages. In combination, this research has shown that interpersonal persuasion is difficult to create and sustain when using anonymous, instant messaging software, leading to enhanced resistance for males, increased delays and reduced affinity for the conversational partner. The novel VRE however established principally analogous results to FtF, indicating a propensity for persuasion and increased confidence for change in decisions when employing media-rich modalities. This has important consequences for investigators who wish to advance the uses of VR to manipulate, collect, measure, and manage persuasive outcomes and social cognition to great effect. Expanding and developing our understanding of how judgements are formed and modified can serve to increase working relationships and widen the discussion and evidence concerning the management of conversations both on- and offline.

References

Aaker, J., & Maheswaran, D. (1997). The effect of cultural orientation on persuasion. *The Journal of Consumer Research, 24*(3), 315-328.

Abelson, R. P., & Miller, J. C. (1967). Negative persuasion via personal insult. *Journal of Experimental Social Psychology*, *3*(4), 321-333.

Adesina, O. S. (2017). Foreign policy in an era of digital diplomacy. *Politics and International Relations, Cogent Social Sciences, 3*(1), Article ID: 1297175.

Allport, G. W. (1935). Attitudes. In Murchison, C. (Ed.), *A Handbook of social psychology* (pp. 798-844). Worcester, MA, US: Clark University Press.

Ambady, N., Bernieri, F. J., & Richeson, J. A. (2000). Toward a histology of social behavior: Judgmental accuracy from thin slices of the behavioral stream. In M. P. Zanna (Ed.). *Advances in experimental social psychology* (Vol. 32, pp. 201–271). San Diego, CA: Academic Press.

Ambady, N., & Gray, H. M. (2002). On being sad and mistaken: Mood effects on the accuracy of thin-slice judgments. *Journal of Personality and Social Psychology*, *83*(4), 947-961.

American Psychiatric Association (1994). *DSM-IV-TR: Diagnostic and statistical manual of mental disorders.* Washington, DC: APA.

Andersen, K. (1971). *Persuasion: Theory and practice*. Boston, MA: Allyn & Bacon.

Areni, C. S., & Sparks, J. R. (2005). Language power and persuasion. *Psychology & Marketing*, *22*(6), 507-525.

Atlas, S., & Putterman, L. (2011). Trust among the avatars: Playing trust games in a virtual world, with and without textual and visual cues. *Advances in Consumer Research, 38*, 122-125.

Babad, E. Y., Ariav, A., Rosen, I., & Salomon, G. (1987). Perseverance of bias as a

function of debriefing conditions and subjects' confidence. *Social Behaviour, 2*(3), 185-193.

Bailenson, J. N., Blascovich, J., Beall, A. C., & Noveck, B. (2006). Courtroom applications of virtual environments, immersive virtual environments, and collaborative virtual environments. *Law & Policy*, *28*(2), 249-270.

Bailenson, J. N., & Yee, N. (2005). Digital chameleons: Automatic assimilation of nonverbal gestures in immersive virtual environments. *Psychological Science, 16*(10), 814-819.

Baines, P., & Jones, N. (2018). Influence and interference in foreign elections: The evolution of its practice. *The RUSI Journal, 163*(1), 12-19.

Baltes, B. B., Dickson, M. W., Sherman, M. P., Bauer, C. C., & LaGanke, J. S. (2002). Computer-mediated communication and group decision making: A meta-analysis. *Organizational Behavior and Human Decision Processes*, *87*(1), 156-179.

Balzan, R., Delfabbro, P., Galletly, C., & Woodward, T. (2012). Reasoning heuristics across the psychosis continuum: The contribution of hypersalient evidence hypothesis matches. *Cognitive Neuropsychiatry*, *17*(5), 431-450.

Banakou, D., & Chorianopoulos, K. (2010). The effects of avatars' gender and appearance on social behavior in online 3D virtual worlds. *Journal for Virtual Worlds Research*, *2*(5), 3-16.

Banas, J. A., & Rains, S. A. (2010). A meta-analysis of research on inoculation theory. *Communication Monographs, 77*(3), 281-311.

Bandura, A. (1991). Social cognitive theory of self-regulation. *Organizational Behavior and Human Decision Processes*, *50*(2), 248-287.

Bargh, J. A., McKenna, K. Y., & Fitzsimons, G. M. (2002). Can you see the real me? Activation and expression of the "true self" on the Internet. *Journal of Social Issues*, *58*(1), 33-48.

Barth, F. (1998). *Ethnic groups and boundaries: The social organization of culture difference*. Long Grove, IL: Waveland Press.

Basow, S.A. & Rubenfeld, K. (2003). "Troubles talk": Effects of gender and gender typing. *Sex Roles, 48*(3), 183-187.

Bekhet, A. K., & Zauszniewski, J. A. (2012). Methodological triangulation: An approach to understanding data. *Nurse Researcher*, *20*(2), 40-43.

Belk, R. W. (1974). An exploratory assessment of situational effects in buyer behavior. *Journal of Marketing Research, 11*(2), 156-163.

Bell, V., Halligan, P.W., Ellis, H.D., 2006. The Cardiff anomalous perceptions scale (CAPS). *Schizophrenia Bulletin 32*(2), 366–377.

Bem, D. J. (1972). Self-perception theory. *Advances in Experimental Social Psychology, 6,* 1-62.

Bentall, R. P., Corcoran, R., Howard, R., Blackwood, N., & Kinderman, P. (2001). Persecutory delusions: A review and theoretical integration. *Clinical Psychology Review, 21*(8), 1143-1192.

Berger, C. R., & Bradac, J. J. (1982). *Language and social knowledge: Uncertainty in interpersonal relations*. London: Hodder Arnold.

Berry, J. W. (1997). Immigration, acculturation, and adaptation. *Applied Psychology, 46*(1), 5-34.

Berry, J. W., Poortinga, Y. H., Breugelmans, S. M., Chasiotis, A., & Sam, D. L. (2011). *Cross-cultural psychology: Research and applications, 3rd edition.* Cambridge, UK: Cambridge University Press.

Berry, R. N. (1960). An extension of Foley's 'Expression of Certainty'. *American Journal of Psychology, 73*, 639-640.

Betancourt, H., & López, S. R. (1993). The study of culture, ethnicity, and race in American psychology. *American Psychologist*, *48*(6), 629-637.

Betancourt, J. R., Green, A. R., Carrillo, J. E., & Ananeh-Firempong II, O. (2003). Defining cultural competence: A practical framework for addressing racial/ethnic disparities in health and health care. *Public health reports, 118*(4), 293-302.

Beune, K., Giebels, E., & Taylor, P. J. (2010). Patterns of interaction in police interviews: The role of cultural dependency. *Criminal Justice and Behavior, 37*(8), 904-925.

Bishara, A. J., & Hittner, J. B. (2012). Testing the significance of a correlation with nonnormal data: Comparison of pearson, spearman, transformation, and resampling approaches. *Psychological Methods*, *17*(3), 399-417.

Blankenship, K. L. (2001). *Linguistic power and persuasion: An analysis of various language style components* (Master's thesis). Retrieved from Ball State University (5188).

Blankenship, K. L., & Holtgraves, T. (2005). The role of different markers of linguistic powerlessness in persuasion. *Journal of Language and Social Psychology, 24*(1), 3-24.

Bohner, G., Chaiken, S., & Hunyadi, P. (1994). The role of mood and message ambiguity in the interplay of heuristic and systematic processing. *European Journal of Social Psychology*, *24*(1), 207-221.

Bohner, G., Moskowitz, G. B., & Chaiken, S. (1995). The interplay of heuristic and systematic processing of social information. *European Review of Social Psychology, 6*(1), 33-68.

Bombari, D., Schmid Mast, M., Canadas, E., & Bachmann, M. (2015). Studying social interactions through immersive virtual environment technology: Virtues, pitfalls, and future challenges. *Frontiers in Psychology, 6* (869), 1-11.

Bond, M. H., & Wang, S. H. 1983. Aggressive behavior in Chinese society: The problem of maintaining order and harmony. In A. P. Goldstein & M. Segall (Eds.), *Global perspectives on aggression* (pp. 58-74). New York: Pergamon.

Booth-Butterfield, S., & Welbourne, J. (2002). The elaboration likelihood model: Its

impact on persuasion theory and research. In J. Price Dillard & Pfau, M. (Eds.),

The persuasion handbook: Developments in theory and practice (pp. 155-174).

California: SAGE Publications.

Bose, S., & Jalal, A. (2002). *Modern south asia: History, culture, political economy.*

New York: Routledge.

Boyd, R. L., & Pennebaker, J. W. (2015). A way with words: Using language for

psychological science in the modern era. *Consumer Psychology in a Social Media

World*, 222-236.

Bradac, J. J., & Mulac, A. (1984). Attributional consequences of powerful and powerless

speech styles in a crisis-intervention context. *Journal of Language and Social

Psychology, 3*(1), 1-19.

Bradley, P. H. (1981). The folk-linguistics of women's speech: An empirical examination.

Communication Monographs, 48, 73-90.

Branigan, H. P., Pickering, M. J., & Cleland, A. A. (2000). Syntactic co-ordination in

dialogue. *Cognition*, *75*(2), B13-B25.

Brehm, J. W. (1966). *A theory of psychological reactance*. New York: Academic Press.

Brignall III, T. W., & van Valey, T. (2005). The impact of the internet of internet

communications on social interaction. *Sociological Spectrum, 25*(3), 335-348.

Briñol, P., & Petty, R. E. (2004). Self-validation processes: The role of thought confidence

in persuasion. In G. Haddock & G. R. Maio (Eds.), *Contemporary perspectives on

the psychology of attitudes* (pp. 205-226). London, England: Psychology Press.

Briñol, P., & Petty, R. E. (2009). Persuasion: Insights from the self-validation hypothesis.

Advances in Experimental Social Psychology, 41, 69-118.

Brock, T. C. (1967). Communication discrepancy and intent to persuade as determinants of

counterargument production. *Journal of Experimental Social Psychology, 3*(3), 269

-309.

Brody, L., & Hall, J. A. (1993). Gender and emotion. In M. Lewis & J. Haviland (Eds.), *Handbook of emotions* (pp. 447–460). New York: Guilford.

Buchy, L., Woodward, T. S., & Liotti, M. (2007). A cognitive bias against disconfirmatory evidence (BADE) is associated with schizotypy. *Schizophrenia Research, 90*(1-3), 334-337.

Burgoon, J. K. (1995). Cross-cultural and intercultural applications of expectancy violations theory. In R. L. Wiseman (Ed.), *International and intercultural communication annual, Vol. 19. Intercultural communication theory* (pp. 194-214). Thousand Oaks, CA: SAGE Publications.

Burgoon, J. K., Birk, T., & Pfau, M. (1990). Nonverbal behaviours, persuasion, and credibility. *Human Communication Research, 17*(1), 140-169.

Burgoon, J. K., Chen, F., & Twitchell, D. P. (2010). Deception and its detection under synchronous and asynchronous computer-mediated communication. *Group Decision and Negotiation, 19*(4), 345-366.

Burnstein, E. (1982). Persuasion as argument processing. In M. Braandstatter, J. H. Davis, and G. Stocker-Kreichgauer (Eds.), *Group decision processes* (pp. 103-122). London: Academic Press.

Bushman, B. J. (1998). Effects of warning and information labels on consumption of fullfat, reduced-fat, and no-fat product. *Journal of Applied Psychology, 83*, 97–101.

Cabinet Office (2011). *The UK cyber security strategy: Protecting and promoting the UK in a digital world.* Cabinet Office: London.

Cacioppo, J. T. & Petty, R. E. (1980). Persuasiveness of communication is affected by exposure frequency and message quality: A theroticial and empirical analysis of persistent attitude change. *Current Issues and Research in Advertising, 3*(1), 97-122.

Cafferata, P. & Tybout, A. M. (1989). *Cognitive and affective responses to advertising*. MA, US: Lexington Books.

Caldwell-Harris, C. L., Wilson, A. L., LoTempio, E., & Beit-Hallahmi, B. (2010). Exploring the atheist personality: Well-being, awe, and magical thinking in atheists, buddhists, and christians. *Mental Health, Religion & Culture, 14*(7), 659-672.

Campbell, M. E., & Cunnington, R. (2017). More than an imitation game: Top-down modulation of the human mirror system. *Neuroscience & Biobehavioral Reviews*, *75*, 195-202.

Carli, L. (1989). Gender differences in interaction style and influence. *Journal of Personality and Social Psychology, 56*(4), 565-576.

Carli, L. (1990). Gender, language and influence. *Journal of Personality and Social Psychology, 59*(5), 941-951.

Carli, L. L. (2001). Gender and social influence. *Journal of Social Issues, 57*(4), 725-741.

Carli, L. L. (2017). Social influence and gender. In S. G. Harkins, K. D. Williams, & J. M. Burger (Eds.), *The oxford handbook of social influence*, (pp. 33-52). Oxford, UK: Oxford University Press.

Carli, L. L., LaFleur, S. J., & Loeber, C. C. (1995). Nonverbal behavior, gender, and influence. *Journal of Personality and Social Psychology*, *68*(6), 1030-1041.

Casey, D., & Murphy, K. (2009). Issues in using methodological triangulation in research. *Nurse Researcher*, *16*(4), 40-55.

Cavazza, N., & Guidetti, M. (2014). Swearing in political discourse: Why vulgarity works. *Journal of Language and Social Psychology, 33*(5), 537-547.

Cervin, V. B., Joyner, R. C., Spence, J. M., & Heinzl Jr, R. (1961). Relationship of persuasive interaction to change of opinion in dyadic groups when the original

opinions of participants are expressed privately and publicly. *The Journal of Abnormal and Social Psychology*, *62*(2), 431-432.

Chaiken, S. (1980). Heuristic versus systematic information processing and the use of source versus message cues in persuasion. *Journal of Personality and Social Psychology, 39*(5), 752-766.

Chaiken, S. (1987). The heuristic model of persuasion. In M. P. Zanna, J. M. Olson, & C. P. Herman (Eds.), *Social influence: The ontario symposium* (Vol. 5, pp. 3-39). Sussex, UK: Psychology Press.

Chaiken, S., Axsom, D., Liberman, A., & Wilson, D. (1992). *Heuristic processing of persuasive messages: Chronic and temporary sources of rule accessibility.* Unpublished manuscript, New York University.

Chaiken, S., & Eagly, A. H. (1983). Communication modality as a determinant of persuasion: The role of communicator salience. *Journal of Personality and Social Psychology, 45*(2), 241-256.

Chaiken, S., Giner-Sorolla, R., & Chen, S. (1996). Beyond accuracy: Defense and impression motives in heuristic and systematic information processing. In P. M. Gollwitzer & J. A. Bargh (Eds.), *The psychology of action: Linking cognition and motivation to behavior* (pp. 553-578). New York: Guildford Press.

Chaiken, S., Liberman, A., & Eagly, A. H. (1989). Heuristic and systematic information processing within and beyond the persuasion context. In J. S. Uleman, & J. A. Bargh (Eds.), *Unintended thought* (pp. 212-252). New York: The Guiford Press.

Chaiken, S., & Maheswaran, D. (1994). Heuristic processing can bias systematic processing: Effects of source credibility, argument ambiguity, and task importance on attitude judgment. *Journal of Personality and Social Psychology, 66*(3), 460 -473.

Chung, C., & Pennebaker, J. W.(2007). The psychological function of function words. In

K. Fiedler (Ed.), *Social communication* (pp. 343-359). New York: Psychology Press.

Chung, S. & Waheed, M. (2016). 'Biased' systematic and heuristic processing of politicians' messages: Effects of source favorability and political interest on attitude judgement. *International Journal of Communication, 10,* 2556-2575.

Cialdini, R. B. (1984). *Influence*. New York: Harper Collins.

Cialdini, R. B., Levy, A., Herman, C. P., & Evenbeck, S. (1973). Attitudinal politics: The strategy of moderation. *Journal of Personality and Social Psychology*, *25*(1), 100-108.

Cialdini, R. B., Petty, R. E., & Cacioppo, J. T. (1981). Attitude and attitude change. *Annual Review of Psychology, 32*(1), 357-404.

Clarkson, J. J., Tormala, Z. L., & Rucker, D. D. (2008). A new look at the consequences of attitude certainty: The amplification hypothesis. *Journal of Personality and Social Psychology*, *95*(4), 810-825.

Clarkson, J. J., Tormala, Z. L., & Rucker, D. D. (2011). Cognitive and affective matching effects in persuasion: An amplification perspective. *Personality and Social Psychology Bulletin*, *37*(11), 1415-1427.

Coates, J., & Cameron, D. (2014). *Women in their speech communities: New perspectives on language and sex*. New York: Routledge.

Cohen, A. R. (1962). A dissonance analysis of the boomerang effect. *Journal of Personality, 30*(1), 75-88.

Cohen, L., Manion, L., & Morrison, K. (2007). *Research Methods in Education. 6th edition*. London: Routledge Falmer.

Cohn, M. A., Mehl, M. R., & Pennebaker, J. W. (2004). Linguistic markers of psychological change surrounding September 11, 2001. *Psychological Science, 15*(10), 687-693.

Colbert, S. M., & Peters, E. R. (2002). Need for closure and jumping-to-conclusions in

    delusion-prone individuals. *The Journal of Nervous and Mental Disease, 190*(1),

    27-31.

Colbert, S. M., Peters, E. R., & Garety, P. A. (2006). Need for closure and anxiety in

    delusions: A longitudinal investigation in early psychosis. *Behavior Research and*

    Therapy, 44(10), 1385-1396.

Conley, J. M., O'Barr, W. M., & Lind, E. A. (1978). The power of language:

    Presentational style in the courtroom. *Duke Law Journal,* 1375-1399.

Coupland, N., & Giles, H. (1988). Introduction: The communicative contexts of

    accommodation. *Language & Communication*, *8,* 175-182.

Cox, T. H., Lobel, S. A., & McLeod, P. L. (1991). Effects of ethnic group cultural

    differences on cooperative and competitive behavior on a group task. *Academy of*

    Management Journal, *34*(4), 827-847.

Creswell, J. W., Plano Clark, V. L., Gutmann, M. L., & Hanson, W. E. (2003). Advanced

    mixed methods research designs. In A. Tashakkori & C. Teddlie (Eds.), *Handbook*

    of mixed methods in social and behavioral research (pp. 209–240). California:

    SAGE Publications.

Daft, R. L., & Lengel, R. H. (1986). Organizational information requirements, media

    richness and structural design. *Management Science*, *32*(5), 554-571.

Dainton, M. (2005). Explaining theories of persuasion. In M. Dainton & E. D. Zelley

    (Eds.), *Applying communication theory for professional life: A practical*

    introduction. (pp. 103-131). Thousand Oaks, California.: SAGE Publications.

Daly, B. L. (1993). The influence of face-to-face versus computer-mediated

    communication channels on collective induction. *Accounting, Management and*

    Information Technologies, *3*(1), 1-22.

Dando., C. J., & Ormerod, T. C. (in press). Intelligence-gathering through persuasive

interviewing. *Psychological Science*.

Dando, C. J., & Tranter, C. L. (2015). Intelligence interviewing: Synthetic environments, cognition, and cognitive styles. *Investigative Interviewing: Research and Practice, 7*(2), 43-51.

Dando, C. J., & Tranter, C. L. (2016). Military and defence applications. In A. Atrill & C. Fullwood (Eds.), *Applied cyberpsychology: Practical applications of cyberpsychological theory and research* (pp. 197- 215). London: Palgrave Macmillan.

DeBono, K. G., & Harnish, R. J. (1988). Source expertise, source attractiveness, and the processing of persuasive information: A functional approach. *Journal of Personality and Social Psychology, 55*(4), 541-546.

Delacre, M., Lakens, D., & Leys, C. (2017). Why psychologists should by default use welch's *t*-test instead of student's *t*-test. *International Review of Social Psychology, 30*(1), 92-101.

De Dreu, C. K., Nijstad, B. A., & van Knippenberg, D. (2008). Motivated information processing in group judgment and decision making. *Personality and Social Psychology Review, 12*(1), 22-49.

Dennis, A. R. (1996). Information exchange and use in small group decision making. *Small Group Research*, *27*(4), 532-550.

Dennis, A. R., Kinney, S. T., & Hung, Y. T. C. (1999). Gender differences in the effects of media richness. *Small Group Research, 30*(4), 405-437.

Deutsch, M., & Gerard, H. B. (1955). A study of normative and informational social influence on individual judgment. *Journal of Abnormal and Social Psychology, 51*(3), 629-636.

Di Blasio, P., & Milani, L. (2008). Computer-mediated communication and persuasion: Peripheral vs. central route to opinion shift. *Computers in Human Behavior, 24*(3),

798-815.

Diener, E., Fraser, S., Beaman, A. L., & Kelem, R. T. (1976). Effects of deindividuating variables on stealing by Halloween trick-or-treaters. *Journal of Personality and Social Psychology, 3*, 99-108.

Difede, J., Cukor, J., Jayasinghe, N., Patt, I., Jedel, S., Spielman, L., Giosan, C., & Hoffman, H. G. (2007). Virtual reality exposure therapy for the treatment of posttraumatic stress disorder following September 11, 2001. *Journal of Clinical Psychiatry*, *68*(11), 1639-1647.

Dillard, J. P., & Pfau, M. (2002). *The persuasion handbook: Developments in theory and practice*. California: SAGE Publications.

Dillard, J. P., & Shen, L. (2005). On the nature of reactance and its role in persuasive health communication. *Communication Monographs*, *72*(2), 144-168.

Ditto, P. H., & Lopez, D. F. (1992). Motivated skepticism: Use of differential decision criteria for preferred and non-preferred conclusions. *Journal of Personality and Social Psychology, 63*, 568-584.

Dodds, T. J., Mohler, B. J., & Bülthoff, H. H. (2011). Talk to the virtual hands: Self-animated avatars improve communication in head-mounted display virtual environments. *PloS ONE, 6*(10), Article ID: e25759.

Downe-Wamboldt, B. (1992). Content analysis: Method, applications, and issues. *Health Care for Women International*, *13*(3), 313-321.

Draper, J. V., Kaber, D. B., & Usher, J. M. (1998). Telepresence. *Human Factors, 40*(3), 354-375.

Dubrovsky, V. J., Kiesler, S., & Sethna, B. N. (1991). The equalization phenomenon: Status effects in computer-mediated and face-to-face decision-making groups. *Human-Computer Interaction, 6*, 119-146.

Dudley, R., John, C., Young, A., & Over, D. (1997). The effect of self-referent material on the reasoning of people with delusions. *British Journal of Clinical Psychology, 36*(4), 575-584.

Eagly, A. H. (1978). Sex differences in influenceability. *Psychological Bulletin*, *85*(1), 86-116.

Eagly, A. H. (1987). *Sex differences in social behavior: A social-role interpretation*. Hillsdale, NJ: Lawrence Erlbaum.

Eagly, A. H., & Carli, L. 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), 1-20.

Eagly, A. H., & Himmelfarb, S. (1978). Attitudes and opinions. *Annual Review of Psychology, 29,* 517-554.

Eagly, A. H., & Steffen, V. J. (1984). Gender stereotypes stem from the distribution of women and men into social roles. *Journal of Personality and Social Psychology*, *46*(4), 735-754.

Eaton, A. A., Visser, P. S., & Burns, V. (2017). How gender-role salience influences attitude strength and persuasive message processing. *Psychology of Women Quarterly, 41*(2), 223-239.

Ebben, M., & Kramarae, C. (1993). Women and information technologies: Creating a cyberspace of our own. In H. J. Taylor, C. Kramarae, & M. Ebben, (Eds.), *Women, information technology, and scholarship*, (pp. 15-27). Urbana, IL: Center for Advanced Study.

Ebbesen, E. B., & Bowers, R. J. (1974). Proportion of risky to conservative arguments in a group discussion and choice shift. *Journal of Personality and Social Psychology, 29*(3), 316-327.

Elias, S. M., & Cropanzano, R. (2006). Gender discrimination may be worse than you

think: Testing ordinal interactions in power research. *The Journal of General Psychology*, *133*(2), 117-130.

Ellemers, N. (2018). Gender stereotypes. *Annual Review of Psychology*, *69*, 275-298.

El-Shinnawy, M., & Vinze, A. S. (1998). Polarization and persuasive argumentation: A study of decision making in group settings. *Management Information Systems Quarterly, 22*(2) 165-198.

Erickson, B., Lind, E. A., Johnson, B. C., & O'Barr, W. M. (1978). Speech style and impression formation in a court setting: The effects of "powerful" and "powerless" speech. *Journal of Experimental Social Psychology*, *14*(3), 266-279.

Fabre, J. M. (1991). The expression of uncertainty: Two contextual effects. *European Journal of Cognitive Psychology, 3*(4), 399-412.

Fear, C. F., & Healy, D. (1997). Probabilistic reasoning in obsessive–compulsive and delusional disorders. *Psychological Medicine, 27*(1), 199-208.

Federico, C. M., Golec, A., & Dial, J. L. (2005). The relationship between the need for closure and support for military action against Iraq: Moderating effects of national attachment. *Personality and Social Psychology Bulletin, 31*(5), 621-632.

Festinger, L. (1957). *A theory of cognitive dissonance*. California: Stanford University Press.

Field, A. (2013). *Discovering statistics using IBM SPSS statistics. 4th edition.* London: SAGE Publications.

Firestone, C., & Scholl, B. J. (2016). Cognition does not affect perception: Evaluating the evidence for" top-down" effects. *Behavioral and Brain Sciences*, *39*, 1-77.

Fiske, S. T. & Taylor, S. E. (1991). *Social cognition* (2nd ed.). New York: McGraw-Hill.

Fiske, S. T., & Taylor, S. E. (2013). *Social cognition: From brains to culture*. New York: SAGE Publications.

Ford, T. E., & Kruglanski, A. W. (1995). Effects of epistemic motivations on the use of

accessible constructs in social judgment. *Personality and Social Psychology Bulletin*, *21*(9), 950-962.

Foss, C., & Ellefsen, B. (2002). The value of combining qualitative and quantitative approaches in nursing research by means of method triangulation. *Journal of Advanced Nursing*, *40*(2), 242-248.

Fox, A. B., Bukatko, D., Hallahan, M., & Crawford, M. (2016). The medium makes a difference. *Journal of Language and Social Psychology, 26*(4), 389-397.

Fox, J., & Ahn, S. J. (2013). Avatars: Portraying, exploring, and changing online and offline identities. In Luppicini, R. (Ed.), *Handbook of research on technoself: Identity in a technological society* (pp. 255-271). Canada: IGI Global.

Franco, A., Malhotra, N., & Simonovits, G. (2014). Publication bias in the social sciences: Unlocking the file drawer. *Science, 345*(6203), 1502-1505.

Frederick, S. (2005). Cognitive reflection and decision making. *Journal of Economic Perspectives, 19*(4), 25-42.

Freeman, D., Bradley, J., Antley, A., Bourke, E., DeWeever, N., Evans, N., Cernis, E., Sheaves, B., Waite, F., Dunn, G., Slater, M., & Clark, D. M. (2016). Virtual reality in the treatment of persecutory delusions: Randomised controlled experimental study testing how to reduce delusional conviction. *The British Journal of Psychiatry, 209*(1), 62-67.

Freeman, D., Pugh, K., & Garety, P. (2008). Jumping to conclusions and paranoid ideation in the general population. *Schizophrenia Research, 102*(1-3), 254-260.

Fullwood, C., & Martino, O. I. (2007). Emoticons and impression formation. *Applied Semiotics*, *19*(7), 4-14.

Fullwood, C., Melrose, K., Morris, N., & Floyd, S. (2013). Sex, blogs, and baring your soul: Factors influencing UK blogging strategies. *Journal of the American Society for Information Science and Technology*, *64*(2), 345-355.

Fullwood, C., Orchard, L. J., & Floyd, S. A. (2013). Emoticon convergence in Internet chat rooms. *Social Semiotics, 23*(5), 648-662.

Furrow, D., & Moore, C. (1990). Gender difference in differentiating terms expressing certainty. *Journal of Psycholinguistic Research, 19*(6), 375-385.

Garcia-Gavilanes, R., Quercia, D., & Jaimes, A. (2013). Cultural dimensions in Twitter: Time, individualism and power. Proceedings of the *Seventh Annual AAAI Conference on Weblogs and Social Media*, *13,* 195-204.

Garety, P. A., & Freeman, D. (1999). Cognitive approaches to delusions: A critical review of theories and evidence. *British Journal of Clinical Psychology, 38*(2), 113-154.

Garety, P. A., & Hemsley, D. R. (1994). *Delusions: Investigations into the psychology of delusional reasoning*. Oxford, UK: Oxford University Press.

Garety, P. A., Hemsley, D. R., & Wessely, S. (1991). Reasoning in deluded schizophrenic and paranoid patients: Biases in performance on a probabilistic inference task. *Journal of Nervous and Mental Disease, 179*(4), 194–201.

Garrison, D. R. (1991). Critical thinking in adult education: A conceptual model for developing critical thinking in adult learners. *International Journal of Lifelong Education, 10,* 287–303.

Gentner, D. (1983). Structure-mapping: A theoretical framework for analogy. *Cognitive Science*, *7*(2), 155-170.

Gibbons, P., Busch, J., & Bradac, J. J. (1991). Powerful versus powerless language: Consequences for persuasion, impression formation, and cognitive response. *Journal of Language and Social Psychology, 10*(2), 115-133.

Giles, H., Coupland, N., & Coupland, J. (1991). Accommodation theory: Communication, context, and consequence. In H. Giles, J. Coupland, & N. Coupland (Eds.), *Contexts of accommodation* (pp. 1-68). Cambridge: Cambridge University Press.

Giner-Sorolla, R., & Chaiken, S. (1997). Selective use of heuristic and systematic

    processing under defense motivation. *The Society for Personaility and Social*

    Psychology, 23(1), 84-97.

Gnisci, A. (2005). Sequential strategies of accommodation: A new method in

    courtroom. *British Journal of Social Psychology*, *44*(4), 621-643.

Gonzales, A. L., Hancock, J. T., & Pennebaker, J. W. (2010). Language style matching as

    predictor of social dynamics in small groups. *Communication Research, 37*(1), 3-

    19.

Greenwald, A. G. (1968). Cognitive learning, cognitive response to persuasion, and

    attitude change. In A. Greenwald, T. Brock, & T. Ostrom (Eds.), *Psychological*

    foundations of attitudes (pp. 147-170). New York: Academic Press.

Grigorovici, D. (2003). Persuasive effects of presence in immersive virtual environments.

    In G. Riva, F. Davide, & W. A. Ijsselsteijn (Eds.), *Being there: Concepts, effects*

    and measurement of user presence in synthetic envionments (pp. 3-16).

    Amsterdam, The Netherlands: IOS Press.

Guadagno, R. E., Blascovich, J., Bailenson, J. N., & McCall, C. (2007). Virtual humans

    and persuasion: The effects of agency and behavioural realism. *Media Psychology,*

    10, 1-22.

Guadagno, R. E., & Cialdini, R. B. (2002). Online persuasion: An examination of gender

    differences in computer-mediated interpersonal influence. *Group Dynamics:*

    Theory, Research, and Practice, 6(1), 38-51.

Guadagno, R. E., & Cialdini, R. B. (2007). Persuade him by email, but see her in person:

    Online persuasion revisited. *Computers in Human Behavior, 23*(2), 999-1015.

Guadagno, R. E., Muscanell, N. L., Okdie, B. M., Burk, N. M., & Ward, T. B. (2011).

    Even in virtual environments women shop and men build: A social role perspective

    on second life. *Computers in Human Behavior, 27*(1), 304-308.

Guerrero, L. K., & Floyd, K. (2006). *Nonverbal communication in close relationships*. New York: Routledge.

Haddock, G., Maio, G. R., Arnold, K., & Huskinson, T. (2008). Should persuasion be affective or cognitive? The moderating effects of need for affect and need for cognition. *Personality and Social Psychology Bulletin, 34,* 769-778.

Haines, R., Hough, J., Cao, L., & Haines, D. (2014). Anonymity in computer-mediated communication: More contrarian ideas with less influence. *Group Decision and Negotiation*, *23*(4), 765-786.

Haleta, L. L. (1996). Student perceptions of teachers' use of language: The effects of powerful and powerless language on impression formation and uncertainty. *Communication Education, 45*(1), 16-28.

Hall, E. T. (1981). *Beyond culture*. New York: Anchor Books.

Hamilton, V. L. (2004). Identification as a challenge to dual-process theories of persuasion. In A. H. Eagly, R. M. Baron, & V. L. Hamilton (Eds.), *The social psychology of group identity and social conflict: Theory, application, and practice* (pp. 65-76). Washington DC: American Psychological Association.

Hamm, R. M. (1991). Selection of verbal probabilities: A solution for some problems of verbal probability expression. *Organizational Behavior and Human Decision Processes, 48*, 193-223.

Hammick, J. K., & Lee, M. J. (2014). Do shy people feel less communication apprehension online? The effects of virtual reality on the relationship between personality characteristics and communication outcomes. *Computers in Human Behavior, 33*, 302-310.

Hancock, A. B., & Rubin, B. A. (2014). Influence of communication partner's gender on language. *Journal of Language and Social Psychology, 34*(1), 46-64.

Hargie, O. (2016). *Skilled interpersonal communication: Research, theory and practice. 6ᵗʰ edition.* London: Routledge.

Herring, S. C. (1993). Gender and democracy in computer-mediated communication. *Electronic Journal of Communication, 3*(2). Retrieved from http://www.cios.org/EJCPUBLIC/003/2/00328.HTML

Herring. S. C. (1994). Politeness in computer culture: Why women thank and men flame. In *Cultural performances: Proceedings of the third Berkeley women and language conference* (pp. 278-294). Berkeley, CA: Berkeley Women and Language Group.

Herring, S. C. (1996). Posting in a different voice: Gender and ethics in computer-mediated communication. In C. Ess (Ed.), *Philosophical perspectives on computer-mediated communication* (pp. 115-145). Albany: SUNY Press.

Herring, S. C. (2003). Gender and power in online communication. In J. Holmes & M. Meyerhoff (Eds.), *The handbook of language and gender* (pp. 202-228). Oxford, UK: Blackwell Publishing.

Herring, S. C., & Stoerger, S. (2014). Gender and (a)nonymity in computer-mediated communication. In S. Ehrlich., M. Meyerhoff., & J. Holmes (Eds.), *The handbook of language, gender, and sexuality* (pp. 567-586). West Sussex, UK: Wiley-Blackwell.

Higgins, E. T. (1996). Knowledge activation: Accessibility, applicability, and salience. In E. T. Higgins & A. W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles*, (pp. 133-168). New York: Guilford Press.

Hiraoka, T., Neubig, G., Sakti, S., Toda, T., & Nakamura, S. (2016). Construction and analysis of a persuasive dialogue corpus. In A. Rudnicky, A. Raux, I. Lane, & T. Misu (Eds.), *Situated dialog in speech-based human-computer interaction* (pp. 125-138). New York: Springer.

HM Government (2016). *National Cyber Security Stategy 2016-2021*. Retrieved from

https://www.gov.uk/government/publications/national-cyber-security-strategy-

2016-to-2021

Hoffman, H. G., Doctor, J. N., Patterson, D. R., Carrougher, G. J., & Furness III, T. A.

(2000). Virtual reality as an adjunctive pain control during burn wound care in

adolescent patients. *Pain*, *85*(1-2), 305-309.

Hoffman, H. G., Patterson, D. R., & Carrougher, G. J. (2000). Use of virtual reality for

adjunctive treatment of adult burn pain during physical therapy: A controlled

study. *The Clinical Journal of Pain*, *16*(3), 244-250.

Hofstede, G. (1980). Culture and organizations. *International Studies of Management and

Organization*, *10*(4), 15-41.

Hofstede, G. (2011). Dimensionalizing cultures: The Hofstede model in context. *Online

Readings in Psychology and Culture, 2*(1), 1-26.

Hofstede, G., Hofstede, G. J., Minkov, M., & Vinken, H. (2013). *Values survey module*.

Retrieved from http://www.geerthofstede.nl

Holtgraves, T., & Lasky, B. (1999). Linguistic power and persuasion. *Journal of Language

and Social Psychology, 18*(2), 196-207.

Hosman, L. A., Huebner, T. M., & Siltanen, S. A. (2002). The impact of power-of-speech

style, argument strength, and need for cognition on impression formation, cognitive

responses, and persuasion. *Journal of Language and Social Psychology, 21*(4),

361-379.

Hovland, C. I., Janis, I. L., & Kelley, H. H. (1953). *Communication and persuasion;

Psychological studies of opinion change.* New Haven, CT: Yale University Press.

Howard, P. N., Duffy, A., Freelon, D., Hussain, M., Mari, W., & Mazaid, M. (2011).

*Opening closed regimes: What was the role of social media during the Arab

spring?* Project on Information Technology and Political Islam. Retrieved from

https://deepblue.lib.umich.edu/bitstream/handle/2027.42/117568/2011_Howard-
Duffy-Freelon-Hussain-Mari-Mazaid_PITPI.pdf?sequence=1&isAllowed=y%20

Hunsberger, B. E., & Altemeyer, B. (2006). *Atheists: A Groundbreaking Study of America's Nonbelievers*. New York: Prometheus Books.

Huq, S. F., Garety, P. A., & Hemsley, D. R. (1988). Probabilistic judgements in deluded and non-deluded subjects. *The Quarterly Journal of Experimental Psychology Section A, 40*(4), 801-812.

Hyde, J. S. (2005). The gender similarities hypothesis. *American Psychologist*, *60*(6), 581-592.

Internet World Stats (2018). *World Internet Users and 2018 Population Stats.* Retrieved from https://www.internetworldstats.com/stats.htm

Ireland, M. E., & Henderson, M. (2014). Language style matching, engagement and impasse in negotiations. *Negotiation and Conflict Management Research, 7*(1), 1-16.

Ireland, M. E., & Pennebaker, J. W. (2010). Language style matching in writing: Synchrony in essays, correspondence, and poetry. *Journal of Personality and Social Psychology, 99*(3), 549-571.

Ireland, M. E., Slatcher, R. B., Eastwick, P. W., Scissors, L. E., Finkel, E. J., & Pennebaker, J. W. (2011). Language style matching predicts relationship initiation and stability. *Psychological Science*, *22*(1), 39-44.

Isenberg, D. J. (1986). Group polarization: A critical review and meta-analysis. *Journal of Personality and Social Psychology*, *50*(6), 1141-1151.

Jamieson, D. W., & Zanna, M. P. (1989). Need for structure in attitude formation and expression. In A. Pratcanis, S. Breckler, & A. G. Greenwald (Eds.), *Attitude structure and function* (pp. 383-406). Hillsdale, NJ: Erlbaum.

Jay, T., & Janschewitz, K. (2008). The pragmatics of swearing. *Journal of Politeness Research: Language, Behaviour, Culture*, *4*(2), 267-288.

Jensen, C., Farnham, S. D., Drucker, S. M., & Kollock, P. (1999). The effect of communication modality on cooperation in online environments. In *Proceedings of the SIGCHI conference on Human Factors in Computing Systems* (pp. 470-477). ACM.

Jenkins, M., & Dando, C. J. (2012). Computer-mediated investigative interviews: A potential screening tool for the detection of insider threat. In *Proceedings of The International Association of Forensic Linguists' Tenth Biennial Conference* (pp. 272-282). Aston University.

Joinson, A. N. (2001). Self-disclosure in computer-mediated communication: The role of self-awareness and visual anonymity. *European Journal of Social Psychology, 31*, 177-192.

Joinson, A. N. (2007). Disinhibition and the internet. In J. Gackenbach (Ed.), *Psychology and the internet: Intrapersonal, interpersonal, and transpersonal implications* (2 ed., pp. 75-92). San Diego: Academic Press.

Joinson, A. N., McKenna, K., Postmes, T., & Reips, U-D. (2009). *The oxford handbook of internet psychology*. New York: Oxford University Press.

Jonas, K., Diehl, M., & Brömer, P. (1997). Effects of attitudinal ambivalence on information processing and attitude-intention consistency. *Journal of Experimental Social Psychology*, *33*(2), 190-210.

Jordan, K. N., & Pennebaker, J. W. (2017). The exception or the rule: Using words to assess analytic thinking, Donald Trump, and the American presidency. *Translational Issues in Psychological Science, 3*(3), 312-316.

Kacewicz, E., Pennebaker, J. W., Davis, M., Jeon, M., & Graesser, A. C. (2014). Pronoun use reflects standings in social hierarchies. *Journal of Language and Social Psychology, 33*(2), 125-143.

Kahle, L. R., & Berman, J. J. (1979). Attitudes cause behaviors: A cross-lagged panel analysis. *Journal of Personality and Social Psychology*, *37*(3), 315-321.

Kahneman, D. (2003). A perspective on judgment and choice: Mapping bounded rationality. *American Psychologist, 58*(9), 697-720.

Kaplan, M. F. (1977). Discussion polarization effects in a modified jury decision paradigm: Informational influences. *Sociometry, 40*(3), 262-271.

Kärkkäinen, E. (2003). *Epistemic stance in English conversation: A description of its interactional functions, with a focus on I think* (Vol. 115). Amsterdam: John Benjamins Publishing.

Kelman, H. C. (2017). Processes of opinion change. In P. Suedfeld (Ed.), *Attitude change: The competing views* (pp. 205-233). New York: Routledge.

Kennedy, R.S., Lane, N.E., Berbaum, K.S., & Lilienthal, M.G. (1993). Simulator sickness questionnaire: An enhanced method for quantifying simulator sickness. *International Journal of Aviation Psychology, 3*(3), 203-220.

Khan, R. F., & Sutcliffe, A. (2013). Attractive agents are more persuasive. *International Journal of Human-Computer Interaction, 30*(2), 142-150.

Kiesler, S., Siegel, J., & McGuire, T. W. (1984). Social psychological aspects of computer-mediated communication. *American Psychologist*, *39*(10), 1123-1134.

Kimbrough, A. M., Guadagno, R. E., Muscanell, N. L., & Dill, J. (2013). Gender differences in mediated communication: Women connect more than do men. *Computers in Human Behavior, 29*(3), 896-900.

Klein, C. T., & Webster, D. M. (2000). Individual differences in argument scrutiny as motivated by need for cognitive closure. *Basic and Applied Social Psychology*, *22*(2), 119-129.

Kolasinski, E. M. (1995). *Simulator sickness in virtual environments* (No. ARI-TR-1027). Army Research Institute for the Behavioral and Social Sciences, Alexandria VA.

Koot, C., ter Mors, E. T., Ellemers, N., & Daamen, D. D. (2016). Facilitation of attitude formation through communication: How perceived source expertise enhances the ability to achieve cognitive closure about complex environmental topics. *Journal of Applied Social Psychology*, *46*(11), 627-640.

Kossowska, M. (2007). Motivation towards closure and cognitive processes: An individual differences approach. *Personality and Individual Differences, 43*(8), 2149-2158.

Kozhevnikov, M. (2007). Cognitive styles in the context of modern psychology: Toward an integrated framework of cognitive style. *Psychological Bulletin*, *133*(3)**,** 464–481.

Kozhevnikov, M., Evans, C., & Kosslyn, S. M. (2014). Cognitive style as environmentally sensitive individual differences in cognition: A modern synthesis and applications in education, business, and management. *Psychological Science in the Public Interest*, *15*(1), 3-33.

Krug, K. (2007). The relationship between confidence and accuracy: Current thoughts of the literature and a new area of research. *Applied Psychology in Criminal Justice*, *3*(1), 7-41.

Kruglanski, A. W. (1989). *Lay epistemics and human knowledge: Cognitive and motivational bases.* New York: Plenum Press.

Kruglanski, A. W. (1990). Lay epistemic theory in social-cognitive psychology. *Psychological Inquiry, 1*(3), 181-197.

Kruglanski, A. W., Orehek, E., Dechesne, M., & Pierro, A. (2010). Lay epistemic theory: The motivational, cognitive, and social aspects of knowledge formation. *Social and*

Personality Psychology Compass, *4*(10), 939-950.

Kruglanski, A. W., Pierro, A., Mannetti, L., & De Grada, E. (2006). Groups as epistemic providers: Need for closure and the unfolding of group-centrism. *Psychological Review*, *113*(1), 84-100.

Kruglanski, A. W. & Webster, D. M. (1996). Motivated closing of the mind: "Seizing" and "freezing". *Psychological Review, 103*(2), 263-283.

Kruglanski, A. W., Webster, D. M., & Klem, A. (1993). Motivated resistance and openness to persuasion in the presence or absence of prior information. *Attitudes and Social Cognition, 65*(5), 861-876.

Kühnen, U., Van Egmond, M. C., Haber, F., Kuschel, S., Özelsel, A., Rossi, A. L., & Spivak, Y. (2012). Challenge me! Communicating in multicultural classrooms. *Social Psychology of Education*, *15*(1), 59-76.

Kuykendall, J. (2010). Future training innovations. *FLETC Journal, 8*, 9-12.

Lakin, J. L., Jefferis, V. E., Cheng, C. M., & Chartrand, T. L. (2003). The chameleon effect as social glue: Evidence for the evolutionary significance of nonconscious mimicry. *Journal of Nonverbal Behavior, 27*(3), 145-162.

Lakoff, R. (1973). Language and woman's place. *Language in Society*, *2*(1), 45-79.

Lea, M., & Spears, R. (1991). Computer-mediated communication, de-individuation and group decision-making. *International Journal of Man-Machine Studies*, *34*(2), 283-301.

Leaper, C. (2014). Gender similarities and differences. In T. M. Holgraves (Ed.), *The oxford handbook of language and social psychology* (pp. 62-84). Oxford, UK: Oxford University Press.

Lederman, N. G., & Lederman, J. S. (2016). Publishing findings that are not significant: Can non-significant findings be significant? *Journal of Science Teacher Education, 27*(4), 349-355.

Lee, C. (2003). *How does instant messaging affect interaction between the genders?* Stanford, CA: The Mercury Project for Instant Messaging Studies. Retrieved from https://pdfs.semanticscholar.org/0446/268b04e928fb9607d0ed360c31490f8376f3.pdf

Lee, J-E. R. (2014). Does virtual diversity matter? Effects of avatar-based diversity representation on willingness to express offline racial identity and avatar customization. *Computers in Human Behavior, 36*, 190-197.

Leech, G., & Svartvik, J. (1975). *A communicative grammar of English.* Harlow: Longman.

Leippe, M. R. (2016). Reasonable doubt definition effects on judged guilt: Moderation by need for cognition and mediation by changes in required and felt certainty. *Journal of Applied Social Psychology, 46*(5), 302-312.

Leippe, M. R., Manion, A. P., & Romanczyk, A. (1992). Eyewitness persuasion: How and how well do fact finders judge the accuracy of adults' and children's memory reports? *Journal of Personality and Social Psychology, 63*(2), 181-197.

Leshed, G., Hancock, J. T., Cosley, D., McLeod, P. L., & Gay, G. (2007). Feedback for guiding reflection on teamwork practices. In *Proceedings of the 2007 International ACM Conference on Supporting Group Work* (pp. 217-220). ACM.

Levelt, W. J. M., & Kelter, S. (1982). Surface form and memory in question answering. *Cognitive Psychology, 14*, 78-106.

Lewin, K. (1947). Group decision and social change. In T. Newcomb & E. Hartley (Eds.), *Readings in social psychology* (pp. 197-211). New York: Holt.

Lin, H., & Wang, H. (2014). Avatar creation in virtual worlds: Behaviors and motivations. *Computers in Human Behavior, 34*, 213-218.

Lockheed, M. E. (1985). Sex and social influence: A meta-analysis guided by theory. In J. Berger, & M. Zelditch, Jr. (Eds.), *Status, rewards, and influence: How expectations*

organize behavior (pp. 406-429). San Francisco, US: Jossey-Bass.

Loftus, E. F., & Palmer, J. C. (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.

London, H. (1973). *Psychology of the Persuader*. Morristown, N. J.: General Learning Press.

London, H., McSeveney, D., & Tropper, R. (1971). Confidence, overconfidence and persuasion. *Human Relations*, *24*(5), 359-369.

London, H., Meldman, P., & Lanckton, A. (1970a). The jury method: How the persuader persaudes. *Public Opinion Quarterly, 34*(2), 171-183.

London, H., Meldman, P., & Lanckton, A. (1970b). The jury method: Some correlates of persuading. *Human Relations, 23*(2), 115-121.

Lord, C. G., Ross, L., & Lepper, M. R. (1979). Biased assimilation and attitude polarization: The effects of prior theories on subsequently considered evidence. *Journal of Personality and Social Psychology*, *37*(11), 2098-2109.

Maher, B. A. (1992). Delusions: Contemporary etiologic hypotheses. *Psychiatric Annals, 22*(5), 260-268.

Maheswaran, D., & Chaiken, S. (1991). Promoting systematic processing in low motivation settings: Effect of incongruent information on processing and judgment. *Journal of Personality and Social Psychology, 61*, 13-25.

Markman, A. B., & Makin, V. S. (1998). Referential communication and category acquisition. *Journal of Experimental Psychology: General*, *127*(4), 331-354.

Markus, H. (1977). Self-schemata and processing information about the self. *Journal of Personality and Social Psychology, 35*, 63-78.

Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, *98*(2), 224-253.

Martin, G. J., & Yurukoglu, A. (2017). Bias in cable news: Persuasion and

   polarization. *American Economic Review*, *107*(9), 2565-2599.

Martin, N. A., & Brownell, R. (2010). *Expressive one-word picture vocabulary test 4*[th]

   edition (EOWPVT-4). Novato: Academic Therapy Publications.

Maslow, C., Yoselson, K., & London, H. (1971). Persuasiveness of confidence expressed

   via language and body language. *British Journal of Social and Clinical Psychology,*

   10, 234-240.

Matheson, K. (1991). Social cues in computer-mediated negotiations: Gender makes a

   difference. *Computers in Human Behavior, 7*, 137-145.

Mauet, T. A. (2017). *Trial techniques and trials*. New York: Wolters Kluwer.

Mayring, P. (2014). *Qualitative content analysis: Theoretical foundation, basic procedures*

   and software solution. Retrieved from http://nbnresolving.de/urn:nbn:de:0168-ssoar

   395173

McGrath, J. E., & Hollingshead, A. B. (1993). Putting the group back in group support

   systems: Some theoretical issues about dynamic processes in groups with

   technological enhancements. In L. M. Jessup & J. S. Valacich (Eds.), *Group*

   support systems: New perspectives (pp. 78-96). New York: Macmillan.

McGuire, T., Kiesler, S., & Siegal, J. (1987). Group and computer-mediated discussion

   effects in risk decision making. *Journal of Personality and Social Psychology,*

   52(5), 917-930.

McGuire, W. J. (1964). Some contemporary approaches. *Advances in Experimental Social*

   Psychology, *1*, 191-229.

McGuire, W. J., & Papageorgis, D. (1961). The relative efficacy of various types of prior

   belief-defense in producing immunity against persuasion. *The Journal of Abnormal*

   and Social Psychology, *62*(2), 327-337.

McKenna, K. Y., Green, A. S., & Gleason, M. E. (2002). Relationship formation on the

Internet: What's the big attraction? *Journal of Social Issues*, *58*(1), 9-31.

McLeod, P. L. (2000). Anonymity and consensus in computer-supported group decision making. *Research on Managing Groups and Teams*, *3,* 175-204.

McLeod, P. L., & Elston, S. E. (1995). Persuasive linguistic devices in anonymous vs identified computer supported groups: An exploratory study. In *Proceedings of 28th International Conference on System Sciences*, 163-170.

McMahan, A. (2003). Immersion, engagement and presence: A method for analyzing 3-D video games. In M. Wolf, & B. Perron (Eds.), *The video game theory reader* (pp. 67- 86). Oxon: Routledge.

Menenti, L., Pickering, M. J., & Garrod, S. C. (2012). Toward a neural basis of interactive alignment in conversation. *Frontiers in Human Neuroscience, 6,* 1-9.

Miller, C. H., Lane, L. T., Deatrick, L. M., Young, A. M., & Potts, K. A. (2007). Psychological reactance and promotional health messages: The effects of controlling language, lexical concreteness, and the restoration of freedom. *Human Communication Research*, *33*(2), 219-240.

Minkov, M. (2018). A revision of Hofstede's model of national culture: Old evidence and new data from 56 countries. *Cross Cultural & Strategic Management*, *25*(2), 231-256.

Mohammadi, G., Park, S., Sagae, K., Vinciarelli, A., & Morency, L-P. (2013). Who is persuasive? The role of perceived personality and communication modality in social multimedia. In *Proceedings of the 15th ACM on International conference on multimodal interaction* (pp. 19-26). ACM.

Moore, M. J., Nakano, T., Enomoto, A., & Suda, T. (2012). Anonymity and roles associated with aggressive posts in an online forum. *Computers in Human Behavior*, *28*(3), 861-867.

Morina, N., Ijntema, H., Meyerbröker, K., & Emmelkamp, P. M. (2015). Can virtual reality exposure therapy gains be generalized to real-life? A meta-analysis of studies applying behavioral assessments. *Behaviour research and therapy*, *74*, 18-24.

Moritz, S., Voigt, M., Kother, U., Leighton, L., Kjahili, B., Babur, Z., Jungclaussen, D., Veckenstedt, R., & Grzella, K. (2014). Can virtual reality reduce reality distortion? Impact of performance feedback on symptom change in schizophrenia patients. *Journal of Behavior Therapy and Experimental Psychiatry, 45*(2), 267-271.

Moritz, S., & Woodward, T. S. (2006). A generalized bias against disconfirmatory evidence in schizophrenia. *Psychiatry Research*, *142*(2-3), 157-165.

Moutoussis, M., Bentall, R. P., El-Deredy, W., & Dayan, P. (2011). Bayesian modelling of jumping-to-conclusions bias in delusional patients. *Cognitive Neuropsychiatry*, *16*(5), 422-447.

Mulac, A., Bradac, J. J., & Gibbons, P. (2001). Empirical support for the gender-as-culture hypothesis: An intercultural analysis of male/female language differences. *Human Communication Research*, *27*(1), 121-152.

Mulac, A., & Lundell, T. L. (1986). Linguistic contributors to the gender-linked language effect. *Journal of Language and Social Psychology*, *5*(2), 81-101.

Mulac, A., Wiemann, J. M., Widenmann, S. J., & Gibson, T. W. (1988). Male/female language differences and effects in same-sex and mixed-sex dyads: The gender linked language effect. *Communications Monographs*, *55*(4), 315-335.

Muscanell, N. L. (2009). *Computer-mediated persuasion: Emoticons as a proxy for nonverbal behavior* (Doctoral thesis). Retrieved from The University of Alabama.

NatCen Social Research (2017). Religion. In *British Social Attitudes, 28* (pp. 173-184). Retrieved from http://www.bsa.natcen.ac.uk/latest-report/british-social-attitudes 28/religion.aspx

Newman, M. L., Groom, C. J., Handelman, L. D., & Pennebaker, J. W. (2008). Gender differences in language use: An analysis of 14,000 text samples. *Discourse Processes, 45*(3), 211-236.

Ng, S. H., & Bradac, J. J. (1993). *Power in language: Verbal communication and social influence.* California: SAGE Publications.

Nguyen, M., Bin, Y. S., & Campbell, A. (2012). Comparing online and offline self-disclosure: A systematic review. *Cyberpsychology Behavior and Social Networking, 15*(2), 103-111.

Niederhoffer, K. G., & Pennebaker, J. W. (2002). Linguistic style matching in social interaction. *Journal of Language and Social Psychology, 21*(4), 337-360.

Nisbett, R. E., Choi, I., Peng, K., & Norenzayan, A. (2001). Culture and systems of thought: Holistic versus analytic cognition. *Psychological Review, 108*(2), 291-310.

Nisbett, R. E., & Masuda, T. (2003). Culture and point of view. In *Proceedings of the National Academy of Sciences, 100*(19), 11163-11170.

Nisbett, R. E., & Miyamoto, Y. (2005). The influence of culture: Holistic versus analytic perception. *Trends in Cognitive Sciences, 9*(10), 467-473.

Nisbett, R. E., & Ross, L. (1980). *Human inference: Strategies and shortcomings of social judgment.* Englewood Cliffs, NJ: Prentice-Hall.

Nisbett, R. E., & Wilson, T. D. (1977). The halo effect: Evidence for unconscious alteration of judgments. *Journal of Personality and Social Psychology, 35*(4), 250-256.

Nowak, K. L., & Fox, J. (2018). Avatars and computer-mediated communication: A review of the definitions, uses, and effects of digital representations. *Review of Communication Research, 6*, 30-53.

Nowak, K. L., Watt, J., & Walther, J. B. (2009). Computer mediated teamwork and the efficiency framework: Exploring the influence of synchrony and cues on media

satisfaction and outcome success. *Computers in Human Behavior, 25*(5), 1108-1119.

Nye, J. S. (2004). *Soft power: The means to success in world politics.* New York: Public Affairs.

Office for National Statistics (2011). *Ethnicity and national identity in England and Wales: 2011.* Retrieved from

https://www.ons.gov.uk/peoplepopulationandcommunity/culturalidentity/ethnicity/articles/ethnicityandnationalidentityinenglandandwales/2012-12-11

Okamura, J. Y. (1981) Situational ethnicity. *Ethnic and Racial Studies, 4*(4), 452-465.

Okdie, B. M., Guadagno, R. E., Bernieri, F. J., Geers, A. L., & Mclarney-Vesotski, A. R. (2011). Getting to know you: Face-to-face versus online interactions. *Computers in Human Behavior*, *27*(1), 153-159.

O'Keefe, D. J. (2008). Elaboration likelihood model. In W. Donsbach (Ed.), *The international encyclopedia of communication* (pp. 1475-1480). Oxford: Blackwell Publishing.

Olsen, W. (2004). Triangulation in social research: Qualitative and quantitative methods can really be mixed. In M. Holborn (Ed.), *Developments in sociology: An annual review* (pp. 103-118). Ormskirk: Causeway Press.

Oyserman, D., Coon, H. M., & Kemmelmeier, M. (2002). Rethinking individualism and collectivism: Evaluation of theoretical assumptions and meta-analyses. *Psychological Bulletin, 128*(1), 3-72.

Paese, P. W., & Kinnaly, M. (1993). Peer input and revised judgment: Exploring the effects of (un) biased confidence. *Journal of Applied Social Psychology*, *23*(23), 1989-2011.

Palomares, N. A., & Lee, E. J. (2010). Virtual gender identity: The linguistic assimilation to gendered avatars in computer-mediated communication. *Journal*

of Language and Social Psychology, 29(1), 5-23.

Pardo, J. S. (2006). On phonetic convergence during conversational interaction. *The*

Journal of the Acoustical Society of America, *119*(4), 2382-2393.

Park, R. E., & Burgess, E. W. (1924). *Introduction to the science of sociology*. Chicago:

University of Chicago Press.

Parker, A. (May, 2018). *Director General Andrew Parker speech to BFV Symposium*,

Berlin. Retrieved from https://www.mi5.gov.uk/news/director-general-andrew-

parker-speech-to-bfv-symposium

Parton, S. R., Siltanen, S. A., Hosman, L. A., & Lagenderfer, J. (2002). Employment

interview outcomes and speech style effects. *Journal of Language and Social*

Psychology, 21(2), 144-161.

Patterson, M. L. (1982). A sequential functional model of nonverbal exchange.

Psychological Review, 89(3), 231-249.

Pennebaker, J. W., Booth, R. J., Boyd, R. L., & Francis, M. E. (2015). *Linguistic inquiry*

and word count: LIWC2015 operator's manual. Austin, TX: Pennebaker

Conglomerates.

Pennebaker, J. W., Booth, R. J., & Francis, M. E. (2007). *Linguistic inquiry and word*

count: LIWC2007 operator's manual. Austin, TX: Pennebaker Conglomerates.

Pennebaker, J. W., Boyd, R. L., Jordan, K., & Blackburn, K. (2015). *The development and*

psychometric properties of LIWC2015. Austin, TX: Pennebaker Conglomerates.

Pennebaker, J. W., Chung, C. K., Frazee, J., Lavergne, G. M., & Beaver, D. I. (2014).

When small words foretell academic success: The case of college admissions

essays. *PloS ONE, 9*(12), Article ID: e115844.

Pennebaker, J., Chung, C., Ireland, M., Gonzales, A., & Booth, R. (2007). *The*

development and psychometric properties of LIWC2007. Austin, TX: Pennebaker

Conglomerates.

Pennebaker, J. W., Francis, M. E., & Booth, R. J. (2001). *Linguistic inquiry and word count: LIWC2001.* Mahwah, NJ: Erlbaum Publishers.

Pennebaker, J. W., & King, L. A. (1999). Linguistic styles: Language use as an individual difference. *Journal of Personality and Social Psychology*, 77(6), 1296-1312.

Pennebaker, J. W., Mehl, M. R., & Niederhoffer, K. G. (2003). Psychological aspects of natural language use: Our words, our selves. *Annual Review of Psychology, 54*(1), 547-577.

Pennycook, G., Cheyne, J. A., Seli, P., Koehler, D. J., & Fugelsang, J. A. (2012). Analytic cognitive style predicts religious and paranormal belief. *Cognition, 123*(3), 335 -346.

Perloff, R. M. (2003). *The dynamics of persuasion. Communication and attitudes in the 21st century.* Mahwah: Lawrence Erlbaum.

Peters, E., Day, S., Mckenna, J., & Orbach, G. (1999). Delusional ideation in religious and psychotic populations. *The British Journal of Clinical Psychology, 38*, 83-96.

Peters, E., & Garety, P. (2006). Cognitive functioning in delusions: A longitudinal analysis. *Behavior Research and Therapy, 44*(4), 481-514.

Peters, E., Joseph, S., Day, S., & Garety, P. (2004). Measuring delusional ideation: The 21-item Peters et al. delusions inventory (PDI). *Schizophrenia Bulletin, 30*(4), 1005 -1022.

Peters, E. R., Joseph, S. A., & Garety, P. A. (1999). Measurement of delusional ideation in the normal population: Introducing the PDI (Peters et al. delusions inventory). *Schizophrenia Bulletin, 25*(3), 553-576.

Peters, E. R., Thornton, P., Siksou, L., Linney, Y., & MacCabe, J. H. (2008). Specificity of the jump-to-conclusions bias in deluded patients. *British Journal of Clinical Psychology, 47*(2), 239-244.

Petty, R. E. (1977). *A cognitive response analysis of the temporal persistence of attitude changes induced by persuasive communications* (Doctoral dissertation). Retrived from Ohio State University, Columbus.

Petty, R. E. (1994). Two routes to persuasion: State of the art. *International Perspectives in Psychological Science, 2,* 229-247.

Petty, R. E., & Briñol, P. (2015). Processes of social influence through attitude change. In M. Mikulincer., P. R. Shaver., E. Borgida., & J. A. Bargh (Eds.), *APA handbook of personality and social psychology. Volume 1: Attitudes and social cognition* (pp. 509-545). New York: APA.

Petty, R. E., Briñol, P., Teeny, J., & Horcajo, J. (2018). The elaboration likelihood model: Changing attitudes toward exercising and beyond. In B. Jackson, J. Dimmock, & J. Compton (Eds.), *Persuasion and communication in sport, exercise, and physical activity* (pp. 22-37). New York: Routledge.

Petty, R. E., Briñol, P., & Tormala, Z. L. (2002). Thought confidence as a determinant of persuasion: The self-validation hypothesis. *Journal of Personality and Social Psychology, 82*(5), 722-741.

Petty, R. E., & Cacioppo, J. (1979). Issue involvement can increase or decrease persuasion by enhancing message-relevant cognitive responses. *Journal of Personality and Social Psychology, 37*(10), 1915-1926.

Petty, R. E., & Cacioppo, J. T. (1984). The effects of involvement on responses to argument quantity and quality: Central and peripheral routes to persuasion. *Journal of Personality and Social Psychology, 46*(1), 69-81.

Petty, R. E., & Cacioppo, J. T. (1986a). *Communication and persuasion: Central and peripheral routes to attitude change*. New York: Springer-Verlag.

Petty, R. E., & Cacioppo, J. T. (1986b). The elaboration likelihood model of persuasion. *Advances in Experimental Social Psychology, 19*, 123-205.

Petty, R. E., & Cacioppo, J. T. (2012). *Communication and persuasion: Central and peripheral routes to attitude change*. New York: Springer Verlag.

Petty, R. E., Cacioppo, J., & Goldman, R. (1981). Personal involvement as a determinant of argument-based persuasion. *Journal of Personality and Social Psychology, 41*(5), 847-855.

Petty, R. E., Cacioppo, J. T., & Schumann, D. (1983). Central and peripheral routes to advertising effectiveness: The moderating role of involvement. *Journal of Consumer Research*, *10*(2), 135-146.

Petty, R. E., Kasmer, J. A., Haugtvedt, C. P., & Cacioppo, J. T. (1987). Source and message factors in persuasion: A reply to Stiff's critique of the elaboration likelihood model. *Communication Monographs, 54,* 232-249.

Petty, R. E., & Wegner, D. T. (1999). The elaboration likelihood model: Current status and controversies. In S. Chaiken, & Y. Trope (Eds.), *Dual-process theories in social psychology* (pp. 41-72). New York: Guilford Press.

Pew Research Center (2015). *Social media usage: 2005-2015*. Retrieved from http://www.pewinternet.org/2015/10/08/social-networking-usage-2005-2015/

Pfau, M., Holbert, R. L., Zubric, S. J., Pasha, N. H., & Lin, W. K. (2000). Role and influence of communication modality in the process of resistance to persuasion. *Media Psychology*, *2*(1), 1-33.

Pickering, M. J., & Garrod, S. (2004). The interactive-alignment model: Developments and refinements. *Behavioral and Brain Sciences*, *27*(2), 212-225.

Pickering, M. J., & Garrod, S. (2006). Alignment as the basis for successful communication. *Research on Language and Computation*, *4*(2-3), 203-228.

Pierro, A., Mannetti, L., Kruglanski, A. W., & Sleeth-Keppler, D. (2004). Relevance override: On the reduced impact of "cues" under high-motivation conditions of persuasion studies. *Journal of Personality and Social Psychology*, *86*(2), 251-264.

Pietrzak, J., Jochemczyk, Ł., Serbin, P., & Kuśka, M. (2014). The influence of need for closure on expectations about and outcomes of negotiations. *Polish Psychological Bulletin, 45*(3), 286-295.

Piliavin, J. A., & Martin, R. R. (1978). The effects of the sex composition of groups on style of social interaction. *Sex Roles*, *4*(2), 281-296.

Pillon, A., Degauquier, C., & Duquesne, F. (1992). Males' and females' conversational behavior in cross-sex dyads: From gender differences to gender similarities. *Journal of Psycholinguistic Research*, *21*(3), 147-172.

Posner, M. I. (1973). *Cognition: An introduction.* Oxford: Scott Foresman.

Postmes, T., & Spears, R. (2002). Behaviour online: Does anonymous computer communication reduce gender inequality? *Personality and Social Psychology Bulletin, 28*(7), 1073-1083.

Postmes, T., Spears, R., Sakhel, K., & De Groot, D. (2001). Social influence in computer-mediated communication: The effects of anonymity on group behavior. *Personality and Social Psychology Bulletin*, *27*(10), 1243-1254.

Poulton, R., Caspi, A., Moffitt, T. E., Cannon, M., Murray, R., & Harrington, H. (2000). Children's self-reported psychotic symptoms and adult schizophreniform disorder: A 15-year longitudinal study. *Archives of General Psychiatry*, *57*(11), 1053-1058.

Prentice, S., & Taylor, P. J. (2018). Psychological and behavioral examinations of online terrorism. In J. M. McAlaney., L. A. Frumkin, & V. Benson (Eds.), *Psychological and behavioral examinations in cyber security* (pp. 151-171). Hershey, PA: IGI Global.

Price, P. C., & Stone, E. R. (2004). Intuitive evaluation of likelihood judgment producers: Evidence for a confidence heuristic. *Journal of Behavioral Decision Making, 17*(1), 39-57.

Propp, K. M. (1995). An experimental examination of biological sex as a status cue in decision-making groups and its influence on information use. *Small Group Research*, *26*(4), 451-474.

Pulford, B. D., Colman, A. M., Buabang, E. K., & Krockow, E. M. (2018). The persuasive power of knowledge: Testing the confidence heuristic. *Journal of Experimental Psychology: General, 147*(10), 1431-1444.

Pyszczynski, T., & Greenberg, J. (1987). Toward an integration of cognitive and motivational perspectives on social inference: A biased hypothesis-testing model. *Advances in Experimental Social Psychology*, *20,* 297-340.

Quick, B. L., & Considine, J. R. (2008). Examining the use of forceful language when designing exercise persuasive messages for adults: A test of conceptualizing reactance arousal as a two-step process. *Health Communication*, *23*(5), 483-491.

Quick, B. L., & Stephenson, M. T. (2008). Examining the role of trait reactance and sensation seeking on perceived threat, state reactance, and reactance restoration. *Human Communication Research*, *34*(3), 448-476.

Quirk, R., Greenbaum, S., Leech, G., & Svartvik, J. (1985). *A comprehensive grammar of the English language*. Harlow: Longman.

Rains, S. A. (2007). The impact of anonymity on perceptions of source credibility and influence in computer-mediated group communication. A test of two competing hypotheses. *Communication Research, 34*(1), 100-125.

Rains, S. A., & Turner, M. M. (2007). Psychological reactance and persuasive health communication: A test and extension of the intertwined model. *Human Communication Research*, *33*(2), 241-269.

Rancer, A. S., & Avtgis, T. A. (2006). *Argumentative and aggressive communication: Theory, research, and application*. California: SAGE Publications.

Raymer, K., & Harris, L. (2017). Online information and fake news. *Parliamentary Office of Science and Technology* (POSTnote 559). Retrieved from https://researchbriefings.parliament.uk/ResearchBriefing/Summary/POST-PN-0559?utm_source=website&utm_campaign=PN559

Reardon, K. K. (1991). *Persuasion in practice.* Newbury Park, CA: SAGE Publications.

Reed Jones, J. (2011). *Prediction and prevention of simulator sickness: An examination of individual differences, participant behaviours, and controlled interventions* (Doctoral thesis). Retrieved from The University of Guelph.

Reinig, B. A., & Mejias, R. J. (2004). The effects of national culture and anonymity on flaming and criticalness in GSS-supported discussions. *Small Group Research*, *35*(6), 698-723.

Richardson, B. H., Taylor, P. J., Snook, B., Conchie, S. M., & Bennell, C. (2014). Language style matching and police interrogation outcomes. *Law and Human Behaviour, 38*(4), 357-366.

Richter, L., & Kruglanski, A. W. (2004). Motivated closed mindedness and the emergence of culture. In M. Schaller, & C. S. Crandall (Eds.), *The psychological foundations of culture* (pp. 101-122). Mahwah, NJ: Lawrence Erlbaum Associates.

Rizzo, A., Difede, J., Rothbaum, B. O., Daughtry, J. M., & Reger, G. (2013a). Virtual reality as a tool for delivering PTSD exposure therapy. *Post-Traumatic Stress Disorder: Future Directions in Prevention, Diagnosis, and Treatment*, 1-22.

Rizzo, A., Forbell, E., Lange, B., Buckwalter, J. G., Williams, J., Sagae, K., & Traum, D. (2013b). SimCoach: An online intelligent virtual human agent system for breaking down barriers to care for service members and veterans. In R. M. Scurfield, & K. T. Platoni (Eds.), *Healing war trauma: A handbook of creative approaches* (pp. 238-250). New York: Routledge.

Rizzo, A., Hartholt, A., Grimani, M., Leeds, A., & Liewer, M. (2014). Virtual reality

exposure therapy for combat-related posttraumatic stress disorder.
Computer, *47*(7), 31-37.

Rizzo, A., Parsons, T. D., Lange, B., Kenny, P., Buckwalter, J. G., Rothbaum, B., Difede, J., Frazier, J., Newman, B., Williams, J., & Reger, G. (2011). Virtual reality goes to war: A brief review of the future of military behavioral healthcare. *Journal of Clinical Psychology in Medical Settings, 18*(2), 176-187.

Roets, A., Van Hiel, A., & Cornelis, I. (2006). The dimensional structure of the need for cognitive closure scale: Relationships with "seizing" and "freezing" processes. *Social Cognition*, *24*(1), 22-45.

Romero, D. M., Uzzi, B., & Kleinberg, J. (2016). Social networks under stress. In *Proceedings of the 25th International Conference on World Wide Web* (pp. 9-20). International World Wide Web Conferences Steering Committee, Quebec, Canada.

Roskos-Ewoldsen, D. R., Bichsel, J., & Hoffman, K. (2002). The influence of accessibility of source likability on persuasion. *Journal of Experimental Social Psychology*, *38*(2), 137-143.

Roskos-Ewoldsen, D. R., & Fazio, R. H. (1992). The accessibility of source likability as a determinant of persuasion. *Personality and Social Psychology Bulletin*, *18*(1), 19-25.

Ross, E. A. (1908). *Social psychology: An outline and a sourcebook.* New York: Macmillan.

Ross, R. M., Pennycook, G., McKay, R., Gervais, W. M., Langdon, R., & Coltheart, M. (2016). Analytic cognitive style, not delusional ideation, predicts data gathering in a large beads task study. *Cognitive Neuropsychiatry, 21*(4), 300-314.

Rubin, V. L. (2010). Epistemic modality: From uncertainty to certainty in the context of information seeking as interactions with texts. *Information Processing & Management, 46*(5), 533-540.

Russell, M. B. (2015). *The Middle East and South Asia. The world today series 2015-2016.* Lanham, MD: Rowman & Littlefield.

Sandham, A., Ormerod, T. C., Dando, C. J., & Menacere, T. (2015). On the trail of the terrorist: A research environment to simulate criminal investigations. In G. Lawson, & A. Stedmon (Eds.), *Hostile intent and counter-terrorism: Human factors theory and application* (pp. 129-148). New York: Routledge.

Sassenberg, K., & Postmes, T. (2002). Cognitive and strategic processes in small groups: Effects of anonymity of the self and anonymity of the group on social influence. *British Journal of Social Psychology*, *41*(3), 463-480.

Savicki, V., Lingenfelter, D., & Kelley, M. (1996). Gender language style and group composition in internet discussion groups. *Journal of Computer-Mediated Communication*, *2*(3), JCMC232.

Scherer, C. R., & Sagarin, B. J. (2006). Indecent influence: The positive effects of obscenity on persuasion. *Social Influence, 1*(2), 138-146.

Schwartz, S. H. (2012). An overview of the Schwartz theory of basic values. *Online Readings in Psychology and Culture, 2*(1). Retrieved from https://doi.org/10.9707/23070919.1116

Scissors, L. E., Gill, A. J., Geraghty, K., & Gergle, D. (2009). In CMC we trust: The role of similarity. In *CHI 2009: Digital Life New World - Proceedings of the 27th International Conference on Human Factors in Computing Systems* (pp. 527-536).

Sedikides, C., & Skowronski, J. J. (1991). The law of cognitive structure activation. *Psychological Inquiry, 2*(2), 169-184.

Setlock, L., Fussell, S., & Neuwirth, C. (2004). Taking it out of context: Collaborating within and across cultures in face-to-face settings and via instant messaging. In *Proceedings of the 2004 ACM conference on computer supported cooperative work*, 604-613. ACM.

Setlock, L. D., Quinones, P. A., & Fussell, S. R. (2007). Does culture interact with media richness? The effects of audio vs. video conferencing on Chinese and American dyads. In *Proceedings of the 40th Annual Hawaii International Conference on System Sciences*. Hawaii, US: IEEE.

Shafer, D. M., Carbonara, C. P., & Korpi, M. F. (2017). Modern virtual reality technology: Cybersickness, sense of presence, and gender. *Media Psychology Review, 11*(2), 1-13.

Sharpe, D. (2015). Your chi-square test is statistically significant: Now what? *Practical Assessment, Research and Evaluation, 20*(8), 1-10.

Shavitt, S., & Brock, T. C. (1994). *Persuasion: Psychological insights and perspectives*. MA: Allyn and Bacon.

Shen, F., Sheer, V. C., & Li, R. (2015). Impact of narratives on persuasion in health communication: A meta-analysis. *Journal of Advertising*, *44*(2), 105-113.

Siegel, J., Dubrovsky, V., Kiesler, S., & McGuire, T. W. (1986). Group processes in computer-mediated communication. *Organizational Behavior and Human Decision Processes*, *37*(2), 157-187.

Silverthorne, C. P. (1971). Information input and the group shift phenomenon in risk -taking. *Journal of Personality and Social Psychology, 20*(3), 456-461.

Skalski, P., & Tamborini, R. (2004). Social presence and information processing: An application of the heuristic-systematic model of persuasion. In *Proceedings of the 2004 annual conference of the National Communication Association*, Chicago, IL.

Skalski, P., & Tamborini, R. (2007). The role of social presence in interactive agent-based persuasion. *Media Psychology, 10*(3), 385-413.

Smith, M. J. (1982). *Persuasion and human action: A review and critique of social influence theories.* Belmont, CA: Wadsworth.

Sniezek, J. A., & Van Swol, L. M. (2001). Trust, confidence, and expertise in a judge

advisor system. *Organizational behavior and human decision processes*, *84*(2), 288-307.

Sparks, J. R., & Areni, C. S. (2002). The effects of sales presentation quality and initial perceptions on persuasion: A multiple role perspective. *Journal of Business Research*, *55*(6), 517-528.

Sparks, J. R., & Areni, C. S. (2008). Style versus substance: Multiple roles of language power in persuasion. *Journal of Applied Social Psychology*, *38*(1), 37-60.

Sparks, J. R., Areni, C. S., & Cox, K. C. (1998). An investigation of the effects of language style and communication modality on persuasion. *Communications Monographs*, *65*(2), 108-125.

Speechley, W. J., Whitman, J. C., & Woodward, T. S. (2010). The contribution of hypersalience to the "jumping to conclusions" bias associated with delusions in schizophrenia. *Journal of Psychiatry & Neuroscience, 35*(1), 7-17.

Stanney, K. M., & Kennedy, R. S. (2009). Simulation sickness. In D. A. Vincenzi, J. A. Wise, M. Mouloua, & P. A. Hancock (Eds.), *Human factors in simulation and Training* (pp. 117-128). Boca Raton: CRC Press.

Stanney, K. M., Kingdon, K. S., Graeber, D., & Kennedy, R. S. (2002). Human performance in immersive virtual environments: Effects of exposure duration, user control, and scene complexity. *Human Performance, 15*(4), 339-366.

Statista (2018a). *Forecast augmented (AR) and virtual reality (VR) market size worldwide from 2016 to 2022 (in billion U.S. dollars).* Retrieved from https://www.statista.com/statistics/591181/global-augmented-virtual-reality-market-size/

Statista (2018b). Which services do you use most on your mobile phine for messaging? Retreived from https://www.statista.com/statistics/279605/most-used-instant-messaging-services-on-mobile-phones/

Stayman, D. M., & Deshpande, R. (1989). Situational ethnicity and consumer behavior. *Journal of Consumer Research, 16*(3), 361-371.

Stewart, C. O., Setlock, L. D., & Fussell, S. R. (2007). Conversational argumentation in decision making: Chinese and U.S. participants in face-to-face and instant messaging interactions. *Discourse Processes, 44*(2), 113-139.

Stiff, J. B. (1986). Cognitive processing of persuasive message cues: A meta-analytic review of the effects of supporting information on attitudes. *Communication Monographs, 53*, 75-89.

Stiff, J. B., & Mongeau, P. A. (2016). *Persuasive communication*. New York: The Guilford Press.

Straus, S. G., & McGrath, J. E. (1994). Does the medium matter? The interaction of task type and technology on group performance and member reactions. *Journal of Applied Psychology*, *79*(1), 87-97.

Suh, K. S. (1999). Impact of communication medium on task performance and satisfaction: An examination of media-richness theory. *Information & Management*, *35*(5), 295-312.

Suh, A., & Prophet, J. (2018). The state of immersive technology research: A literature analysis. *Computers in Human Behavior, 86*, 77-90.

Suler, J. 2004. The online disinhibition effect. *Cyberpsychology and Behavior, 7*, 321-326.

Taffou, M., E., Chapoulie, A., Guerchouche, D. R., Drettakis, G., & Viaud- Delmon, I. (2012). Auditory-visual integration of emotional signals in a virtual environment for cynophobia. *Annual Review of Cybertherapy and Telemedicine: Advanced Technologies in the Behavioral, Social and Neurosciences, 181,* 238-242.

Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. In W. G. Austin & S. Worchel (Eds.), *The social psychology of intergroup relations* (pp. 33-47). Monterey, CA: Brooks/Cole.

Tang, K. L., & Algina, J. (1993). Performance of four multivariate tests under variance covariance heteroscedasticity. *Multivariate Behavioral Research*, *28*(4), 391-405.

Tausczik, Y. R., & Pennebaker, J. W. (2010). The psychological meaning of words: LIWC and computerized text analysis methods. *Journal of Language and Social Psychology*, *29*(1), 24-54.

Tausczik, Y. R., & Pennebaker, J. W. (2013). Improving teamwork using real-time language feedback. *In CHI 2013: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 459-468). ACM.

Taylor, D. A., & Dando, C. J. (2018). Eyewitness memory in face-to-face and immersive avatar-to-avatar contexts. *Frontiers in Psychology, 9*(507), 1-11.

Taylor, P. J., Dando, C. J., Ormerod, T. C., Ball, L. J., Jenkins, M. C., Sandham, A., & Menacere, T. (2013). Detecting insider threats through language change. *Law and Human Behaviour, 37*(4), 267-275.

Taylor, P. J., Larner, S., Conchie, S. M., & Menacere, T. (2017). Culture moderates changes in linguistic self-presentation and detail provision when deceiving others. *Royal Society Open Science*, *4*(6), 170128.

Taylor, P. J., & Thomas, S. (2008). Linguistic style matching and negotiation outcome. *Negotiation and Conflict Management Research*, *1*(3), 263-281.

Taylor, P. M. (2003). *Munitions of the mind: A history of propaganda from the ancient world to the present day* (3rd edition). Manchester, UK: Manchester University Press.

Taylor, T. L. (2002). Living digitally: Embodiment in virtual worlds. In R. Schroeder (Ed.), *The social life of avatars: Presence and interaction in shared virtual environments* (pp. 40–62). London: Springer-Verlag.

Teigen, K. H. (1990). To be convincing or right: A question of preciseness. In K. Gilhooly, M. Keane, R. Logan and G. Erdos (Eds.), *Lines of thinking: Reflections on the*

psychology of thought (pp. 399-414). Chichester: Wiley.

Tesser, A., & Conlee, M. C. (1975). Some effects of time and thought on attitude polarization. *Journal of Personality and Social Psychology*, *31*(2), 262-270.

Teteris, E., Fraser, K., Wright, B., & McLaughlin, K. (2012). Does training learners on simulators benefit real patients? *Advances in Health Sciences Education, 17*(1), 137-144.

Thayer, S. E., & Ray, S. (2006). Online communication preferences across age, gender, and duration of Internet use. *CyberPsychology & Behavior, 9*(4), 432-440.

Thomas, J. P., & McFadyen, R. G. (1995). The confidence heuristic: A game-theoretic analysis. *Journal of Economic Psychology*, *16*(1), 97-113.

Tickle-Degnen, L., & Rosenthal, R. (1987). Group rapport and nonverbal behavior. In C. Hendrick (Ed.), *Review of personality and social psychology, Vol. 9. Group processes and intergroup relations* (pp. 113-136). Thousand Oaks, CA, US: SAGE Publications.

Tickle-Degnen, L., & Rosenthal, R. (1990). The nature of rapport and its nonverbal correlates. *Psychological Inquiry*, *1*(4), 285-293.

Tormala, Z. L., Clarkson, J. J., & Petty, R. E. (2006). Resisting persuasion by the skin of one's teeth: The hidden success of resisted persuasive messages. *Journal of Personality and Social Psychology, 91*(3), 423-435.

Tormala, Z. L., & Petty, R. E. (2002). What doesn't kill me makes me stronger: The effects of resisting persuasion on attitude certainty. *Journal of Personality and Social Psychology, 83*(6), 1298-1313.

Tormala, Z. L., & Petty, R. E. (2004). Resistance to persuasion and attitude certainty: The moderating role of elaboration. *Personality and Social Psychology Bulletin, 30*(11), 1446-1457.

Torrance, M., & Galbraith, D. (2006). The processing demands of writing. In C.

MacArthur, S. Graham, & J. Fitzgerlad (Eds.), *Handbook of writing research* (pp. 67-80). New York: Guilford Publications.

Tranter, C., & Hobbs, A. (2017). Migrants and housing. *Parliamentary Office of Science and Technology* (POSTnote 560). Retrieved from https://researchbriefings.parliament.uk/ResearchBriefing/Summary/POST-PN-0560

Triandis, H. C. (1989). The self and social behavior in differing cultural contexts. *Psychological Review, 96*(3), 506-520.

Triandis, H. C. (2001). Individualism-collectivism and personality. *Journal of Personality, 69*(6), 907-924.

Trope, Y., & Gaunt, R. (1999). A dual-process model of overconfident attributional inferences. In S. Chaiken, & Y. Trope (Eds.), *Dual-process theories in social psychology* (pp. 161-178). New York: The Guilford Press.

Tulving, E., & Pearlstone, Z. (1966). Availability versus accessibility of information in memory for words. *Journal of Verbal Learning and Verbal Behavior*, *5*(4), 381-391.

Usoh, M., Alberto, C., & Slater, M. (1996). *Presence: Experiments in the psychology of virtual environments*. Retrieved from http://www8.cs.umu.se/kurser/TDBD12/VT06/articles/precense-paper-teap_full96.pdf

van der Gaag, M. (2006). A neuropsychiatric model of biological and psychological processes in the remission of delusions and auditory hallucinations. *Schizophrenia Bulletin*, *32*(1), 113-122.

Varnum, M. E. W., Grossmann, I., Katunar, D., Nisbett, R. E., & Kitayama, S. (2008). Holism in a european cultural context: Differences in cognitive style between central and east europeans and westerners. *Journal of Cognition and Culture, 8*(3), 321–333.

Varnum, M. E. W., Grossmann, I., Kitayama, S., & Nisbett, R. E. (2010). The origin of cultural differences in cognition: The social orientation hypothesis. *Current Directions in Psychological Science*, *19*(1), 9-13.

Verkuyten, M. (2018). *The social psychology of ethnic identity*. London: Routledge.

Vinokur, A., & Burnstein, E. (1974). Effects of partially shared persuasive arguments on group-induced shifts: A group problem solving approach. *Journal of Personality and Social Psychology, 29*(3), 305-315.

Viola, V., Tosoni, A., Brizi, A., Salvato, I., Kruglanski, A. W., Galati, G., & Mannetti, L. (2015). Need for cognitive closure modulates how perceptual decisions are affected by task difficulty and outcome relevance. *PloS ONE, 10*(12), Article ID e0146002.

Walther, J. B. (1996). Computer-mediated communication: Impersonal, interpersonal, and hyperpersonal interaction. *Communication Research, 23*, 3-43.

Walther, J. B. (2011). Theories of computer-mediated communication and interpersonal relations. In M. L. Knapp & J. A. Daly (Eds.), *The handbook of interpersonal communication* (Vol. 4, pp. 443-479). California: SAGE Publications.

Wang, Z-C., Tsai, C-C., & Chien, M-C. (2012). Design of an intelligent soldier combat training system. *International Journal of Automation and Smart Technology, 2*(4), 309-317.

Webster, D. M., & Kruglanski, A. W. (1994). Individual differences in need for cognitive closure. *Personality and Individual Differences, 67*(6), 1049-1062.

Webster, D. M., & Kruglanski, A. W. (1997). Cognitive and social consequences of the need for cognitive closure. *European Review of Social Psychology, 8*(1), 133-173.

Weisband, S., & Atwater, L. (1999). Evaluating self and others in electronic and face-to-face groups. *Journal of Applied Psychology*, *84*(4), 632-639.

Wells, G. L., Small, M., Penrod, S., Malpass, R. S., Fulero, S. M., & Brimacombe, C. A. E. (1998). Eyewitness identification procedures: Recommendations for lineups and photospreads. *Law and Human Behavior*, *22*(6), 603-647.

Wesson, C. J. (2005). *The communication and influence of confidence and uncertainty* (Doctoral thesis). Retrieved from University of Wolverhampton.

Wesson, C. J., & Pulford, B. D. (2009). Verbal expressions of confidence and doubt. *Psychological Reports*, *105*(1), 151-160.

Westney, P. (1986). How to be more or less certain in English: Scalarity in epistemic modality. *International Review of Applied Linguistics in Language Teaching, 24*(4), 311-320.

Whitley Jr, B. E. (1987). The effects of discredited eyewitness testimony: A meta analysis. *The Journal of Social Psychology*, *127*(2), 209-214.

Wilson, C. (2008). Avatars, virtual reality technology, and the US military: Emerging policy issues*. Congressional Research Service*. Washington, DC: The Library of Congress.

Wilson, D. W., Jenkins, J., Twyman, N., Jensen, M., Valacich, J., Dunbar, N., Wilson, S., Miller, C., Adame, B., Lee, Y-H., Burgoon, J., & Nunamaker, J. F. (2016). Serious games: An evaluation framework and case study. In *Proceedings of the 49th Hawaii International Conference on System Sciences (HICSS)*, Koloa, HI (pp. 638-647).

Wilson, E. (2003). Perceived effectiveness of interpersonal persuasion strategies in computer-mediated communication. *Computers in Human Behavior, 19*(5), 537 -552.

Wilson, E. V., & Morrison, J. P. (2000). A measure of task-technology fit for computer mediated communication. In S. Clarke, & B. Lehaney (Eds.), *Human centered methods in information systems: Current research and practice* (pp. 145–158).

Hershey, PA: Idea Group.

Winter, S., Krämer, N. C., Rösner, L., & Neubaum, G. (2015). Don't keep it (too) simple:
How textual representations of scientific uncertainty affect laypersons'
attitudes. *Journal of Language and Social Psychology*, *34*(3), 251-272.

Witkin, H. A., Moore, C. A., Goodenough, D. R., & Cox, P. W. (1977). Field-dependent
and field-independent cognitive styles and their educational implications. *Review of
Educational Research*, *47*(1), 1-64.

Witmer, B. G., Jerome, C. J., & Singer, M. J. (2005). The factor structure of the presence
questionnaire. *Presence, 14*(3), 298-312.

Witmer, B. G., & Singer, M. J. (1998). Measuring presence in virtual environments: A
presence questionnaire *United States Army Research Institute for the Behavioural
and Social Sciences, 7*(3), 225-240.

Woodward, T. S., Buchy, L., Moritz, S., & Liotti, M. (2007). A bias against
disconfirmatory evidence is associated with delusion proneness in a nonclinical
sample. *Schizophrenia Bulletin, 33*(4), 1023-1028.

Woodward, T. S., Moritz, S., Cuttler, C., & Whitman, J. C. (2006). The contribution of a
cognitive bias against disconfirmatory evidence (BADE) to delusions in
schizophrenia. *Journal of Clinical and Experimental Neuropsychology*, *28*(4), 605-
617.

Woodward, T. S., Moritz, S., Menon, M., & Klinge, R. (2008). Belief inflexibility in
schizophrenia. *Cognitive Neuropsychiatry, 13*(3), 267-277.

WorldAtlas (2018). *Religious composition of South-Asian countries*. Retrieved from
https://www.worldatlas.com/articles/religious-composition-of-the-countries-of-
south-asia.html

Xu, Q., & Behring, D. (2014). The richer, the better? Effects of modality on intercultural
virtual collaboration. *International Journal of Communication, 8*, 2733–2754.

Yee, N., & Bailenson, J. (2007). The proteus effect: The effect of transformed self

    representation on behavior. *Human Communication Research, 33*(3), 271-290.

Yee, N., Bailenson, J. N., & Ducheneaut, N. (2009). The Proteus effect: Implications of

    transformed digital self-representation on online and offline behavior.

    Communication Research, *36*(2), 285-312.

Yee, N., Bailenson, J. N., Urbanek, M., Chang, F., & Merget, D. (2007). The unbearable

    likeness of being digital: The persistence of nonverbal social norms in online

    virtual environments. *CyberPsychology & Behavior*, *10*(1), 115-121.

Yoo, B., Donthu, N., & Lenartowicz, T. (2011) Measuring Hofstede's five dimensions of

    cultural values at the individual level: Development and validation of CVSCALE.

    Journal of International Consumer Marketing, 23(3-4), 193-210.

Zanbaka, C., Goolkasian, P., & Hodges, L. (2006). Can a virtual cat persuade you? The

    role of gender and realism in speaker persuasiveness. In *Proceedings of the*

    SIGCHI conference on Human Factors in Computing Systems (pp. 1153-1162).

    ACM.

Zarnoth, P., & Sniezek, J. A. (2002). *The futility of the overconfident communicator:*

    How confidence helps and hinders persuasion. Unpublished manuscript.

Zawadzki, J. A., Woodward, T. S., Sokolowski, H. M., Boon, H. S., Wong, A. H. C., &

    Menon, M. (2012). Cognitive factors associated with subclinical delusional

    ideation in the general population. *Psychiatry Research, 197*(3), 345-349.

Zhang, D., Lowry, P. B., Zhou, L., & Fu, X. (2007). The impact of individualism-

    collectivism, social presence, and group diversity on group decision making under

    majority influence. *Journal of Management Information Systems, 23*(4), 53-80.