UC Irvine
UC Irvine Electronic Theses and Dissertations

Title
Disentangling Normative and Informational Influence in Group Decision Making

Permalink
https://escholarship.org/uc/item/5n58k60w

Author
Garcia, Robert Jaffe

Publication Date
2016

Peer reviewed|Thesis/dissertation

eScholarship.org Powered by the California Digital Library
University of California

UNIVERSITY OF CALIFORNIA,

IRVINE

Disentangling Normative and Informational Influence in Group Decision Making

DISSERTATION

submitted in partial satisfaction of the requirements

for the degree of

DOCTOR OF PHILOSOPHY

in Psychology and Social Behavior

by

Robert J. Garcia, M.A.

Dissertation Committee:

Professor Nicholas Scurich, Chair

Professor Peter H. Ditto

Professor Elizabeth F. Loftus

2016

© 2016 Robert Garcia

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACKNOWLEDGMENTS

It is truly a challenge to adequately thank everyone who made this dissertation possible. As the saying goes, "It takes a village to write a thesis." Nonetheless, it would be remiss if I failed to acknowledge the central figures in this endeavor.

Thank you to my primary advisor, Dr. Nicholas Scurich, for your extensive guidance in planning, conducting, writing up, and thinking about my research. You helped me feel like a valuable member of the department with ideas that were worth supporting and exploring thoroughly. I am in awe of your work ethic and the extent to which you embody the ideals of productivity, practicality, and efficiency. I will strive to emulate these qualities of yours regardless of where I end up career-wise. I am extremely grateful for your mentorship.

Thank you to the other members of my dissertation and advancement committee: Dr. Peter Ditto, Dr. Elizabeth Loftus, Dr. Jutta Heckhausen, and Dr. Cornelia Pechmann. Pete, I'm grateful for all your feedback, the opportunity to sit in on your lab meetings, and the opportunity to be your TA. Everything about you evokes the idea of work-life balance and my stress levels instantly go down when we talk. Your practical way of thinking and analyzing concepts by using everyday scenarios and language has been a great positive influence on the way I attempt to communicate my own ideas and discuss their relevance. Beth, I describe you to my friends and family as the Sherlock Holmes of memory. Your commitment to hunting down every last clue with brilliant ingenuity and then eloquently sharing that knowledge with the public is inspiring and I cannot think of a more exemplary way to be a scientist. Jutta, thank you for guiding me through my early years of graduate school and especially for your help with my challenging second-year project. Your Motivational Theory of Lifespan Development has become an invaluable tool for conceptualizing and reflecting on the goals that mark the trajectory

of my own life narrative. Connie, thank you for all of your statistical instruction and feedback about experimental design. I appreciate your keen editorial eye and cheerful energy.

I would also like to thank UCI's Psychology and Social Behavior staff for all of their assistance with administrative tasks and for making the department feel like a welcoming place. Donna Blue, Toni Browning, Ellen O'Bryant, Tiffany Novak, Claudia Campos, thank you for all of your help and patience, whether dealing with comprehensive exam issues or just securing new keys for the lab. Roxy Silver, thank you for being such a warm and supportive graduate advisor.

I am quite fortunate to say that the line between friends and colleagues is seldom palpable in this department. Though I am grateful to the many students who have shared this department with me since my arrival, I would like to give special thanks to Chris Marshburn, Christina Pedram, Jake Moskowitz, Sean Wojcik, Lawrence Patihis, Matt Hunt, and Ian Tingen for providing me with endless encouragement and advice, as well as many resources for navigating graduate school. Anna Smith, Daniel Bogart, Kevin Cochran, Kate Leger, Becky Grady, Lauren Reiser, Jared Lessard, Liz Schulman, Cait Cavanaugh, Emily Hooker, Emily Urban, and Eric Chen, thank you for your great company and academic camaraderie. Dr. Stephanie McEwan – thank you for being such a warm, nurturing presence in this department and for treating everyone with the kindness that comes from recognition of each person's value and uniqueness. It was a pleasure working with you and learning from you.

I owe special thanks to all of the research assistants who served as confederates, experimenters, and planners. Jerry Wang, Anita Wong, Jun Koizumi, Michelle Propst, Shay Willard, Josh Bieler, Richard Minor, Nadine Sidhom, Theresa Lee, Alandi Bates, Seung-Min "Austin" Moon, Elijah Bueno, Dana Joudi, Sean Kennedy, Ronald Zavaleta, Dean Gribbons, Brian Jones, Cara Phillips, Craig Tozer, Annie Nguyen, Rammy Salem, and everyone else who

has spent time in our research team – thank you all for your excellent work and dedication. Having such a labor-intensive project with a team as large as ours was something I did not foresee, but meeting and getting to know all of you has been a pleasant surprise. I am excited to see where you all go in your respective careers. Dr. Joanne Zinger, I owe you tremendous thanks for helping me time and time again with research assistant recruitment. Your unwaveringly cheerful disposition that you conveyed over the phone is the very first thing I remember about my acceptance to UC Irvine and it has been a constant source of comfort throughout my years here.

Thank you, Dr. Matthew Lieberman, for inspiring my passion for social psychology and for setting a perfect example of what teaching can and should be. I will never forget your classroom dynamic and style of teaching – you treated class like a magic show and, not surprisingly, always had full attendance and a captivated audience. Learning the concepts in the beautiful way you explained them felt nothing short of enlightening and I am forever grateful for having been lucky enough to be in your class. You mentioned hoping that students would run into you in the subway five years in the future and be able to reiterate at least a few concepts from your class on the spot – I hope I get the chance to meet you again someday to exceed those expectations. I always do my best to pass on your enthusiasm to the students I teach – I do not want them to miss out on the excitement and knowledge of this wonderful field.

Neil Young, Laurel Austin, Laura Baker, Peter Kirwan, Michael and Shira Lutz, Brian Sonia-Wallace, Shant Davidian, Aimee, Beverly, and Marty Zisner, Phyllis Margolies, Ben Leffel, Max Lichtig, Mohit Sharma, Mehdi Razuane, Allison McKnight, Julie Simons, Diana Mullins, Corinne Alsop, Robert Walikis, Matthew Hays, Benjamin Hersh, Chrystal Solis, Kelleigh Martin, Bianca Bulic, Pasha Ameli, Abid Mogannam, Ryan Holben, Scott Lerner, Riley

O'Donnell, Kara Young, Andy Neilson, Kaitlin Lutz-Lawlor, Io Kleiser, Chris Narrie, Bre Sheldon, Adam Schiderman, Alix Hui, Victor Adams, Verena Harrauer, Melissa Hsiao, Kandace Brown, Eulalie Laschever, Yuce Ma, and Rico Bumbaca: thank you all for being such great friends during my time at UC Irvine. You are all wonderful people and, without your friendship, I would not have retained my sanity these challenging years. You have all helped me keep things in perspective and stay motivated when I doubted myself.

Last but not least, I would like to thank my phenomenal family for all the love and support they have shown me throughout this time. You have all provided the essential balance that I needed at every step along the way and instilled me with the drive to use what I know to do acts of goodness in the world. I love you all.

CURRICULUM VITAE

ROBERT J. GARCIA

Dept. of Psychology & Social Behavior
4201 Social & Behavioral Sciences Gateway
Irvine, CA 92697

Email: garciar1@uci.edu
Tel: (310) 733-6574

Education

2010-2016 **University of California, Irvine**

Ph.D. in Psychology and Social Behavior
Major: Personality and Social Psychology
Minor: Quantitative Methods

2013 **University of California, Irvine**

M.A. in Social Ecology

2007-2010 **University of California, Los Angeles**

B.S. in Cognitive Science; Summa Cum Laude, Phi Beta Kappa National Honor Society
Minor in Computing

Publications

Scurich, N., Krauss, D. A., Reiser, L. A., **Garcia, R. J.**, Deer, L. (2015) Venire jurors' perceptions of adversarial allegiance. *Psychology, Public Policy, and Law*, *21*, 161-168.

Articles Under Review

Grady, R. H., Reiser, L., **Garcia, R. J.**, Koeu, C., Scurich, N. Impact of gruesome photographic evidence on legal decisions: A meta-analysis

Posters Presented at Conferences

Garcia, R. J., Young, N., Heckhausen, J., Levine, L. Social influences on task motivation: Asch's conformity studies revisited. Society for Personality and Social Psychology (February, 2015)

Research Experience

2014-2015 **UCI Jury Research Lab**

Independently managed a team of over 60 undergraduate research assistants while conducting experiments on how peer pressure affects jury decision making (approximately 20 assistants worked on the project per academic quarter). This research involved a mock jury conformity paradigm that required the use of confederates.

2010-2014 **UCI Lifespan Development and Motivation Lab**

Collaborated with Dr. Jutta Heckhausen and graduate students in the formation and implementation of several motivational psychology studies and contributed to weekly meetings.

2009-2010 **USC Information Sciences Institute**

Analyzed and annotated a corpus of undergraduate engineering discussions for the purpose of natural language processing (NLP) as part of the Pedagogical Discourse project, aimed at creating learning opportunities by connecting students to each other and related media.

2009 **SPUR AGEP SRS at UCLA (Summer Program for Undergraduate Research – Alliance for Graduate Education and the Professoriate - Summer Research Scholars)**

Produced graphical data representations for an artificial intelligence model of analogical reasoning. Assisted in finalizing the design of graduate mentor, Shuo Chen's experiment concerning the acquisition of problem-solving intuition, as well as running subjects. Engaged in weekly individual meetings with faculty mentor, Keith Holyoak, Ph.D., as well as group meeting to discuss results and implications of the experiments. Presented a poster explaining this research at a science symposium.

Summer 2005. Winter-Spring 2008, Spring 2009 **Research Assistant**

Under the auspices of Robert Bjork, Ph.D., worked with Benjamin Storm, Ph.D., and Matthew Hays, Ph.D., on various experiments regarding retrieval-induced forgetting (RIF). Responsibilities in both cases included running subjects in the experiments, coding and inputting data, and writing relevant research papers. Attended and contributed to weekly discussion meetings with faculty and graduate students about research design, methods, and presentation.

Work Experience

2015 Consultant for SEED OC Environmental Non-profit Organization

Contributed strategic advice and research skills to a project designed to facilitate Habitat for Humanity's rapport with the city of Fullerton and optimize environmentally conscious practices.

2010-2015 **UCI Teaching Assistant**

Supplemented professors' instruction both inside and outside of class via discussion sections, guest lectures, student emails, and graded materials for the following courses:

- Introductory Psychology/Psychology Fundamentals
- Abnormal Psychology
- Behavioral Medicine
- Naturalistic Field Research
- Health Psychology
- Social Epidemiology
- Social Psychology
- Psychology of the Workplace
- Sport Psychology

2014-2015 **UCI InterConnect Mentor**

Mentored new international students at UCI, assisting them with both academic and cultural adjustments.

Honors and Awards

2016 Dean's Dissertation Writing Fellowship (School of Social Ecology, UCI)

2012 Graduate Student Mentorship Award

2007-2010 UCLA Regents Scholarship Recipient

2009 SPUR (Summer Program for Undergraduate Research) Program Participant

Skills

Language - Bilingual (English and Spanish)

Computing - Proficient in Microsoft Word, Microsoft Excel, and Microsoft PowerPoint. Programming experience in Java, C++, and Inquisit software. Statistical analysis training with SPSS and Stata.

Miscellaneous

Psychology and Social Behavior Undergraduate and Faculty Fall Meet & Greet
"What You Need to Know About Graduate Admissions" Panelist

Attended SPSP Conference in San Antonio, Texas, 2011, New Orleans, Louisiana, 2013, and Long Beach, California, 2015

Attended AP-LS Conference in San Diego, 2015

ABSTRACT OF THE DISSERTATION

Disentangling Normative and Informational Influence
in Group Decision Making

By

Robert Garcia

Doctor of Philosophy in Psychology and Social Behavior

University of California, Irvine, 2016

Professor Nicholas Scurich, Chair

Although extensive social psychological research has examined conformity for individualized behaviors, no laboratory research has experimentally manipulated conformity in the context of group decisions. Normative conformity is motivated by the desire for social acceptance while informational conformity entails looking to others for correct answers. Using the applied context of a jury deliberation, the present studies aimed to disentangle the relative effects of normative and informational conformity by comparing participants' votes and ratings of evidence convincingness before and after exposure to a confederate group's opinions during a poll. Private polls were intended to shield jurors from normative influence, while public polls invited conformity via both normative and informational influence. Results showed disagreement with the group majority during the first poll was a consistently strong predictor of vote switching, but no significant differences emerged in vote switching between public and private deliberation. Changes in beliefs about the strength of the evidence against the defendant partially mediated the effect of a disagreeing majority on vote switching. For participants who initially voted guilty, changes in beliefs drove a greater proportion of conformist vote switching

in public deliberations than in private deliberations. This finding suggests that people may weigh public comments in group decisions more heavily or that the pressure to conform in public deliberation may increase susceptibility to belief change. More generally, it also suggests that normative pressure may sometimes fuel informational influence, and that the two constructs may be more linked than previously conceptualized. Implications are discussed for extant research on the intersection between conformity and group decision making and for jury protocol.

Keywords: Conformity, jury deliberation, group decision making, voting behavior

CHAPTER 1:

Introduction

Introduction

Juror #8: I just want to talk.

Juror #7: Well, what's there to talk about? Eleven men in here think he's guilty. No one had to think about it twice except you.

Juror #10: I want to ask you something: do you believe his story?

Juror #8: I don't know whether I believe it or not - maybe I don't.

Juror #7: So how come you vote not guilty?

Juror #8: Well, there were eleven votes for guilty. It's not easy to raise my hand and send a boy off to die without talking about it first.

Juror #7: Well now, who says it's easy?

Juror #8: No one.

Juror #7: What, just because I voted fast? I honestly think the guy's guilty. Couldn't change my mind if you talked for a hundred years.

Juror #8: I'm not trying to change your mind. It's just that... we're talking about somebody's life here. We can't decide it in five minutes. Supposing we're wrong?

***

The exchange above from Reginald Rose's *Twelve Angry Men* (1957) captures the fundamental conflict and challenge of group decision making. In a wide variety of situations, people sometimes find that their individual perspectives and moral convictions clash with those advocated by the majority in the group to which they belong. Such situations compel individuals to either muster the courage to stand up to the group to some extent or to swallow their convictions and follow - or at least tolerate - the crowd's behavior. When the latter scenario unfolds, a problematic discrepancy can emerge between individuals' attitudes and the content of their behavioral expression; divergence between the sphere of one's private thoughts and the ideas shared with the group curtails progress toward the goal of authentic and full

communication. In the case of *Twelve Angry Men*, Juror #8's lone decision to eschew quiet cooperation by sharing his true thoughts with the other jurors culminates in the important consequence of reversing the other jurors' views and saving the defendant from the death penalty. One must note that this persistent defiance of the majority is remarkable precisely due to its rarity in group decision-making processes (see Davis, Kerr, Stasser, Meek, & Holt, 1977) – the film illustrates both the conflict generated by atypical nonconformist behavior in a jury context and its rewards.

Implicit in everyday social life, groups offer benefits associated with concepts like community, collaboration, support, division of labor, supervision, and collective wisdom. Indeed, this notion has propelled group decisions into common practice throughout the world and across history and it serves as the bedrock of democracy. On the other hand, the strength in numbers inherent in groups also leads to the capacity for intimidating or overpowering individuals either inside or outside of the group. Many individualist cultures often construe conformity to a norm different from one's natural individual inclination as a loss of precious individuality (Bond & Smith, 1996). As another example, despite the virtues of democracy, the concept of the tyranny of the majority has received recognition as a valid source of concern in governance and other kinds of group decisions. Majorities can act nobly on behalf of the whole community or selfishly on behalf of exclusive interests at the expense of justice. Additionally, groups can promote thinking that incorporates *argumentum ad populum,* the fallacy of considering the beliefs of the majority to be true on the basis of sheer numeric superiority rather than the merit of their content. Overall, thus, the optimization of group decisions requires drawing on the strengths of the many while accounting for the sensitivities of the few. The

following literature review will lay the foundation for a series of studies that offer advancement in our understanding of how individuals negotiate group decisions while striving for this balance.

Intragroup Dynamics: Overview

Virtually any survey of humanity at any point in its history reveals that human beings are undeniably social animals. The ubiquitous pursuit of social attachments and resistance to their dissolution has been articulated in theoretical terms as a "need to belong" (Baumeister & Leary, 1995). With this in mind, it comes as no surprise that people will modify their behavior in group situations in order to preserve their social wellbeing. In fact, behavioral responses to subtle social variables are so well calibrated as to often occur automatically and outside of awareness; this notion constitutes one of the situationist pillars of social psychology (Ross & Nisbett, 1991). Since Triplett's (1898) pioneering studies of social facilitation – the phenomenon of people performing independent tasks at a higher level when in the presence of others – experimental social psychological research has sought to illuminate which aspects of social situations reliably manipulate human behavior.

Social norms - rules and standards that are understood by the members of a group and regulate behavior without the force of laws - stand out as one of the key mechanisms underlying intragroup dynamics (Cialdini & Trost, 1998). Norms serve both filtering and cohesive roles in groups, upgrading or downgrading an individual's membership as a function of adherence; failure to adhere to norms and subsequent rejection from the group is thus regarded as the "black sheep effect" (Pinto, Marques, Levine, & Abrams, 2010). The Group Socialization Model posits a parallel effect with regard to the attitudes of potential group members: those accepted by the group as norm-compliant become more inclined to view the group favorably, thereby solidifying their membership, while those rejected by the group will tend to harbor more negative feelings

toward the group, which perpetuates their outgroup status (Levine & Moreland, 1994). Countless behavioral norms with differing degrees of specificity exist at various orders of social magnitude, but they all share the capacity for collective influence of each member by the others in the relevant (or mentally salient – see Cialdini, Reno, & Kallgren, 1990) group.

Conformity: Normative and Informational Variants

Conformity, the act of aligning attitudes, beliefs, or behaviors with the prevailing norm, stands out as one of the most powerful phenomena generated by the interaction of social norms and human sensitivity to social information (Cialdini & Goldstein, 2004) and is perhaps most elegantly captured in the pioneering research by Solomon Asch. In the most well known of these conformity studies (i.e., Asch, 1951; 1952b; 1955; 1956), participants signed up for what they thought was a vision test. They took this test in a room with four to six experimenter confederates posing as participants. Participants stated their responses to an easy visual perception task sequentially. After giving correct responses for the first few rounds of the task, the confederates gave choreographed incorrect answers unanimously for the critical trials that constituted the remainder of the experiment. Analyses of the frequency of participant conformity revealed that about three-quarters of them conformed at least once on the critical trials (Asch, 1951).

Debriefing interviews with participants illuminated two different justifications for their behavior. The majority of participants admitted to knowingly submitting incorrect responses for the sake of not standing out. This status of public agreement with the group despite private disagreement with its consensus is known as compliance (Kelman, 1958) or acquiescence (Forsyth, 2013). Intriguingly, some participants were so affected by the behavior of the confederates that they convinced themselves their eyesight was faulty and followed the group

with the hope of using their guidance to discern the correct answer (Asch, 1951). The Asch paradigm is remarkable for its demonstration of how drastically people modify their behavior to match the norm in group situations even when it contradicts what is perceptually obvious and when the likelihood of interacting with the group in the future is essentially zero.

Asch's experimental paradigm spawned numerous variations that systematically attempted to uncover more about conformity. Asch's own modifications of his paradigm in which he included a "true partner" who never wavered from correct responses (e.g., Asch, 1951; 1955) laid the foundation for the concept of punctured unanimity – the significant decrease in conformity in the presence of others deviating from the norm. With subsequent research, methodological details emerged that helped with standardization, such as the minimum of three confederates to reliably produce the peer pressure necessary for conformity (Bond & Smith, 1996). Psychological distance has been distinguished as one of the important variables addressed by subsequent studies. Even when provided with information about their peers' behavior in an anonymous, remote fashion, people still often base their choices on group norms (Crutchfield, 1955). Task difficulty constitutes another determinant of the extent of conformity pressures: difficult tasks yield greater conformity due to attempts to succeed via the knowledge of the group (Coleman, Blake, & Mouton, 1958). Increased task importance, heightened incentives for accuracy, as well as higher pressure and self-doubt also produce increased conformity for similar reasons (Baron, Vandello, & Brunsman, 1996; Campbell, Tesser, & Fairey, 1986).

Prior to the Asch paradigm's exploration of conformity responses to obvious visual stimuli, Sherif's (1935) research on the "autokinetic effect" had laid the groundwork for examining conformity in response to ambiguous visual stimuli. Sherif's finding that people

assembled in a pitch-black room will conform to the norm created by their peers' judgments about perceived (but illusory) movement of a narrow beam of light – even when the peers are removed from the room – showed that suggestibility prevails when people pursue accuracy goals. Subsequent laboratory studies in this vein of research continued the use of prompts for judgments about ambiguous stimuli in the presence of others to study the extent of social referencing while acknowledging the potential for social desirability motives to interfere. For instance, the extent of individual judgment shifts for ambiguous visual stimuli is moderated by the strength of a group's members' familiarity with each other; social pressure for such judgments appears stronger when people are surrounded by those they see frequently and have known for a long time compared to immersion in a context of strangers (Bovard, 1953). When taken together with the Asch studies, studies like Sherif's (1935) and Bovard's (1953) illustrate a trade-off between the motive to belong and the motive to be accurate based on stimulus clarity or ambiguity, respectively.

Deutsch and Gérard (1955) were responsible for one of the greatest theoretical contributions in conformity research, namely, the distinction they delineated between normative and informational variants of conformity. Normative influence originates with the basic desire to not stand apart from a group and the desire for social acceptance (see Baumeister & Leary, 1995), and accordingly, varies according to one's perceived risk of social rejection (Dittes & Kelley, 1956). Informational influence entails the motive of benefitting from the knowledge of the group in the pursuit of correct beliefs. Social comparison theory suggests that that people do indeed have a strong drive to hold accurate opinions and evaluations of the world and themselves and will try to inform them using accessible social contexts (Festinger, 1954). These two forms of conformity need not be mutually exclusive, but many situations feature dominance of one or

the other. For instance, using a group of confederates in a busy urban area, Milgram, Bickman, and Berkowitz (1969) induced the majority of passersby to look up into the sky as though in search of a flying object; this behavior was presumably matched by the public not out of fear of social rejection, but simply as a product of social referencing (instinctual checking to see what others are doing; see Feinman, 1992) and the inference that something of interest must be in the sky.

At first glance, the Asch paradigm would seem to be primarily one of normative influence, given the obviousness of the visual information in question and the possibility of evaluation by peers engaged in the same task, but the analysis is in fact more complicated. While the desire to not stand out in the group was certainly a motivation for many participants, part of the participants' confusion lay in reconciling the discrepancy between their judgments and the group's; the very obviousness of the stimuli made the situation that much more extreme and confusing. Participants in the Asch paradigm thus had to reconcile the notion of having a discrepant view of the stimuli from the crowd with the strength of the crowd's numbers (akin to the credibility ascribed to replicated findings in science) – as naïve participants, the explanation of being in the study did not occur to them. Subsequent studies demonstrated that conformity decreased in the Asch situation when other possible attributions for the discrepancy (e.g., different rewards being offered to different participants for particular correct responses) were made salient (Ross, Bierbrauer, & Hoffman, 1976). Deutsch and Gérard's (1955) modified version of the Asch paradigm thus bifurcated experimental conformity research by highlighting the theoretical implications of shielding participants from identification and social evaluation by the group. The authors reasoned that participants giving responses in private experience reduced

normative pressure, while those in public response conditions experience a more powerful but unclear combination of normative and informational pressures.

Normative and Informational Influence in Group Decision Making

"Had every Athenian citizen been a Socrates,
every Athenian assembly would still have been a mob."

– James Madison, *The Federalist No.55* (1778)

***

The quote above captures the notion that individual discretion is quite fragile in the context of strong intragroup forces like social pressure for conformity and deindividuation (see Zimbardo, 1969). Thus far, this discussion has focused on conformity as it applies to individual behaviors carried out in parallel toward independent outcomes (e.g., scores on a visual perception test), but now we turn our attention to the escalated social situations inherent in group decisions, where the outcome or consensus is dependent on the interactions within the group. At the aggregate level, considerable research (see Esser, 1998, for a review) has suggested that groups can and often do produce suboptimal decisions when stakes are high: the term "groupthink" (Janis, 1971; 1972; 1997; McCauley, 1998) has emerged to describe the problematic tendency for groups to radicalize prevailing ideas and relax information search rigor, and for members to self-censor criticism or helpful dissent in an effort to achieve consensus (see Nemeth, 1986; Schulz-Hardt, Brodbeck, Mojzisch, Kerschreiter & Frey, 2006; Tindale, Smith, Dykema-Enblade, & Kluwe, 2012). Prototypical examples of groupthink include the CIA's decision to initiate the Bay of Pigs Invasion, the Nixon Administration's decision to attempt to cover up the Watergate Scandal, and NASA's decision to launch the Space Shuttle *Challenger* despite awareness of structural flaws (Esser, 1998). It is important to note that the groupthink

hypothesis of conformity does not account for initial preference distributions (Whyte, 1989) or the likely explanatory mechanism of loss aversion (see Kahneman & Tversky, 1979) despite its usefulness otherwise in promoting vigilance for potential shortcomings in group decisions. Group discussions tend to follow the path of least resistance via distinct trains of thought in a process characterized by "cognitive inertia" (Lamm & Trommsdorff, 1973) and focus on easily recalled shared information, rather than critical unshared information (known only to a minority of the group members) that would improve decision quality (Stasser & Titus, 1985; Dennis, 1996; Dennis, 1997; Winquist & Larson, 1998).

Group Polarization

In addition to the tendency for group discussion to promote the errors of omission discussed above, individual opinions tend to become more extreme over the course of interaction with a group in what has been deemed the group polarization effect (Myers & Lamm, 1976). In other words, group members tend to arrive at individual opinions that are typically more extreme than the average pre-discussion opinion of the group as a whole. This adds a level of nuance to prior conformity research by suggesting that mere convergence of pre-discussion views was not enough to account for the more extreme positions advocated by group members after discussion (Fitzpatrick, 1979). Group polarization thus eclipsed research on the risky-shift, the tendency for groups to make riskier decisions than individuals (e.g., Stoner, 1961; Baron, Dion, Baron, & Miller, 1971; Cartwright, 1971; Baron, Monson, & Baron, 1973; Cooper & Wood, 1974), by focusing on the group members' cognitions rather than merely the decision outcome (Davis, Laughlin, & Komorita, 1976; McGrath & Kravitz, 1982). Research paradigms measuring group members' opinions before and after group discussions have consistently shown reductions in variability of opinions after conversing with the group (Moscovici & Zavalloni, 1969; Pruitt,

1971; Moscovici, Doise, & Dulong, 1972; Myers & Lamm, 1975) and this finding extends to mock juries (Myers & Kaplan, 1976).

Much like the stimulus ambiguity spectrum between the Asch (1951) and Sherif (1935) paradigms, the ambiguity of the issue or stimulus in question (i.e., whether it is fact- or opinion-based) predicts the extent to which group polarization will occur. Various studies of groups making factual judgments (e.g., Doise, 1969; Kogan & Wallach, 1966; Moscovici & Zavalloni, 1969) suggest that polarization effects are limited for fact-based questions compared to subjective social or ethical issues (see Lamm & Myers, 1978, for a review). The leading threads of group polarization research posited two explanations for the polarization and homogenization of attitudes and beliefs and groups: persuasive argumentation (e.g., El-Shinnawy, & Vinze, 1998; Myers, 1989) and social comparison (e.g., Sanders & Baron, 1977; Myers, 1978). A meta-analysis by Isenberg (1986) suggests that both of these types of effects can occur together or separately to mediate group polarization, though the former has larger effect sizes that may gain footing through processes as basic as the mere-exposure effect (Myers, Bruggink, Kersting, & Schlosser, 1980).[1] However, the mechanism of social comparison does reveal a noteworthy point about motives for normative conformity in cases of group polarization: in addition to avoiding deviance by matching norms of opinion valences, individuals may polarize (i.e., increase the magnitude or strength of) their professed views in an attempt to embody the group ideals (Myers & Bishop, 1971; Myers, 1978). Normative conformity can thus entail a combination of matching and exceeding norms, depending on the chosen criteria, which makes inclusion of both dichotomous and interval dependent variables a prudent instrument choice.

[1] A caveat to the notion of mere exposure to ideas being sufficient for attitude change is the findings of Greenwald (1968), which suggest that passive learning about a given attitude is insufficient for attitude change to occur. Rather, an interactionist model to attitude change is more likely to be accurate – internalization of the ideas emerges from rehearsal and examination within one's own mind.

Theoretically, persuasive argumentation maps onto informational influence while social comparison may contain both normative and informational components. Myers, Bach, and Schreiber (1974) conducted an experiment based on a similar premise: participants in an informational influence condition held discussion of relevant arguments without individual pretest prompts (to prevent preconceptions about the judgment being made) while participants in normative influence conditions were exposed to the preference distributions of the group prior to discussion. Both of these groups showed more polarization via group influence than control groups, thereby corroborating the notion of two possible origins of polarization effects. More generally, all other situational variables being equal, the particular dominant mechanism of persuasion (i.e., opinion or attitude change) via group influence may depend on an individual's level of attention and scrutiny to the information discussed; the Elaboration Likelihood Model of Persuasion predicts one could feasibly be more swayed by normative pressure if reflection on the group situation and the facts at hand are minimal, or more swayed by compelling information presented in arguments when in a critical mindset (Petty & Cacioppo, 1986). Methodologically, it is important to note that these types of studies were almost always conducted using groups comprising only real participants interacting freely with each other; such extra degrees of freedom from multiple participants being run at once and interacting in complex ways limit the causal inferences to be drawn for specific individual cognition.

Deliberation Style

Deliberation style merits attention as a concept pertinent to information sharing and the distinction between normative and informational influence in group decision-making research. Hastie, Penrod, and Pennington (1983) identified two main deliberation styles among juries: verdict-driven deliberations and evidence-driven deliberations. Juries using the former style tend

to take early public polls for preferred verdicts and focus on establishing consensus in order to choose a verdict, thus relying on considerable normative pressure as they negotiate what effectively becomes an adversarial relationship between the majority and minority factions. In contrast, juries characterized by the latter style effectively use deliberation as an information gathering session with the goal of establishing the facts as best as they can and letting the verdict emerge from that process organically prior to polling. In evidence-driven deliberation, minority dissent is much more likely and also has a greater chance of being processed more deeply due to the group's heightened epistemic motivation, which leads to increased decision quality and juror satisfaction with the group's decision (Hastie, Penrod, & Pennington, 1983; De Dreu, Nijstad, Baas, & Bechtoldt, 2008). Evidence-driven deliberation is estimated to dominate between 31% and 40% of deliberations, with the remainder exhibiting at least some of the traits of the verdict-driven style (Devine et al., 2007; Sandys & Dillehay, 1995), so the presence of normative pressure is far from negligible with respect to this classification criterion.

Whether normative or informational influence dominates a group's deliberation may also be determined by the instructions the group receives. When accuracy goals of the task at hand are highlighted, informational influence and evidence-driven deliberation takes precedence, while social harmony priorities tend to encourage normative influence and verdict-driven deliberation (Rugs & Kaplan, 1993). Though deliberation style originated as a term to describe juries, it is not unreasonable to consider analogous characterizations for other types of group decisions; indeed, deliberation does not exclusively refer to juries.

Individual Versus Group Decisions

Despite the competing imperfections of individual decisions (see Kerr, MacCoun, & Kramer, 1996; Irwin & Davis, 1995; MacCoun, 2002), the flaws discussed above are concerning

for the process entrusted to issues as important as government decisions, military decisions, business decisions, and jury verdicts. Though pure competition between group members is rare, the other extreme of pure, unhindered cooperation is also rare, as groups typically operate with mixed motives (Kelley & Thibaut, 1969). Group performance on a task may often exceed individual performance, but it rarely attains the ideal level of knowledge pooling suggested by statistical models; redundancy (of ideas or mental effort) and failure to incorporate the best ideas of group members contribute to this notion of "process loss" (Hill, 1982). Group decisions in their ideal form would capitalize on multiple viewpoints while ignoring social pressures and natural inclinations toward social referencing. In other words, social pressure would not be conflated with information gathering and evaluation and thus no conformity would take place – all judgments would be made as though in isolation and merely cross-referenced with the group as a final safeguard for decision quality. The effects of group decision situations on individual judgment and decision making – that is, the mechanisms behind how groups change the minds and votes of their members – are less well understood and will therefore constitute the focus of this literature review.

Faction Size Effects

Perceived majorities wield a remarkable amount of power in determining the outcome of group decisions, so they are at least responsible for changing the votes, if not the private views, of minority opinion holders. For example, faction size during initial polls prior to deliberation has been identified in regression analyses as one of the strongest predictors of mock jury verdicts: the likelihood of the minority faction (or factions) capitulating in the final verdict increases with each additional member and becomes very high once the "success" threshold of a two-thirds majority is attained (MacCoun & Kerr, 1988). Accordingly, a given individual's

preferences have very weak predictive value for the verdict delivered by his or her group: Kerr and Huang (1986) used probabilistic modeling to show that such predictors account for only 5% of jury behavior in a 12-person jury and only slightly more variance in smaller juries. Kalven and Zeisel's (1966) pioneering study of 225 juries offers some of the strongest evidence in favor of conformity via faction size effects: the ten juries that were evenly split during their initial poll were equally likely to convict or acquit, while 91% of the remaining 215 juries gave verdicts favoring the majority position on the first vote. The presence and magnitude of this majority dominance effect has also been corroborated by substantial research on real juries using retrospective reports of initial poll votes to reconstruct the initial faction sizes (Devine et al., 2004; 2007; Hannaford-Agor, Hans, Mott, & Munsterman, 2002; Kalven & Zeisel, 1966; Sandys & Dillehay, 1995).

To provide an overarching characterization of faction size effects, Devine et al. (2001) conducted a meta-analysis that yielded results suggesting that the likelihood of a faction capturing the verdict increases with each additional member at the beginning of deliberation. This effect is moderated by the verdict advocated by the majority – factions favoring acquittal succeed in securing unanimous verdicts more often than those favoring conviction, in a pattern termed "leniency asymmetry" (Kerr & MacCoun, 2012), though this effect is stronger for mock juries than real juries (Devine et al., 2004; Devine, 2012). Undoubtedly, faction size effects indicate that group decisions are ripe territory for studying conformity effects with respect to jury verdicts. The psychological motivation for capitulation, and therefore conformity, by the minority faction members still warrants further attention as discussed below.

Accountability

Accountability, the pressure to justify one's views to others, deserves mention as another concept closely related to the dilemma of an individual facing conformity pressure during a group decision. Note that this variable partially overlaps with that of public versus private polling or voting: participants using private ballots have no substantial sense of accountability to the group, whereas those expressing views publicly will most likely feel the need to manage the impression that others form of them by justifying their stance. Prior to high-level cognition, this pressure is often resolved with the "acceptability heuristic": in social contexts, people tend to adopt the positions of those to whom they are accountable (Tetlock, 1985). In a mechanism similar to "cognitive inertia" (Lamm & Trommsdorff, 1973), Tetlock (1983a) found that accountability produces more complex information processing only when individuals feel that they no longer have the option to take the path of least resistance by advocating the position of the social entity to which they feel accountable. In fact, accountability can reduce a group's tendency to share important information known only to a few of its members due to a perceived need to focus on the discussion details preferred by the group (Stewart, Billings, & Stasser, 1998). Conformity frequently results from accountability when people feel motivated to get along with others, but the activation of accuracy goals (e.g., with priming manipulations) can override this motivation and lead to greater independence (Quinn & Schlenker, 2002). In a similar vein, Rozelle and Baxter (1981) found that accountability promotes data-driven processing and decreases theory-driven processing. In group decision making, accountability thus brings to mind the topic of deliberation style: consensus goals implicated in verdict-driven deliberations go hand in hand with the acceptability heuristic, while accuracy goals combined

with accountability should yield a more evidence-driven deliberation style (see Scholten, van Knippenberg, Nijstad, & De Dreu, 2007).

Accountability also factors into the experiences that individuals in group decisions face with respect to the decision rule: those facing the spotlight by keeping the group from its critical state of unanimity will feel more pressure to explain themselves than those in a minority that ultimately will not impede the will of the majority. Tetlock (1983a) delineated "preemptive criticism" as a characterization of more thorough information processing in the face of unknown audience norms, as contrasted with the alternative behavior of shifting one's views towards those of the audience via the acceptability heuristic when the norm is apparent. In the context of being a holdout juror, especially during unanimity rule, the task of expressing a dissenting view offers few options for alignment with the prevailing norm beyond superficial diplomacy. Bolstering one's perspective with solid justification formed through preemptive criticism would therefore be expected in an effort to maintain one's social esteem.

Considering these conceptual intersections, it would not be unreasonable to expect that group members holding minority views will feel motivated to make as strong a case as possible for retaining their position when they feel accountable and unwilling to conform. Inversely, those who feel overwhelmed by group pressure are expected to capitulate at least partly due to a reluctance to justify their dissenting view. By using confederates to ensure a particular preference norm (see Smith, Terry, & Hogg, 2007, for an example in accountability research) in a group and structuring the deliberation process in an experiment to either require or not require justification of one's minority position, manipulation of public or private voting and the decision rule ought to produce one of the two divergent behavioral effects described above consistent with accountability theory. Given that the central purpose of this research is to determine why people

give in to social pressure in group decision situations, accountability warrants investigation as a possible mechanism. It has already been shown to have important applications for jury decisions, in particular, as in the case of mock juries told they would be accountable to a panel of experts analyzing their deliberation record were found to avoid delivering guilty verdicts more often than those told their deliberations would be private (Davis, Stasser, Spitzer, & Holt, 1976). Accountability takes the public-versus-private voting distinction a step beyond the variable of anonymity by incorporating what the individual has to say, as well as the notion that defending views in a social evaluative context can be experienced as an aversive burden.

Public Versus Private Polling

Relatively little research has been done to directly address individuals' experiences with the normative and informational varieties of conformity during group decision making. This is surprising because voting style, most commonly either a show of hands or a private ballot, lends itself well to capturing decisions made when susceptible to or shielded from normative influence, respectively, in a manner analogous to the experimental manipulations of Deutsch and Gérard (1955). The extant studies sometimes use looser operationalizations (see Myers, Bach, and Schreiber's (1974) substitution of social comparison for normative influence and relevant arguments for informational influence) or focus on factors affecting decision quality or mathematical modeling of information sharing and decision making (e.g., see Grofman, 2013, for a signal detection theory analysis). Though useful for quantitative predictions of decision outcomes, these approaches often eschew the psychological and subjective experiences of the group members in a rather Behaviorist "black box" evasion of cognitive processes.

Information sharing research emerged from pragmatic concerns about group performance, with an emphasis on consensus and the latency necessary to achieve the goal state

of all group members acknowledging critical information previously known to only a few members (e.g., Stasser, Taylor, & Hanna, 1989; Stasser, 1992; Stewart & Stasser, 1998; Shittekatte, 1996). Redundancy is commonplace in group discussions, which often serve to reinforce previously held views instead of exchanging novel knowledge and maximizing its distribution; the biased information sampling model (Stasser & Titus, 1985; 1987) emphasizes the tendency to dwell on shared information rather than searching directly for unique pieces of information individual members may have. In contrast to intellective tasks, which have definite correct answers and benefit the most from teamwork (Laughlin, 1980), decisions like jury verdicts qualify as judgmental tasks, due to their need for consensus, and slightly less as "hidden profile task", given the possibility that the verdict may hinge on facts that may have been recalled only by a minority of members. Information sharing has also been studied in terms of openness to discussing a breadth of information (instead of just publicizing a rare subset of it), a variable that is positively correlated with group cohesion (Mesmer-Magnus & DeChurch, 2009).

When considering how information sharing research has included use of computerized group support systems (GSS) (e.g., McGuire, Kiesler, & Siegel, 1987; Mennecke, 1995), which include anonymous brainstorming features, the relevance of this work to normative versus informational influence becomes especially clear. Internalization of both novel and repeated information qualify as informational influence, while mimicry of particular aspects of information sharing (e.g., expressed opinion or frequency of contribution) could reflect normative pressures. Baltes et al's (2002) meta-analysis of computer-mediated communication and group decision making found that computer-mediated communication reduces group effectiveness, slows task completion, and decreases satisfaction with the process compared to face-to-face group decisions. With anonymous computerized modalities, each group member

makes fewer comments on average, though the representation of each member's voice is more even than in face-to-face decisions (Siegel, Dubrovsky, Kiesler, & McGuire, 1986). Groups also tend to make riskier decisions via computer compared to face-to-face, which represents a greater departure from individual decision-making tendencies (Valacich, Sarker, Pratt, & Groomer, 2002). Such findings pose a challenge for making social influence-based predictions about group performance by suggesting that anonymity as a tool for reducing bias and decision-irrelevant social forces may have side effects of its own, though fears about disinhibition and deindividuation with computer mediation seem mostly unfounded in settings that promote decorum (Hiltz, Turoff, & Johnson, 1989).

Other work on anonymity in group decision making has findings that flow more intuitively from conformity theory. For instance, compared to the use of a computerized discussion platform to promote anonymity, Dennis et al. (1997) found that group discussions with public voting were dominated by normative influence and that the reduced number of points raised by those in the minority received less consideration by the group as a whole. Similarly, Nunamaker, Dennis, Valacich, Vogel, and George (1991) found that anonymity could increase a group member's likelihood of contributing information that contradicts the dominant group preference in online settings. Kerr and MacCoun (1985) found that mock juries tend to hang more often when using public polling schemes; they suggested that the increased freedom to share dissenting views in private ballots was outweighed by jurors' tendency to feel committed to their views expressed during initial public polls.

A different vein of research on group decision making has focused on the descriptive power of mathematical modeling. For instance, Hartwick, Sheppard, and Davis (1982) used this approach to demonstrate how social support is often a prerequisite for groups to accept

recollections by individuals as true: the ideal probability that the jury will recall an item of evidence should equal $1-(1-P)^n$, where P is the probability that an individual will recall it and n is the group's size, but actual group recall typically falls between this model and a "majority rule" model. The centerpiece of this domain of research, though, is undoubtedly Davis' (1973) social decision scheme model (SDS), which takes a matrix representing all the possible pre-deliberation juror preferences (i.e., 12 guilty votes, 0 not guilty votes; 11 guilty votes, 1 not guilty vote… 0 guilty votes, 12 not guilty votes) and assigns each entry in that matrix a binomial probability of arriving at a guilty verdict, a not guilty verdict, or hanging (see Kerr and Tindale, 2012, for a discussion of the Davisonian approach to group decision making). This matrix can then be validated with empirical testing of juries and thus has had fruitfulness as a simulation tool of group decision outcomes based on individual juror views as inputs (e.g., Kerr, Davis, Meek, & Rissman, 1975; Kerr, Stasser, & Davis, 1979; Stasser, Kerr, & Davis, 1989; Kerr, Niedermeier, & Kaplan, 1999). The social interaction sequence (SIS) scheme (Stasser & Davis, 1981) subsequently emerged to incorporate degree of certainty, assigned decision rule (majority versus unanimity rule), and any imposed time limits into the modeling process in order to predict both verdicts and the distribution of opinions after the decision. The SDS and SIS models for verdict and opinion change suggested that normative and informational influence must have been operating in tandem to account for the post-deliberation opinions and levels of certainty observed. MacCoun's (2012) burden of social proof model synthesized the previous leading mathematical modeling approaches of social influence by using a model with parameters for logistical thresholds and clarity with which those thresholds can be detected. This enabled modeling a family of social influence processes involving tipping points – including conformity, deliberation, helping behavior, and the diffusion of innovations – with remarkable and

unprecedented accuracy (see MacCoun, 2012). Recently, the addition of another layer of predictive precision has been underway, in which probabilities associated with demographic characteristics are factored into models (e.g., Wittlin, 2015). While such models are undoubtedly useful for making outcome predictions, they do not thoroughly account for the subjective experiences of individuals embedded in a jury situation or the experiential differences between anonymous and face-to-face discussion.

Other studies of informational influence in group decisions have involved coding discussion topics and using them to predict jury decisions with regression models (e.g., Tanford & Penrod, 1986; Hastie, Schkade, & Payne, 1998; Holstein, 1985) – in general, they suggest that the content of discussion predicts jury decisions to a large degree, and often better than the pre-deliberation vote distribution (the root of normative social influence in this context). Similarly, Burnstein and Vinokur (1973; 1977) found that vote preferences still changed when participants were restricted to sharing objective information about the case rather than personal opinions, which suggests informational influence at work. When recording arguments privately, these preference changes are dampened somewhat in spite of people's increased willingness to consider points for both sides of the issue at hand (Bishop & Myers, 1974; Ebbenson & Bowers, 1974; Myers & Lamm, 1976). Kaplan (1977) used a paradigm that manipulated the number of facts cited by bogus jurors for each side of the case along with the verdict those jurors advocated. While the distribution of the facts predicted polarization of participant's views, the proportion of verdicts agreeing or disagreeing with the participants did not, suggesting the primacy of informational influence. It is important to note that participants never saw or directly interacted with their fellow mock jurors, which would have certainly attenuated the potential for normative influence to emerge. While there is some evidence for distinctly normative influence in juries

(Zuber, et al., 1992), it is not without counterevidence (Myers & Lamm, 1976; Shaw, 1981). Still, given the prevalence of polling, both by a show of hands and secret ballot, normative and informational conformity warrant further and more direct comparative investigation to better understand why group members change their minds.

Stasser, Stella, Hanna, and Collela (1984) made one of the greatest contributions in the domain of comparing normative and informational influence by conducting a study that used participants assigned to argue devil's advocate positions despite their own preferences in order to pit faction size (a proxy for normative influence) against the number of arguments presented (a proxy for informational influence). Previous research on informational influence in groups had shown that the majority of arguments generated in a discussion favor the group's preferred position (Bishop & Myers, 1974; Ebbenson & Bowers, 1974; Vinokur & Burnstein, 1974). As a specific example of Stasser et al.'s (1984) methodology, in the devil's advocate conditions, if four out of six mock jurors initially favored conviction, then two of those four were assigned to argue alongside the other two in favor of acquittal. Stasser et al. found that the number of arguments in favor of a particular verdict, rather than the initial vote preference distribution, was the superior predictor of juror post-deliberation preference change.

Despite this promising finding, there are several points to critique regarding their design. Firstly, the design does not offer insight into individuals' perspectives beyond their objective voting behavior. Secondly, assigning devil's advocate positions to argue for does not allow for participants to follow their natural inclinations to think or vote as they normally would. The authors acknowledge that there is little evidence for people having the ability to argue effectively and authentically against their own position during group discussion and that attempting that could result in a variety of cognitive dissonance reduction possibilities (see Festinger, 1962;

Funder, 1982), which potentially contaminated the thought trajectory of the devil's advocate jurors. Thirdly, the authors admit that their procedure biases the informational content toward the initial minority. Fourthly, and most importantly, the authors mention that their choice of using private ballots quite possibly blunted the normative pressure in the group decision situation and shielded the devil's advocates from detection, which ultimately draws into question the extent to which the study actually addressed normative influence.

As a general comment, the individual's perspective has been outweighed as a priority for research by his or her influence on the group's decision. Accordingly, the remaining research task is to examine the experience of individuals in a group decision while avoiding compromise of the constructs in question. The most apparent method for teasing apart normative and informational influence experimentally is to take after Deutsch and Gérard's (1955) design and manipulate whether participants use public or private polls during deliberation. Confederates can be used to guarantee that a given participant finds himself or herself in the majority or minority opinion[2]. Paired with confidential questions to probe how strongly participants believe what they vote for, especially when voting publicly, this would serve as a crucial step in discerning the combination of normative or informational motives behind vote switching behavior in group decisions.

Do Normative and Informational Influences Actually Change Beliefs?

At this point, there is no doubt that normative and informational influences both motivate individual behavior during group decisions. What remains less clear is the extent to which

[2] Group decision research does not typically go to the length of using confederates to make participants the sole degree of freedom in each group (cf. Stasser et al., 1984; McLeod, Baron, Marti, & Yoon, 1997), though there are rare exceptions. For example, Salerno (2012) and Salerno and Peter-Hagene (2015) programmed a simulated online chat room where individual participants had verbal exchanges with (computerized) others that issued canned responses in order to control the course of the discussion. This is a logistically convenient approach, though it presents the notable challenge of maintaining believability and suppressing participant suspicion (see Pilot Studies 1 and 2).

individuals who yield to these pressures and conform actually come to believe the views they externally endorse. One could feasibly mimic the popular view in one's group with the desire to not be the "black sheep" or – in the absence of strong convictions about the truth of the matter – the desire to give the right answer. Neither of these options necessitates the internalization of the group's view, and even genuine conformity-induced attitude shifts last a relatively short time (e.g., three days or less for superficial judgments, according to Huang, Kendrick, and Yu, 2014). This is further complicated by the notion that arguments and counterarguments can be difficult to measure and their potentially bidirectional causal role in strengthening or modifying opinions can be even more challenging to understand (Miller & Baron, 1971). Though Asch (1951; 1952b; 1955; 1956) fruitfully asked participants during debriefing about their motives for conforming, that approach was limited by participants' introspective aptitude. For instance, Nisbett and Wilson (1977) have illustrated that people are often unaware of their motives and unable to report accurately about them. As another highly relevant example, Cohen (2003) found that participants detected political party influences on the views expressed by others but not on themselves. Attitude changes did not result from mindless conformity and instead emerged from top-down processing whereby party information highlighted target values in their search for answers.

Rather than asking group members about their motives for decisions, then, a better approach to disentangling normative and informational influences on people's beliefs during a task far more complex than making line length judgments would be to tease apart the two types of influence methodologically. The combination of tracking how views change during the course of deliberation without asking participants why they are changing and manipulating the extent of normative influence with Deutsch and Gérard's (1955) approach stands out as an

elegant experimental solution to this challenge. Bowser (2013) used this approach to measure how confidence changed before and after deliberation with a group, though there was no inclusion of a public versus private manipulation nor was there use of confederates to control the course of deliberation. Examining how conformity rates decrease in private voting conditions relative to public voting conditions provides an effective quantitative account of how much normative influence is at play in the latter.

THE PRESENT STUDIES AND HYPOTHESES

> *"The jury deliberation process… is an interesting combination of rational persuasion, sheer social pressure, and the psychological mechanism by which individual perceptions undergo change when exposed to group discussion."*
>
> – Kalven and Zeisel (1966), p. 489

***

While the operation of multiple dynamics during jury deliberation is undeniable, the present research constituted an effort to tease apart the relative contribution of normative and informational conformity effects by comparing vote-switching behavior in conditions with public and private polling. In an ideal jury decision-making process, the polling method would not have an effect on juror's voting patterns, but the psychology of normative influence and accountability suggested that would not be the case.

Hypothesis 1: *Normative influence would manifest itself through greater post-deliberation conformity in public juror polling situations compared to private polling situations*.

These studies also took the step of evaluating why jurors change their minds – by assessing their perceptions of evidence strength and quality, we can begin to determine whether they feel that the group has provided them with useful information or whether they simply want to avoid either holding up the group's decision or standing out as dissenters. The added potential for normative

pressure in public voting situations was expected to obviate intrinsic motivation (e.g., attitude or belief changes) and gave rise to the following prediction:

Hypothesis 2: Changes in ratings of evidence strength would mediate vote switching more strongly in private polling conditions than public polling conditions.

In keeping with prior literature on the prevalence of faction size effects (Kalven & Zeisel, 1966; MacCoun & Kerr, 1988; Sandys & Dillehay, 1995; Devine et al., 2004; Hannaford-Agor, Hans, Mott, & Munsterman, 2002), and more generally, the robust conformity effects when facing an opposing majority (e.g., Asch, 1951; Crutchfield, 1955; Deutsch & Gérard, 1955), the following prediction was added:

Hypothesis 3: *Jurors facing a disagreeing majority would switch their votes for the final verdict more often than those facing an agreeing majority.*

CHAPTER 2:

Methodology

Methodology

Overview

The present experiments manipulated both whether mock jurors were faced with an agreeing or disagreeing majority and whether votes and comments were issued publicly or privately (anonymously). Including conditions where the majority factions agreed with participants' initial poll votes was intended to yield baseline estimates of people's tendency to change their views and votes during group deliberations without normative or informational pressure to modify their current opinion. Public and anonymous voting conditions were designed to manipulate the extent of normative influence at work. Votes and private ratings of the evidence were recorded during the initial poll and again at the time of the final verdict so as to determine whether they changed together or independently, which addresses the question of whether people change their opinions or merely their votes over the course of deliberation.

Design

The present studies employed a 2 (public vote / private vote) × 2 (group-consistent / group-inconsistent) randomized factorial design. The dependent variables were the percentage of participants changing their vote after receiving feedback about the other jurors' voting choices and participants' ratings of the convincingness and quality of the evidence. Much like Deutsch and Gérard's methodology (1955), this study used a manipulation of requiring participants to give responses that are either shared with or hidden from the group (i.e., public or private voting) in order to distinguish the relative contributions of normative and informational influence toward vote switching behavior. Public responses were subject to evaluation from others in the group and were therefore vulnerable to normative pressure in addition to informational influence. Private responses were shielded from social evaluation and thus were only subject to

informational influence via people's use of social referencing to attempt to arrive at correct judgments. By comparing the participants' voting behavior and private beliefs about the evidence between public and private voting conditions, it was possible to calculate the strength of normative influence. The majority opinion was also manipulated relative to those of the participants in this study for the purpose of examining behavior in situations with both low and high social pressure; greater conformity was expected when participants found themselves with opinions inconsistent with the group's majority.

PILOT STUDY 1

Method

Participants (N = 308) were recruited through Amazon Mechanical Turk (see Mason, & Suri, 2012), which provides an online platform through which "requesters" can post human information tasks (HITs) that require some type of human judgment that "workers" can complete. Common HITs include surveys, questionnaires, and market research questions about products and websites. This HIT requires workers to be at least 18 years old and a citizen of the United States. Each worker's IP address was verified to ensure that it is within the United States. Workers were paid $1.00 for their participation (see Paolacci, Chandler, & Ipeirotis, 2010).

Participants signed up for this study online on Amazon's Mechanical Turk and were redirected to the Qualtrics online survey platform, where they filled out consent forms and basic demographic information including age, sex and ethnicity, and then were instructed that they would only receive credit if they participated at a specified hour (this was intended to make it more believable that five other participants will be online at the same hour). Participants uploaded photos of themselves onto the online interface as a thumbnail identification icon – this served the purpose of making participants feel more socially invested in the experiment, given

the remoteness of the online setting. Seeing five incrementally uploaded photos on the screen instead of five generic silhouettes was intended to create a stronger social situation and reduce the suspicion that the five peers are merely simulated (see Appendix A for a mixed-race and mixed-gender example of this interface). The peer juror photos selected for this initial pilot study all depicted white males in order to eliminate interaction effects between particular comments and the ethnicity or gender of the juror making them later on in the experiment.

When the session began, participants were given an opportunity to read a synopsis of a sexual assault case with arguments from both the prosecution and defense. This synopsis was approximately 800 words in length and designed to have a balance of evidence for both the prosecution and defense. Once the allotted time was up, participants were instructed to both indicate their vote (guilty or not guilty) and provide a Likert scale rating of how convincing the evidence was. Participants in the public condition were informed that the group was notified of their specific voting choice, while those in the private condition were informed of the opposite. After entering their votes, participants received a message that stated either the specific voting preferences (as indicated by the photo icons) for each of the other 5 participants (in the public condition) or a general tally of votes in favor of the guilty and not guilty verdicts (in the private condition). In the group-consistent condition, this message indicated that four other jurors shared the vote preference of the participant, while in the group-inconsistent condition, the message indicated that only one other juror shared the vote preference of the participant[3]. Devine et al.'s (2001) meta-analysis found that most real and mock juries chose the verdict preferred by the majority on the first vote, so the social feedback in this experiment was expected

[3] Having at least one other minority opinion member in the group ("punctured unanimity") can reduce rates of conformity compared to being the sole dissenter (Asch, 1951; 1955). For the purpose of the proposed experiments, seeing one other participant with the minority viewpoint is expected to make the opinion distribution manipulation more believable.

to provide ample pressure for conformity. Participants were informed that a verdict could only be delivered if the decision was unanimous. After this feedback stage, participants received another opportunity to look at the evidence before being asked to vote again and rate the convincingness of the evidence[4] – information was not shared with the group in either the public or private conditions on this second pass. Once the votes were collected and the suspicion check questions were completed, the purpose of the study was revealed to the participants and they were dismissed after receiving their redeemable compensation Amazon worker code.

Results

The total number of initial votes for a verdict of guilty was 106 (34.4%), while the total for not guilty was 202 (65.6%). Only 7 participants (2.3%) changed their votes, with a final distribution of 107 (34.7%) guilty votes and 201 (65.3%) not guilty votes. Accordingly, the chi-square test for association yielded the following statistics for vote-switching behavior between experimental conditions: $X(1) = .659$, $p > 0.999$, *ns*. The change between the first and final vote in participants' ratings of confidence in their decision (M = .523, SD = 1.20), ratings of prosecution evidence strength (M = -.085, SD = 1.51), ratings of defense evidence strength (M = 0.01, SD = 1.57), ratings of prosecution witness credibility (M = -.053, SD = 1.55), and ratings of defense witness credibility (M = 0.00, SD = 1.15) were all recorded on a nine-point Likert scale and did not differ significantly between experimental conditions. On those grounds, no further statistical tests were conducted on this data.

Discussion

Participant debriefing comments yielded some insight as to why the experimental manipulations failed. Thirty-five participants reported not believing they were interacting with

[4] At this point, an attention check question (see Oppenheimer, Meyvis, & Davidenko, 2009) was included to make sure participants remained on-task.

real jurors and that the responses were canned and robotic. Twenty-eight participants were suspicious of the ethnic and gender homogeneity of the simulated jurors. Five others reported suspicion regarding having to upload photographs of themselves, as well. There were 16 complaints about not having enough evidence. These numbers must be interpreted as merely a minimum level of suspicion; it is quite possible that other participants had passing suspicions that they did not bother to write at the end.

PILOT STUDY 2

Method

This study (N = 271 Amazon Mechanical Turk users) was methodologically identical to the first study, except 1) the jury members were diversified in terms of ethnicity and gender (see Appendix A), 2) the simulated juror comments were stylistically revised (while preserving content, namely, facts and opinions that did not add any new information to the case) to appear less robotic and randomized to avoid interaction effects with the diverse simulated jurors, and 3) additional fact details were added to the case to increase participants' sense of having enough information to convict or acquit.

Results

The total number of initial votes for a verdict of guilty was 123 (45.4%), while the total for not guilty was 148 (54.6%). Only 13 participants (4.8%) changed their votes, with a final distribution of 118 (43.5%) guilty votes and 153 (56.5%) not guilty votes. Accordingly, the chi-square test for association yielded the following statistics for vote-switching behavior between experimental conditions: $X(1) = .170$, $p = 0.286$, *ns.* The change between the first and final vote in participants' ratings of confidence in their decision (M = .69, SD =.963), ratings of prosecution evidence strength (M = .68, SD = 1.07), ratings of convincingness of the defendant's

alibi (M = .55, SD = 1.01), ratings of eyewitness credibility (M = .45, SD = .76) were all recorded on a nine-point Likert scale and did not differ significantly between experimental conditions. On those grounds, no further statistical tests were conducted on this data.

Discussion

Sixty-seven participants reported not believing they were interacting with real jurors and that the responses were canned and robotic. Six participants were suspicious of the ethnicity and gender heterogeneity among the simulated jurors. Twelve others reported suspicion regarding having to upload photographs of themselves, as well. There were thirteen complaints about not having enough evidence. In light of these results and in relation to the previous iteration, we suspected that establishing believability of an online real-time interface with other mock jurors would be a matter of diminishing returns with the survey software at our disposal.

PILOT STUDY 3

Method

This iteration of the study (N = 12) served as an attempt to preserve the efficiency of an online interface while reducing the incredulity that participants previously displayed in the face of an all-online experiment. This hybridization entailed having groups of six mock juror participants work at adjacent workstations with dividers in a computer lab on the same online interface as in the previous versions of the study, except that the juror photographs were replaced with silhouette icons representing actual spatial arrangement of the others nearby (e.g., the person in seat #3 saw their icon in position #3). The same court case and stimulus materials were used as in Study 1.2. Participants signed up for this study through the University of California, Irvine Human Subject Pool online, filled out consent forms and basic demographic information including age, sex and ethnicity, and made appointments to show up in the lab space

at a set time. Participants were instructed to remain silent throughout the lab experiment because the (artificial) comments would do the talking for them. The icons were programmed to change to reflect whether participants voted for guilty or not guilty verdicts in the public voting conditions; the overall vote distribution was shared in the private voting conditions without any signals from any participant's icon. All six participants in each jury group received this false computerized feedback about each other's votes based on the experimental condition they were assigned to so that they were all run through the experiment in parallel and no confederates were needed. The computerized surveys were programmed with a timer so that all participants in each group would finish at roughly the same time in order to maintain believability about the process. Afterward, participants were given extra credit for the course of their choosing and dismissed.

Results

Eight out of twelve participants were suspicious of the study as one of conformity. It seemed likely that the deliberate separation of the workstations with dividers may have backfired in combination with the silhouette icons on each screen; participants were probably inferring that there was deliberate delivery and withholding of social information that overshadowed the content of the court case at hand. The final votes were evenly split between guilty and not guilty and, despite the incomplete first vote data, there was no evidence to suggest that any participants had changed their verdicts (based on debriefing questions after the experiment).

Discussion

This iteration of the study was abandoned when it became apparent that the laboratory computers were exhibiting errors in loading the various screens of the experiment in a timely manner. Many participants never saw the screen that allowed them to cast their initial votes, nor did they see the votes or comments of their (simulated) peers. Several participants mentioned

never having seen any of the silhouette icon screens that were essential for the experimental manipulation to register. The automated timers were also not as well-coordinated as planned; some participants finished far earlier than others, who were left typing alone in the presence of an idle, silent majority.

General Discussion of Pilot Studies

Taken together, the three pilot studies highlighted a number of methodological challenges associated with using online interfaces. It proved quite difficult to get participants to believe they were in fact interacting with other humans, even when timing the presentation of information was not an issue. The process of fine-tuning the canned comments could have been extended indefinitely to increase the odds of believability slightly, though even this possibility was limited by the fact that participants never engaged in a true back-and-forth dialogue in which comments made by one individual got directly addressed by another. Programming an artificially intelligent chat "bot" to simulate deliberation was beyond the means available for this research and duplicating the simulated dialogue success of Salerno (2012) and Salerno and Peter-Hagene (2015) proved unfeasible with the relatively unaccommodating Qualtrics software available. Given the suspicion associated with the thumbnail photos and the interface in general, the most apparent solution that emerged for yielding optimal psychological realism was running this paradigm in a laboratory setting.

CHAPTER 3:

Laboratory Face-to-Face Study

Laboratory Face-to-Face Study

Method

Participants

Three hundred and thirteen students were recruited from the University of California, Irvine (n = 313, 77.0% female). Their median age was 20 years (IQR = 2 years). This study was approved by the Internal Review Board of the University of California, Irvine. All participants gave written informed consent and were informed of their right to discontinue participation at any time. Participants received their choice of either course credit or remuneration. Sixteen participants were excluded from the final analysis due to their explicitly stated suspicion of confederates in the study. Seventy-two additional participants were excluded from the analysis for being in faulty versions of the private voting experimental conditions[5] that had to be re-run with new participants.

Design

This study used a 2 (public deliberation / private deliberation) × 2 (majority faction / minority faction) randomized factorial design involving a six-person mock jury, five of which were confederates. The dependent variables were 1) the percentage of participants changing their vote after receiving feedback about the other jurors' voting choices, 2) the average change in participant's level of confidence in their decision after deliberation, and 3) the average change in participants' ratings of the strength of the evidence presented against the defendant after deliberation. Much like Deutsch and Gérard's methodology (1955), we manipulated whether participants communicated (during both deliberation and voting) publicly or anonymously (via

[5] The private deliberation conditions originally only featured private *voting* while maintaining public deliberation. Over the course of the 57 participants run through these conditions, it was determined that too many of them were either intentionally or unintentionally revealing their votes or voting intentions to the group, thereby undermining the manipulation. This was the basis for the private deliberation condition in its final form for this experiment, which featured both private voting *and* private deliberation.

computerized systems similar to Hiltz, Turoff, & Johnson, 1989, and other GSS technology as addressed by Mesmer-Magnus & DeChurch, 2009) in order to distinguish the relative contributions of normative and informational influence toward vote switching behavior.

To examine behavior in both low- and high-pressure contexts, the majority opinion was manipulated relative to those of the participants. In the majority faction (control) conditions, four confederates agreed and one confederate disagreed with participants' initial poll verdict, while in the minority faction conditions, only one confederate agreed and four confederates disagreed with participants' preferred verdict. The inclusion of an additional minority member besides the participant in the initial minority faction conditions was intended to reduce suspicion from unanimous opposition and guarantee that both sides of the case were discussed in every deliberation. By the end of each deliberation, the minority confederates capitulated to the group pressure and voted identically to the majority for the final verdict regardless of the participants' votes.

Procedure

At the beginning of each session, participants read informed consent forms and filled out demographic questionnaires. Participants then read juror instructions (including the need to only convict if "convinced of the defendant's guilt beyond a reasonable doubt[6]" – see Appendix C for details) and were asked to read a synopsis of a sexual assault case with arguments from both the prosecution and defense. This synopsis was approximately 800 words in length and designed to have a balance of evidence for both the prosecution and defense. Once the allotted time was up, participants were instructed to both indicate their vote (guilty or not guilty) and provide a Likert scale rating of how convincing the evidence was.

[6] It was beyond the scope of the present research design to manipulate the specific definition of reasonable doubt, though some variations in this term have been associated with fluctuations in conviction tendencies of juries (Koch & Devine, 1999).

In the public deliberation condition, the initial poll was conducted aloud sequentially around the table, with the participant voting first and the confederates modifying their votes accordingly to match the condition that had been randomly assigned to the session. After the votes were cast, a second pass was conducted to have participants briefly state their reasons for why they voted as they did. In the private deliberation conditions, the initial votes were marked on ballots that were handed in, shuffled up, and read out loud by the experimenter, who reported an anonymous vote distribution based on the participants' votes that matched that of the appropriate experimental condition. This allowed the confederates to deduce the votes of participants in these conditions. For instance, confederates in the private, majority faction condition who heard the experimenter report a poll total of five guilty votes and one not guilty vote would know that the experimenter had seen that the real participant voted guilty (and was thus assigned to the majority). The vote justifications in the private condition were written and handed in to the experimenter, who read them out loud. The confederates were trained to write pre-planned comments simply restating non-diagnostic case facts for both verdicts so the experimenter could select the appropriate ones to read to create the proper vote distribution. Having the real participants hear their own comments read aloud was meant to add to the experimental realism during this stage.

Upon completion of the initial poll, participants were instructed to deliberate. Participants deliberated either out loud or silently on their electronic devices by using Padlet.com, free software for creating and managing anonymous online discussion boards. Confederates were trained to only state facts from the case and stubbornly repeat their corresponding opinions so as to avoid adding any new information (e.g., confederates siding with the prosecution said, "The victim recognized the scar on the defendant's neck, so I think the

defendant is guilty.") Confederates were also trained to have a realistic, convincing level of enthusiasm and to avoid excessive vociferousness on the one extreme and mechanically disengaged behavior on the other. Confederate training included a discussion of the importance of maintaining consistent behavior across participant sessions and reminders about this issue were provided over the course of the experiment's data collection phase. Deliberations lasted for a maximum of 20 minutes or were concluded when comments ceased with no sign of restarting. The minority faction confederates were trained to initially resist the majority faction for several minutes before growing quieter, acknowledging the facts raised for that side, and subsequently switching their votes.

After deliberation, participants were allowed to look at the facts once more before delivering their verdict in the same style as their initial poll – the only modification was that the sequence of voting was reversed in public conditions so that participants could see the minority faction confederate switching their vote prior to casting their own vote[7]. Once the final verdict was announced, participants filled out questions pertaining to their satisfaction with the decision and their experiences of interacting with the group. The study concluded with debriefing suspicion questions and participants were then dismissed.

Results

Vote switching: Overview. First, frequencies were calculated for the initial poll and final verdict votes cast by the 225 total participants included in the study. On the initial poll, 109 (48%) voted for a verdict of guilty, while the remaining 116 (52%) voted not guilty. In comparison, for the final verdict, 87 (40%) voted in favor of guilty and 138 (60%) voted not guilty. Next, to assess

[7] The minority faction confederates in the anonymous deliberations were trained to simply admit their views had changed at the end of the group discussion. This was designed to control for the public minority faction confederate vote switch during the final vote in the public conditions.

how vote switching varied as a function of initial vote, the following cross-tabulation was computed:

Table 3.1
Consistency Between Initial and Final Vote

	Final Vote		
First Vote	Guilty	Not Guilty	Total
Guilty	56	53	109 (48%)
Not Guilty	31	85	116 (52%)
Total	87 (39%)	138 (61%)	225 (100%)

This process indicated that 53 participants (24%) initially voted for guilty and switched their votes to not guilty after deliberation, compared to 31 participants (14%) who initially voted for not guilty and switched their votes to guilty. Conversely, 56 participants (25%) maintained their initial vote of guilty through to the final verdict, while 85 participants (38%) maintained their initial vote of not guilty through to the final verdict.

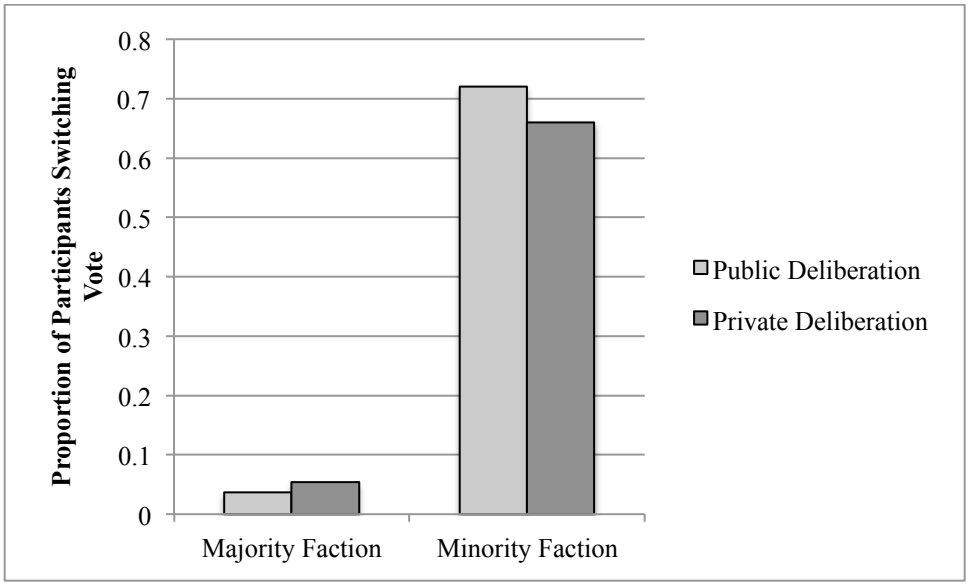

Figure 3.1. Vote switching by experimental condition.

The distribution of vote switching by experimental condition is shown in Figure 3.1. This graph illustrates that participants in minority faction conditions switched their votes far more often than those in majority faction conditions and that rates of vote switching did not differ significantly by public or private deliberation. The next step of analyzing the data consisted of conducting a multinomial logistic regression to determine the predictors of vote change. The dependent variable of vote change was defined trichotomously to account for potential differences in the tendency to favor a particular verdict: the data was divided into outcome categories of 1) switching from a guilty initial vote to a not guilty final vote, 2) switching from a not guilty initial vote to a guilty final vote, and 3) not switching one's initial vote. The independent variables in the regression model were anonymity status (i.e., public or private deliberation condition) and faction condition (i.e., majority or minority faction condition). The covariates included in the regression model were difference scores calculated by subtracting ratings participants issued before deliberation from ratings issued after deliberation – ratings of confidence in one's decisions and ratings of the strength of the evidence against the

defendant were both turned into change scores in this manner. The multinomial logistic regression model incorporating both independent variables and both covariates was statistically significant at the $\alpha = .05$ level (χ^2 (8) = 157.14, $p < .001$). The potential interaction term between the independent variables of anonymity status and faction condition was excluded because it produced singularities in the Hessian matrix and jeopardized the model fit[8].

The multinomial logistic regression model revealed a significant main effect of faction condition: being in a minority faction condition was associated with 37.62 times the odds of switching one's vote from guilty to not guilty (95% CI [11.70, 120.95], Wald = 37.07, $p < .001$) and 70.78 times the odds of switching one's vote from not guilty to guilty (95% CI [8.88, 564.27], Wald = 16.17, $p < .001$). There was no significant main effect of anonymity status (public versus private deliberation) on vote switching for either those switching to not guilty (Wald = .151, $p = .698$) or those switching to guilty (Wald = .01, $p = .992$). Change in ratings of evidence against the defendant was a significant covariate of vote change for both those who switched to not guilty (95% CI [.475, .782], Wald = 15.14, $p < .001$, odds ratio = .609) and those who switched to guilty verdicts (95% CI [1.07, 1.89], Wald = 5.72, $p < .001$, odds ratio = 1.42). The odds ratios suggest that participants who increased their ratings of how strong the evidence was against the defendant were more likely to switch to convicting, and those who decreased their ratings of the evidence were less likely to switch to convicting. Change in confidence ratings was not a significant covariate of vote change for either those who switched to not guilty (Wald = .025, $p = .874$) or those who switched to guilty verdicts (Wald = .746, $p = .388$). In short, majority versus minority faction condition and changes in ratings of the strength of the evidence against defendant were the only predictors of vote change detected by this approach.

[8] Only one participant switched from a vote of not guilty to guilty in the majority faction conditions.

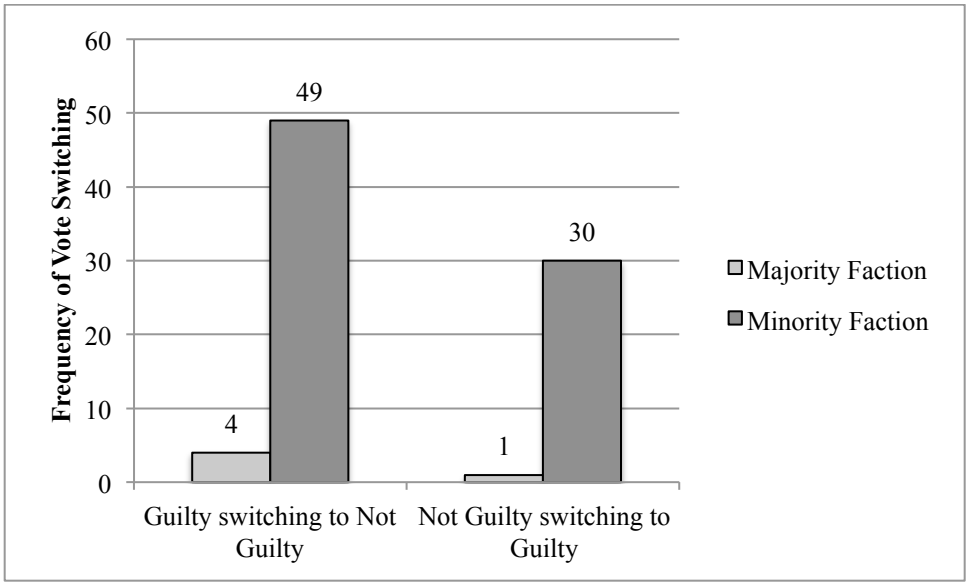

Figure 3.2. Comparison between the frequencies of participants switching from an initial vote of guilty to a final vote of not guilty and switching from an initial vote of not guilty to a final vote of guilty, split by faction condition.

Figure 3.2 shows vote switching in both directions as a function of faction condition and corroborates the logistic regression finding that minority faction conditions yielded far more vote switching in both verdict directions. As a post-hoc analysis to overcome the statistical distortion in the regression model odds ratios from the cell count of only one participant in the majority faction condition who switched from not guilty to guilty, a chi-squared test was also conducted in order to address the possibility of leniency asymmetry bias, the tendency for factions favoring acquittal to secure their preferred final verdict (via vote switching from the opposing jurors) more often than factions of the same size favoring conviction (Kerr & MacCoun, 2012). This test compared the rate of switching one's vote to guilty and the rate of switching one's vote to not guilty. Switching one's vote to not guilty was significantly more common across the four conditions (χ^2 (1) = 11.52, p = .001). This effect held when participants in the majority faction conditions were excluded from the analysis, as well (χ^2 (1) = 6.68, p = .01).

Change in ratings of evidence against the defendant: Overview. This hypothesized mediator variable was assessed via participants' privately recorded responses to the question, "How strong would you rate the evidence against the defendant?" - with a nine-point Likert response scale with 1 being "Not at all convincing" and 9 being "Completely convincing" – both before and after group deliberation. First, descriptive statistics were calculated for participants' ratings of the evidence against the defendant, both during the initial poll and during the final poll. The ratings of evidence against the defendant for the initial poll ($M = 4.79$, $SD = 1.88$) and for the final verdict ($M = 4.92$, $SD = 2.15$) did not differ significantly from each other at the $\alpha = .05$ level ($t(224) = -.90$, $p = .37$) and were significantly correlated ($r = .47$, $p < .001$). However, due to the directional nature of this variable relative to the votes cast by both confederates and participants, the finding that evidence ratings did not change on average at the aggregate level is mostly uninformative because belief changes in opposite directions canceled out, thereby obscuring effects of interest. For instance, a participant casting an initial vote for guilty, giving an initial evidence rating of 8, and then increasing this rating to 9 at the time of the final verdict would be *less* likely to switch votes, while one would expect a one-unit change in the opposite rating direction (e.g., giving an initial rating of 8 and then a final rating of 7) to *increase* the likelihood of switching votes.

To better represent changes in ratings of the evidence against the defendant as a function of experimental condition, the data are graphically split by participants' vote during the initial poll. Average change in ratings of evidence against the defendant (i.e., difference scores yielded by subtracting the pre-deliberation Likert ratings from the post-deliberation Likert ratings) by experimental condition for participants who voted guilty in the initial poll is shown in Figure 3.3. This figure illustrates that these participants found the evidence increasingly indicative of the

defendant's guilt when immersed in a group with a majority faction advocating for a verdict of guilty. The figure also shows that when these participants who initially voted guilty found themselves in the opinion minority, they tended to reduce their ratings of how much the evidence pointed to the defendant's guilt. Additionally, the figure appears to suggest that the magnitude of belief change in either of those directions was greater for participants in public deliberation conditions than those in private deliberation conditions. *Note: these effects and their significance levels are investigated in more detail in the mediation analysis below.*

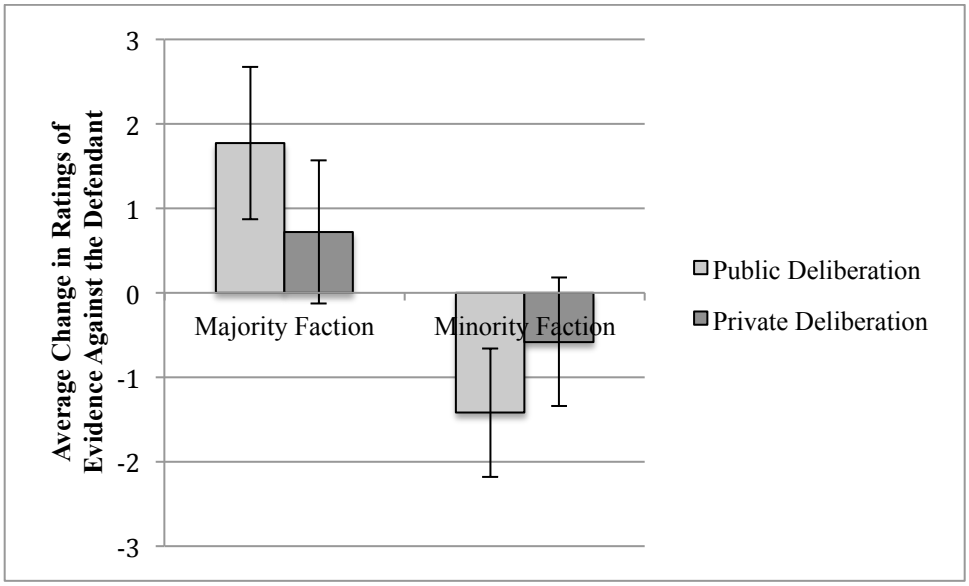

Figure 3.3. Average change in ratings of evidence against defendant by experimental condition for participants who voted guilty on the initial poll. These ratings were based on a nine-point Likert scale; a score of -2 on this graph, for instance, indicates a reduction of two points in how strong the evidence appeared against the defendant over the course of deliberation. Error bars indicate 95% confidence intervals.

Average change in ratings of evidence against the defendant by experimental condition for participants who voted not guilty in the initial poll is shown in Figure 3.4. This figure illustrates that these participants found the evidence less indicative of the defendant's guilt when immersed in a group with a majority faction advocating for a verdict of not guilty. The figure also shows that when these participants who initially voted not guilty found themselves in the

opinion minority, they tended to increase their ratings of how much the evidence pointed to the defendant's guilt. Unlike Figure 3.3, Figure 3.4 suggests that the magnitude of belief change (for participants who initially voted not guilty) in either direction of group pressure did not differ between public deliberation and private deliberation conditions. *Note: these effects are investigated in more detail in the mediation analysis below.*

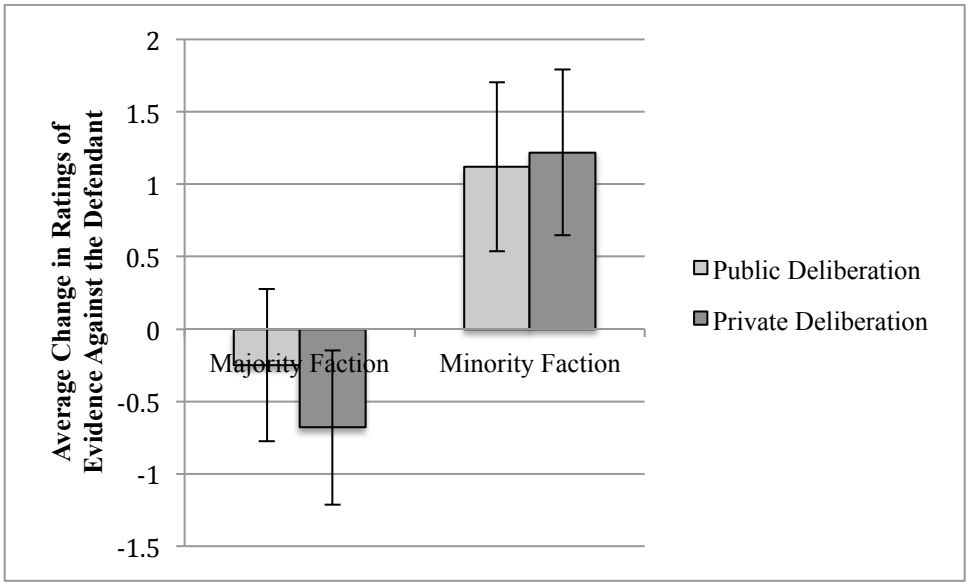

Figure 3.4. Average change in ratings of evidence against defendant by experimental condition for participants who voted not guilty on the initial poll. These ratings were based on a nine-point Likert scale; a score of -2 on this graph, for instance, indicates a reduction of two points in how strong the evidence appeared against the defendant over the course of deliberation. Error bars indicate 95% confidence intervals.

Moderated mediation analysis: Overview. The present objective is to determine the extent to which conformity to group pressure via vote switching occurs because of belief change. This is the question of whether a mediation model with faction condition as an independent variable, change in evidence ratings as a mediator, and vote switching as an outcome (as shown in Figure 3.5) accurately describes the data and underlying phenomena. The question of the extent to

which public versus private deliberation modifies this causal relationship translates to adding anonymity status as a moderator to that mediation model.

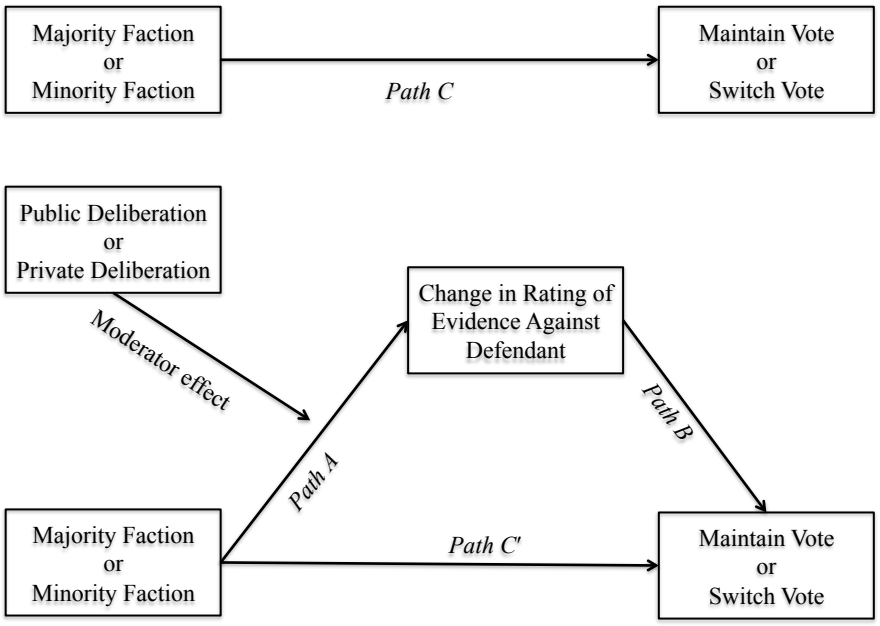

Figure 3.5. Proposed mediation model. If the product of Path A and Path B is statistically significant, mediation has occurred and the strength of the effect represented by Path C' should be less than Path C. The variable of anonymity status (public versus private deliberation) is shown as a potential moderator of the effect of faction condition on belief change.

To assess the relationship between the effect of faction condition (majority versus minority faction), changes in ratings of evidence against the defendant (i.e., the final rating of evidence minus the rating provided during the initial poll), and the binary outcome variable of vote switching (switch or no switch) while acknowledging the directionality issue described above for evidence ratings, a series of hierarchical linear regressions were conducted separately for participants who cast initial votes for guilty and those who cast initial votes for not guilty. This served the dual purpose of confirming that the predictive relationships in the model hold and ascertaining where in the causal pathway the potential moderator of anonymity status would apply, if at all. Though there was no significant main effect of public versus private deliberation

on vote switching in the initial multinomial logistic regression in the previous section, the variable of anonymity status was included in the mediation analyses for its theoretical relevance as a potential moderator of group influence. After conducting these hierarchical linear regressions, the PROCESS mediation modeling macro for SPSS (Preacher & Hayes, 2008) was used to calculate the crucial mediation statistics.

Moderated mediation analysis: Sub-sample with initial vote of guilty. The first step in the analysis of changes in evidence ratings as a mediator of vote change was testing the main effects of faction condition and anonymity status on beliefs about the evidence in a linear regression (Path A in figure 3.5). Change in ratings of evidence against the defendant (operationalized as a difference score between pre- and post-deliberation Likert ratings) was the criterion and anonymity status (public versus private deliberation) and faction condition (majority versus minority condition) were the predictors in the first step. There was a significant main effect of faction condition (t (106) = -5.25, $p < .001$, $\beta = -.455$) but not of anonymity status (t (106) = .06, $p = .952$) at the first step of this regression. When the interaction term between anonymity status and faction condition was added into the model, faction condition remained statistically significant (t (105) = -2.27, $p = .025$, $\beta = -.267$), anonymity status was trending toward significance (t (105) = 1.69, $p = .094$), and the interaction term was statistically significant (t (105) = -2.29, $p = .024$, $\beta = -.354$). This interaction finding supported the notion that anonymity status could interact with the effect of faction condition and function as a moderator at Path A in the proposed mediation model.

Path B in the proposed mediation model (see Figure 3.5) represents the effect of changes in evidence ratings on vote switching when controlling for the effect of faction condition.

Because vote switching is a binary outcome, this step of the analysis required logistic regression. The main effect of change in evidence ratings on vote switching was statistically signficant (Wald = 21.01, $p < .001$, Exp(B) = .559), but the effect of anonymity status was not (Wald = .834, $p = .361$). When the interaction term between evidence change and anonymity status was added to the model, it was not significant (Wald = .415, $p = .52$), nor was the main effect of anonymity status (Wald = .803, $p = .37$), while the main effect of change in evidence ratings on vote switching remained significant (Wald = 8.65, $p = .003$, Exp(B) = .605). This ruled out anonymity status as a potential moderator in Path B.

Path C' in the proposed mediation model (Figure 3.5) represents the effect of the independent variable of faction condition on the dependent variable outcome vote switching once the indirect effect of change in evidence ratings has been controlled for. Once again, because vote switching is a binary outcome, this step of the analysis required logistic regression. The main effect of faction condition on vote switching was statistically signficant (Wald = 36.73, $p < .001$, Exp(B) = 41.51), but the effect of anonymity status was not (Wald = .735, $p = .385$). When the interaction term between faction condition and anonymity status was added to the model, it was not significant (Wald = 2.29, $p = .13$), while the main effect of faction condition remained significant (Wald = 15.56, $p < .001$, Exp(B) = 19.93) and anonymity status remained non-significant (Wald = .776, $p = .378$). This ruled out anonymity status as a potential moderator for Path C′, that is, faction condition's effect on vote switching independent of changed evidence ratings.

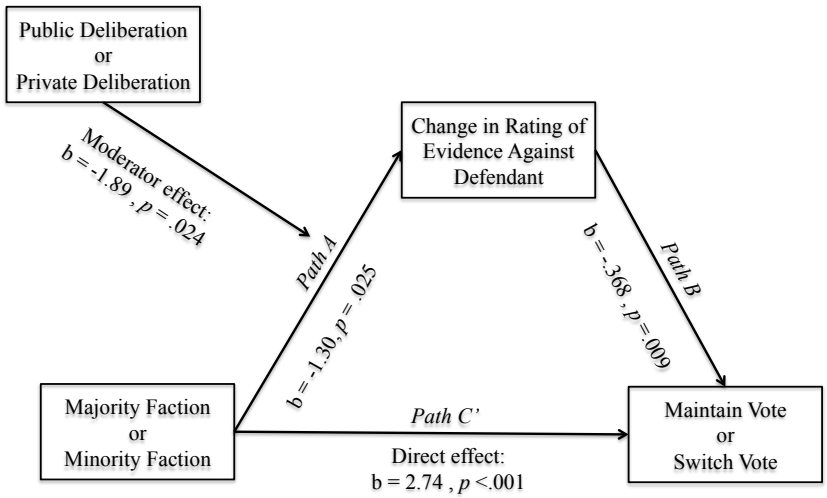

Figure 3.6. Model of changes in evidence ratings as a mediator of the effect of faction condition on the dependent variable of vote switching. This effect was significantly moderated by anonymity status (public versus private deliberation). This model only applies to those who cast an initial vote of guilty.

At this stage, the mediation model with moderation via anonymity status at Path A was eligible to run in the PROCESS macro for SPSS. The relationship between faction condition and vote switching was indeed mediated by changes in ratings of the evidence against the defendant. As Figure 3.6 illustrates, the unstandardized regression coefficient between faction condition and changes in ratings of the evidence was statistically significant (a = -1.30, p = .025) – the negative value of this coefficient indicates that when the group disagreed with participants who initially voted guilty, these participants reduced their rating of how much the evidence pointed to the defendant's guilt. The unstandardized regression coefficient between changes in ratings of the evidence and vote switching was also statistically significant (b = -.368 , p = .009) – the negative coefficient indicates that as participants reduced their rating of how much the evidence pointed to the defendant's guilt, they became more likely to switch their votes. Standardization was not used for coefficients due to the binary nature of the independent and outcome variables (see the

recommendations of Hayes, 2013). Bias-corrected bootstrap confidence intervals based on 5,000 bootstrap samples were entirely above zero for the indirect effect of faction condition on vote switching in both public deliberations (ab = 1.173, [0.295 to 2.82]) and private deliberations (ab = .478, [0.044 to 1.42]). Accordingly, the index of moderated mediation was .695 (95% CI [.044, 2.02]), which represents the difference in the effects of faction condition between the levels of the moderator of anonymity status, namely, public and private deliberation. Because private deliberation was coded as "0" and public deliberation was coded as "1", the positive coefficient indicates that faction condition influenced vote switching via changes in evidence ratings more strongly in public deliberation conditions – the associated confidence interval entirely above zero indicates that this difference between these conditional effects is statistically significant (i.e., the mediation is moderated). Faction condition still influenced the tendency to switch votes independent of its effect on changes in evidence ratings for both public deliberation ($c' = 4.18$, $p < .001$) and private deliberation ($c' = 2.74$, $p < .001$), which indicates that this was a case of partial (as opposed to complete) mediation. The percentage of faction condition's effect on vote switching mediated by changes in evidence ratings for those who initially voted guilty was $(ab)/(ab + c') = (1.173)/(1.173 + 4.18) = 21.9\%$ for those in public deliberation conditions and $(ab)/(ab + c') = (.478)/(.478 + 2.74) = 14.9\%$ for those in private deliberation conditions.

Mediation analysis: Sub-sample with initial vote of not guilty. The process of vetting the relationships between the independent variable of faction condition, the potential moderator of anonymity status, the potential mediator of changes in evidence ratings against the defendant, and the outcome of vote switching for participants who voted not guilty on the initial poll was identical to the one described for the participants who initially voted guilty. Faction condition significantly predicted changes in evidence ratings (t (112) = 4.81, $p < .001$, $\beta = .56$), changed

evidence ratings significantly predicted vote switching (Wald = 10.53, p = .001, Exp(B) = 2.65), and faction condition significantly predicted vote switching (Wald = 17.65, p < .001, Exp(B) = 80.83). However, this series of hierarchical linear and logistic regressions showed no main effects of or interaction effects with anonymity status (public versus private deliberation) for either of the first two regressions. The singularity in the Hessian matrix for the one participant who switched votes despite being in the majority faction made the potential interaction effect for the last of those three regressions unreliable for inclusion in the model. As a result, a simple mediation analysis was used for participants who initially voted not guilty.

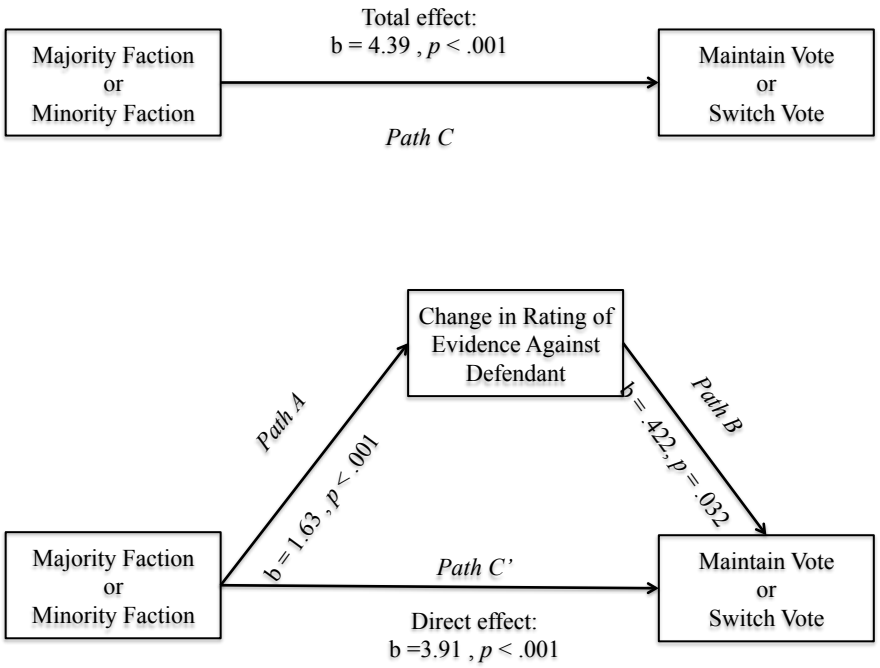

Figure 3.7. Model of changes in evidence ratings as a mediator of the effect of faction condition on the dependent variable of vote switching. This model only applies to those who cast an initial vote of not guilty.

At this stage, the mediation model was eligible to run in the PROCESS macro for SPSS. The relationship between faction condition and vote switching was mediated by changes in ratings of the evidence against the defendant. As Figure 3.7 illustrates, the unstandardized regression coefficient between faction condition and changes in ratings of the evidence was statistically significant (a = 1.63, $p < .001$) – the positive value of this coefficient indicates that when the group disagreed with participants who initially voted not guilty, these participants increased their rating of how much the evidence pointed to the defendant's guilt. The unstandardized regression coefficient between changes in ratings of the evidence and vote switching was also statistically significant (b = .422 , $p = .032$) – the positive coefficient indicates that as participants increased their rating of how much the evidence pointed to the defendant's guilt, they became more likely to switch their votes. Bias-corrected bootstrap confidence intervals based on 5,000 bootstrap samples were entirely above zero for the indirect effect of faction condition on vote switching (ab = .688, [0.072, 1.603]). Faction condition still influenced the tendency to switch votes independent of its effect on changes in evidence ratings ($c' = 3.91$, $p < .001$), which indicates that this was a case of partial (as opposed to complete) mediation. The percentage of faction condition's effect on vote switching mediated by changes in evidence ratings for those who initially voted not guilty was $(ab)/(ab + c') = (.688)/(.688 + 3.91) = 15.0\%$.

Confidence ratings. This dependent variable featured a nine-point Likert response scale with 1 being "Not at all confident" and 9 being "Completely confident". First, descriptive statistics were calculated for participants' ratings of confidence in their vote, both during the initial poll and during the final poll. Confidence ratings for the final verdict (M = 6.13, SD = 2.02) were

significantly higher than those for the initial poll (M = 5.10, SD = 1.91) at the $\alpha = .05$ level ($t(224) = -6.91$, $p < .001$) and these ratings were significantly correlated ($r = .348$, $p < .001$). To test whether the amount by which participants' confidence ratings changed between the first and final vote (i.e., the final confidence rating minus the confidence rating provided during the initial poll) depended on experimental condition, a two-way ANOVA was conducted. Change in confidence ratings (operationalized as a difference score between pre- and post-deliberation Likert ratings) was the dependent variable, anonymity status (i.e., public or private deliberation), faction condition, the interaction term between anonymity status and faction condition were the independent variables. This analysis revealed a significant main effect of faction condition ($F(1, 221) = 28.12$, $p < .001$, partial $\eta^2 = .013$), while anonymity status was trending toward significance ($F(1, 221) = 2.89$, $p = .09$, partial $\eta^2 = .013$). The interaction effect between these two variables was also statistically significant ($F(1, 221) = 5.10$, $p = .025$, partial $\eta^2 = .023$). Figure 3.8 shows how those in majority factions increased in confidence relative to those in minority factions, especially in public deliberation conditions. Note that confidence change was not included in the mediation models above because it did not significantly predict vote switching, unlike changes in evidence ratings.

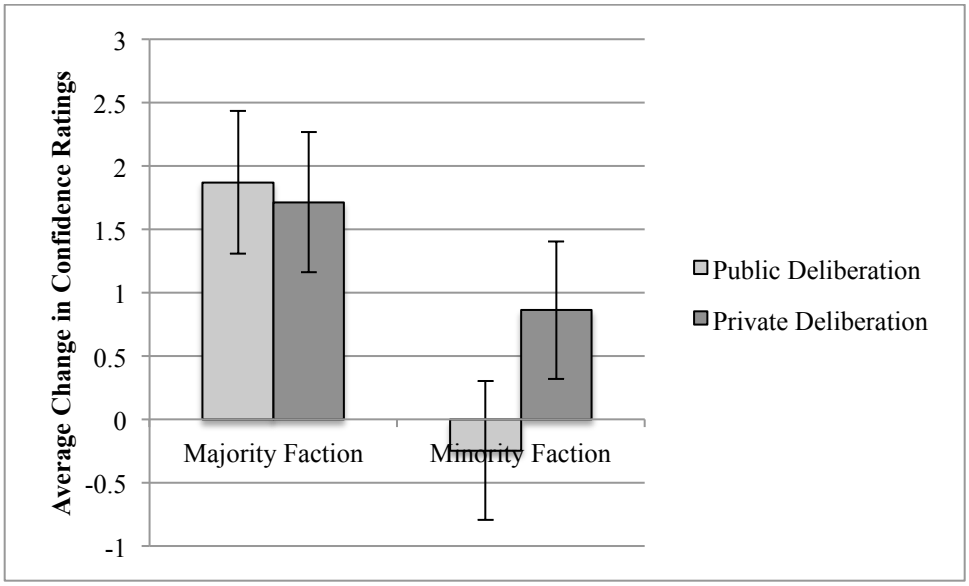

Figure 3.8. Average change in confidence ratings by experimental condition. These ratings were based on a nine-point Likert scale; for instance, a score of 3 indicates an increase of three confidence points in one's decision. Error bars indicate 95% confidence intervals.

Deliberation duration. To test whether the dependent variable of deliberation duration (in minutes) differed between conditions, a two-way ANOVA was conducted to test for effects of the independent variables of anonymity status (i.e., public or private deliberation), faction condition (i.e., majority or minority), and the interaction term between anonymity status and faction condition, as well as the trichotomous covariate of vote choice (i.e., switching to guilty, switching to not guilty, or not switching votes). Vote change was considered theoretically meaningful as a covariate for this analysis because one would expect the process of switching one's vote would take more time in the context of an opposing versus an agreeing majority. This ANOVA revealed significant main effects of both anonymity status ($F(1, 220) = 155.32$, $p < .001$, partial $\eta^2 = .414$) and faction condition ($F(1, 220) = 26.70$, $p < .001$, partial $\eta^2 = .108$), such that private deliberation and minority faction conditions were both independently associated with longer deliberation times, thereby making public majority faction conditions the fastest for deliberations and private minority faction conditions the slowest. This result is represented in

Figure 3.9. Neither the interaction term between anonymity status and faction condition ($F(1, 220) = 2.16$, $p = .143$) nor the trichotomous covariate of vote change ($F(1, 220) = 2.56$, $p = .111$) reached statistical significance.

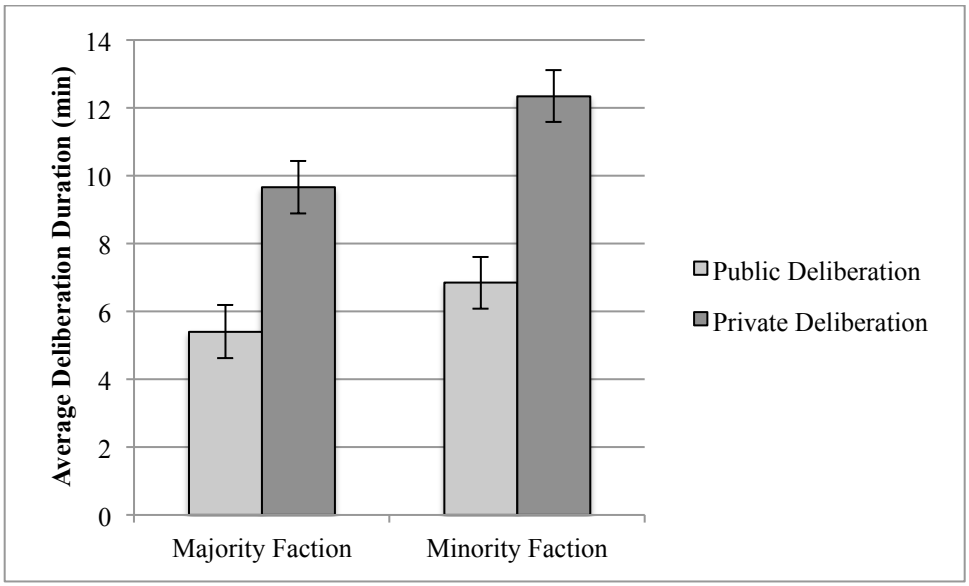

Figure 3.9. Average deliberation duration (in minutes) by experimental condition. This represents the amount of time between the first poll and the end of group discussion. Error bars indicate 95% confidence intervals.

Ratings of being influenced by others. The supplementary debriefing question "To what extent were you affected by what others said?" was collected after verdicts were delivered, but was deemed relevant for reporting. It featured a nine-point Likert response scale with 1 being "Not at all affected" and 9 being "Extremely affected". A two-way ANOVA revealed a main effect of both faction condition ($F(1, 220) = 28.53$, $p < .001$, partial $\eta^2 = .115$) and anonymity status ($F(1, 220) = 4.03$, $p = .046$, partial $\eta^2 = .018$) on this self-report measure of being influenced by others. Figure 3.10 shows how participants in minority faction conditions reported higher levels of being influenced by others, as did those in the public deliberation conditions.

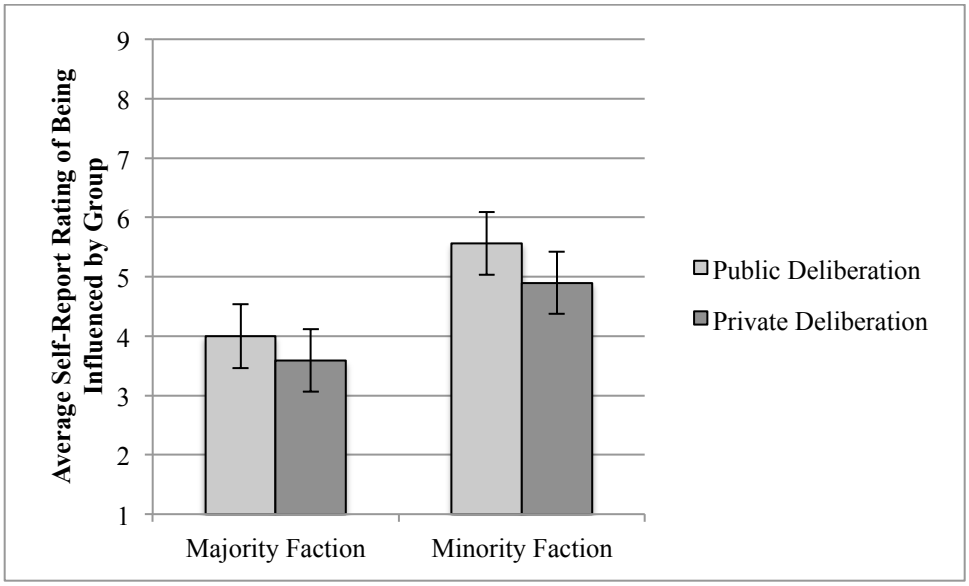

Figure 3.10. Average debriefing self-report rating of being influenced by the group, shown by experimental condition. 1 represents "Not at all affected", 3 represents "Slightly affected", 5 represents "Moderately affected", 7 represents "Strongly affected", and 9 represents "Extremely affected". Error bars indicate 95% confidence intervals.

Demographic Predictors

The demographic variables of gender, ethnicity, religious affiliation, and political party were all recorded at the beginning of the study. None of them emerged as statistically significant at the $\alpha = .05$ level when included as covariates in the analyses above for vote switching, ratings of evidence against the defendant, confidence ratings, and deliberation duration.

Discussion

The present study compared how an individual's voting behavior and ratings of evidence change over the course of deliberation in a mock jury as a function of whether the majority faction agreed with his or her initial vote and whether votes and comments were given publicly or anonymously. Contrary to Hypothesis 1 – the prediction that normative influence would yield more vote switching in public polling situations than in private polling situations – there was no significant difference in vote switching behavior between the two conditions. In agreement with

the predictions of Hypothesis 3, participants switched their votes far more often when the majority disagreed with them. Post-hoc analysis showed that it was more common for participants to switch their votes from guilty to not guilty than from not guilty to guilty; this supports the notion of leniency asymmetry bias, whereby instilling doubt in jurors is easier than instilling certainty (Kerr & MacCoun, 2012).

For participants who voted guilty in the initial poll in the public deliberation conditions, average ratings of evidence strength changed significantly in the direction of the majority opinion over the course of deliberation. For participants who voted not guilty in the initial poll, average ratings of evidence strength also changed significantly in the direction of the majority opinion for all conditions except for the public majority faction condition. Mediation analysis revealed that vote switching was partially mediated by changes in evidence ratings regardless of participants' votes on the initial poll. For those who initially voted guilty, though, this mediation was moderated by anonymity status such that changes in evidence ratings mediated vote switching more strongly for those in the public deliberation conditions than those in the private deliberation conditions. This is the opposite of the prediction of Hypothesis 2, namely, that changes in evidence ratings would mediate vote switching in response to faction condition more strongly in private deliberation conditions than in public deliberation conditions. This prediction was founded on the assumption that private polling was dominated by informational influence and shielded from normative influence; conformity due to social desirability motives was expected to reduce the need for changes in beliefs in public polling relative to private polling conditions. That the data displays the opposite effect, at least for participants who voted guilty on the initial poll, suggests that publicly stated information may be weighted more heavily as it is encoded in participants' minds, thus driving greater belief changes despite conveying the same

factual content. This notion is corroborated by the fact that participants in public conditions reported higher ratings during debriefing of how influenced they were by the group, though this particular measure carries the limitations of potential response bias.

Average ratings of confidence in one's vote choice increased over the course of deliberation for all conditions except the public minority faction conditions. The magnitude of this increase was greater when participants were part of the initial majority faction, suggesting that the awareness of having like-minded peers reinforces confidence in one's contribution to group decisions. The discrepancy between average changes in confidence ratings between the public minority faction condition and private minority faction condition may indicate that confidence levels react primarily to normative concerns about social desirability of views. This is noteworthy because the prompt, "Please rate your confidence in your decision," does not explicitly refer to social confidence and was intended to be more of a self-assessment of judgmental accuracy. That participants in the private minority faction conditions increased their ratings of confidence despite being opposed by the majority may suggest that their awareness of being anonymous quelled their concerns about social acceptance and that this security afforded them the comfort to invest in their initial opinion and continue asserting it. Additionally, those in the private minority faction deliberation conditions who did switch their votes may have been motivated by informational influence, increasing their confidence upon aligning their vote with that of the majority.

Private deliberations lasted longer than public deliberations, suggesting that the former takes more time to achieve cognitive consensus and that nonverbal social cues and additional normative pressure in public deliberation may accelerate agreement. Deliberations lasted longer when participants found themselves in the minority faction, indicating that participants resisted

opposing group pressure longer on average than the dissenting confederates were trained to do (i.e., six to eight minutes). That privately deliberating minority faction conditions took the longest to deliberate suggests that anonymity may allow jurors to stand up for themselves longer before potentially capitulating to the majority.

Limitations

As with most experimental laboratory research, external validity concerns stand at the forefront of this study's list of limitations. Mock juries are inherently simulations and are not experientially equivalent to real juries in terms of their duration, severity (due to the lack of a real defendant) and depth of discussion, degree of individual commitment to delivering justice, vividness of testimony and evidence presentation. A meta-analysis by Bray and Kerr (1979) suggests, however, that the social psychological effects in both real and mock juries are consistent and do not differ reliably. Bray and Kerr assert that all methodologies have their unique strengths and require compromise; deliberation simulations that resemble those of the present study should not be dismissed *a priori* and do indeed have value for examining basic social processes inherent in jury deliberation.

One noteworthy procedural discrepancy between real juries and the present experimental paradigm was the absence of a foreperson. The role of foreperson no doubt entails additional responsibilities and wields social influence over other jurors via authority and administrative duty in a manner that did not arise in this research. The presence of a leader in group discussions about ambiguous stimuli reduces perceived freedom to make extreme initial judgments and often leads to reduced conformity via weakened initial conditions for group polarization (Bovard, 1951). Forepersons also tend to dominate group discussions (Devine, 2012), which may bias the holistic direction of group influence in favor of their position. Inclusion of a leader also interacts

with online deliberation modalities such that status differentials matter less and members contribute more evenly when groups communicate via email (Dubrovsky, Kiesler, & Sethna, 1991).

Other departures from real jury behavior in the present experimental protocol involve timing issues. Field study estimates suggest that only 6% to 31% of real juries take immediate initial polls after the presentation of evidence (Devine et al., 2004; 2007; Sandys & Dillehay, 1995), though the alternative of starting deliberation prior to polling potentially biases those polls from being accurate proxies for pre-deliberation opinions (Salerno & Diamond, 2010). Frequency of polling also differs between real and mock juries, as real juries are not limited to two polls as in the present studies. Duration of deliberation also warrants consideration, as mock jury studies often require truncation of discussion for logistical purposes, whereas real juries have far more time to potentially arrive at consensus. This explains why real juries hang at a rate of approximately 10% or less while mock juries hang 21% of the time (Devine et al., 2001; Salerno & Diamond, 2010).

Idiosyncrasies of the case and protocol used in the present study necessitate some caution when generalizing the effects seen to other jury trials. For example, limited time and resources prevented the present design from being implemented with multiple cases to increase generalizability. Even details as small as the specific definition of reasonable doubt provided to jurors or the option of conviction on lesser charges can impact the tendency to convict (Koch & Devine, 1999). Though conformity effects are generally proportional between six- and twelve-person juries, larger juries tend to hang more often (Kerr & MacCoun, 1985) and have less minority participation (Kessler, 1973). Particular demographic characteristics of the defendant (e.g., ethnicity or perceived socioeconomic status) also interact with juror demographics to yield

different likelihoods of conviction (Perez, Hosch, Ponder, & Trejo, 1993; Jones & Kaplan, 2003). More generally, impression formation literature suggests that jurors may unintentionally incorporate irrelevant factors with haphazard weighting into their evaluations of the case and that these evaluations may even differ as a function of presentation order (e.g., Kaplan & Kemmerick, 1974). Perhaps the most crucial point about the case used in this mock jury research is that the balance of evidence between the prosecution and defense affects the extent to which jurors may rely on informational influence. A case that yields 50% guilty verdicts and 50% not guilty verdicts in individual pilot testing is ambiguous in its afforded interpretations of facts and therefore will prompt jurors to rely more on informational influence than a heavily skewed case. Accordingly, one would expect normative pressure to prevail less than in the traditional Asch (1951) paradigm.

Consistency and feedback effects also may complicate the inferences that can be drawn from the present findings. Even though public deliberation conditions subject participants to higher normative pressure, public polls can also play a role in reducing conformity by binding individuals to their stated opinion due to a desire to "save face" and maintain an image of independence (Fisher, Rubenstein, & Freeman, 1956; Kelley, & Volkart, 1952; Kiesler, 1971). The social stakes are effectively higher in public deliberation conditions, which means that different processes may have accounted for the levels of vote switching seen for public versus private conditions despite the lack of statistical difference between them. If psychological forces in opposite directions (e.g., normative pressure to conform by switching votes and normative pressure to make one's opinions appear consistent by not switching votes) cancel out for dependent variables in the public deliberation conditions, this could numerically match data reflecting a (hypothetical) complete lack of such forces in either direction in the private

deliberation conditions. The lack of significant differences between vote switching in the public and private conditions could thereby potentially obscure qualitatively different processes at work in each. The best one can do with the present resources is to calculate the percentage by which the effect of faction condition on vote switching is mediated by changes in evidence ratings and how this percentage differs between public and private deliberation conditions. Whether an attenuated version of the public commitment effect (i.e., reduced conformity after stating an initial opinion) occurs for simply writing one's vote during initial private polling is unclear. It was also unfeasible to control the exact degree of participant contribution to deliberation in the present research, which may affect one's tendency to internalize the views of others in the group (Greenwald, 1968).

Limitations of the Likert scale instrument employed must be acknowledged, as well. The particular instrument chosen for this research may have caused underreporting of belief change if participants responded to the numeric framing by gravitating toward the midpoint, thereby masking subtle fluctuations in their beliefs (Garland, 1991). Though the extent to which participants recalled their initial responses by the time of the final vote is unknown, they may have also felt the need to feel some combination of consistency and independence from group influence. Consistency with one's previous answers and presentation of one's views as unchanged by deliberation both correspond to systematic underreporting on measures of belief change. Such mechanisms suppressing changed ratings of evidence may have even differed between the four experimental conditions – for instance, participants in the public conditions may have felt more of the pressure to appear consistent for social desirability motives while participants in the private conditions may have felt more pressure from their self-concept of independence, but the different causes of underreported results would be undetectable. While it

is encouraging for the validity of this measure that participants reported varying degrees of belief change across the experimental conditions, the proportionality of their numeric responses to their actual cognitions is difficult to ascertain (e.g., beliefs may not actually change in entirely linear increments).

CHAPTER 4:

General Discussion

General Discussion

The present research was an attempt to methodologically tease apart normative and informational influence to understand their relative contributions to vote switching and belief change during group decision making. Its manipulation of majority faction votes successfully triggered participant conformity in the direction predicted by extensive research in the tradition of the Asch (1951) paradigm. The effect size of this group pressure finding (i.e., an odds ratio over 30) was extremely large for behavioral research and a useful contribution to group decision making literature in the degree of experimental control with which it was derived. Previous work relied almost exclusively on mathematical models or groups of freely interacting participants, both of which limited the focus of inferences drawn to the level of group performance rather than the experiences of individual members. The use of in-person confederates makes this research one of the first instances of experimentally manipulating and controlling peer opinions during face-to-face group decisions, which adds a new level of causal explanation to our understanding of the conformity phenomena at hand.

Implications for Social Psychology

The present research revealed a surprising lack of differences in conformity via vote switching between the public and private deliberation conditions. This finding violated expectations originating from central conformity literature by Asch (1951; 1952b; 1955; 1956), Crutchfield (1955), and Deutsch and Gérard (1955), which all describe public response situations as subject to higher total social pressure and therefore more conducive to conformity than private response situations. Interpretation of this discrepancy does not necessitate overthrowing previous theory; rather, the present findings highlight the notion that Asch-like paradigms focusing on individual decisions made in parallel may reflect less process complexity than group

decisions, which are ripe with feedback cycles that occur over the course of deliberation with peers. Indeed, the present findings can be integrated into the existing framework of normative and informational conformity by identifying the various unique pressures inherent in group decisions that mask the general tendencies that would otherwise be observed for individual decisions made in the presence of others.

For instance, it may be an error to view public deliberation as a simple additive change to private deliberation, rather than its own unique gestalt experience with a different composition of decision inputs and conformity forces. Public deliberation necessarily entails some attention to speakers, which can trigger countless minute judgments known as "thin slices" (Ambady, Bernieri, & Richeson, 2000). When speakers are identifiable, a rich network of nonverbal cues (e.g., appearance, with potential stereotypical indicators of credibility) and behavior (e.g., body language conveying confidence or timidity) are paired with the spoken words and available for incorporation into participants' social cognition. As discussed in the previous chapter, having to publicly state one's position to the deliberating group also activates the conflicting pressures to both produce desirable responses (e.g., the same opinions and votes as the majority) and display socially desirable characteristics (e.g., consistency and confidence in one's views). The exact steps and sequence of such internal calculus are difficult to ascertain when the primary form of data collection requires participants to cross the threshold of committing views, albeit *pro tempore* ones, to paper.

The lack of differences in vote switching between the public and private deliberation conditions in the present research stands in interesting contrast with the findings pertaining to changes in participants' ratings of the strength of the evidence against the defendant. That the direction of the average change in beliefs matched the position advocated by the majority in all

conditions attests to the efficacy of the group pressure manipulation and is unsurprising. However, at least for participants who voted guilty on the initial poll[9], beliefs changed more in public deliberation than in private deliberation and belief change mediated the effect of group pressure on vote switching more strongly in public deliberation than in private deliberation. Evidently, it was an error to expect that the sole source of normative influence lay in the amount of vote change by which public deliberation would have hypothetically exceeded that of private deliberation. That faulty hypothesized model treated normative influence in public deliberation conditions as an addendum to a baseline amount of purely informational influence. Its validity hinges on the notions of anonymity as an airtight safeguard against normative influence and exacerbation of conformity in public situations. The relatively low percentage of the majority faction effect on vote switching mediated by changed beliefs about the evidence in all conditions suggests information about the case was not the main force driving participants' voting behavior.

Rather, normative influence may be so powerful that even private voting will not completely shield people in group decision situations from it at the most basic level. Participants may have feared being the source of obstructionism regardless of accountability. Indeed, anonymity does not reduce the possibility of one's group feeling disappointed about a hung jury outcome if the vote totals were close to unanimity. While normative conformity is typically characterized as the desire to fit in while perceived by others, private adherence to social norms about not angering or disappointing others whenever possible also qualifies as ultimately normative in origin. If sufficiently compelling, this norm of not inconveniencing others due to "social conscience" alone could produce the observed rate of vote switching regardless of public

[9] Leniency asymmetry bias (Kerr & MacCoun, 2012) may have suppressed potentially different mediation percentages between public and private deliberation conditions for participants who initially voted not guilty due to increased resistance to arriving at guilty verdicts. This may also explain why participants who initially voted guilty in the public minority factions changed their ratings of the evidence more than those who initially voted not guilty.

or private deliberation status. Thus, a major result of the present research is the ironic finding of questioning the efficacy of the paradigm used to separate normative and informational influence via anonymity and private voting.

Furthermore, because confederates shared the same fact-based assertions in both public and private deliberation conditions, it is not the case that participants in the public conditions simply received more compelling factual information pertaining to the evidence. Rather, one may conclude that people may weight a given piece of information more heavily[10] when the speakers and listeners are not anonymous. Another way to formulate this is to state that public deliberation conditions may increase susceptibility to informational influence. Accordingly, one may either posit that public deliberation increases *both* normative and informational pressure or that the two constructs in the conformity dichotomy are more conjoined than they are traditionally portrayed in social psychology literature. Myers, Bach, and Schreiber's (1974) assertion that information influence does not occur with social comparison scenarios may have been one such overstatement. Isolating informational influence completely from normative influence may be impossible due to human sensitivity to even the subtlest social facets of situations. Many given norms can be framed as either normative or informational and, depending on the motivations of the individual in question, may be treated as a hybrid of the two upon subjective construal. For example, in seeking the "correct" response to a prompt (e.g., having to vote for a verdict), participants may initially use social referencing to determine which responses are socially acceptable or favorable (a normative consideration), which may then bias and guide their subsequent search for accurate views or optimal choices (informational goals).

[10] It is unclear whether those in public deliberations tend to overreact to a given piece of information because of its social embeddedness or whether those in private deliberations undervalue that information due to a lack of identifiable source. These possibilities may even be shown to not be mutually exclusive if some appropriate objective rational response to the information could be calculated.

In this manner, normative processes can fuel informational influence – indeed, perceived normative behavioral scripts are information in themselves and no choices are made in a social vacuum when the ability to imagine the views or reactions of others is taken into account. A strict cognitivist might even go so far as to say that all conformity is fundamentally informational and that what is traditionally considered normative conformity can be reformulated as simply looking to others for accurate views about what is socially acceptable.

This perspective offers the potential of integrating conformity theory with the notion of biased assimilation, whereby individuals tend to accept information that matches their attitudes and values (one of which is being socially accepted) more readily than information that contradicts their preferences (e.g., Lord, Ross, & Lepper, 1979; Munro & Ditto, 1997). Brandstatter, Davis, and Stocker-Kreichgauer (1982) point out a more iterative version of this notion for information sharing in groups: the most popular views during discussion put normative pressure on group members, which causes them to filter their comments to match the social desirability norm, and then the burgeoning norm serves as informational pressure for belief change. Informational consequences of normative conformity also align with self-justification (Festinger & Carlsmith, 1959) and cognitive dissonance reduction models (Festinger, 1962) because they can couple normative compliance with informational justification.

Cognitive consistency theories may also capture bidirectional effects and patterns of convergence between overt choices and attitudes. Beyond the commonsense notion that evidence informs judgments, judgments in progress shape the way new information and evidence is processed, resulting in greater agreement between the evaluation of the evidence and the final judgment delivered (Holyoak & Simon, 1999; Simon, Pham, Le, & Holyoak, 2001; Read, Snow, & Simon, 2003; Simon, Snow, & Read, 2004; Simon, 2004). When individuals are free to

evaluate evidence and make decisions, dependent measures representing each of those constructs will tend to converge and cannot necessarily be expected to vary independently. This maps fairly closely onto the situational features in the present research in that 1) pressure from the opinion of the majority faction facilitated changes in ratings of the evidence, and 2) changes in ratings of the evidence facilitated submission to the pressure majority's preferred vote. This again leads to the notion that normative and informational forces will converge and that whichever form takes hold first can facilitate or even fuel the other, thereby making their isolation very difficult, if not impossible.

Implications for Jury Protocol

With respect to applications for jury protocol, the present research is perhaps a combination of reassuring and resigned to the status quo. On the one hand, it appears that there is no quantitative difference in the prevalence of vote switching outcomes between public and private polling schemes in jury decisions for criminal trials. Given that jurors have a great deal of procedural leeway while deliberating, the lack of systematic differences in outcomes between polling schemes provides some relief for those seeking to reform the judicial system by implementing an entirely private voting deliberation protocol nationwide. Though reducing the amount of extraneous information that jurors have to process seems like a logical step toward optimizing jury decision making by minimizing sources of bias, as a priority for legislation, the minimal impact of such an intervention must also be considered when conducting triage of the whole system.

On a more concerning note, the present research provided a powerful demonstration of robust conformity in voting behavior despite its enhancement of the best safeguard commonly used, namely, secret ballots. Actual juries do not go to the trouble of making the entirety of

comments issued by all jurors anonymous and it is troubling that conformity effects consistently permeated the process despite this extra precaution. Conformity thus appears to be an inevitable source of collateral damage incurred when trying to stabilize individual judgments through a honing process with a group. At the level of systems theory, any further attempt to protect jury decisions from conformity symptoms, such as issuing stronger warnings prior to deliberation about conformity or even mentioning psychological research on social influence in an effort to increase resistance to one's peers, may only increase the hung jury rate, use up time and money, and iterate deliberations through re-trial until enough people do conform to successfully deliver a verdict.

Given that some level of agreement in votes is built into both majority rule and unanimity rule and that alignment of votes is behavioral evidence of conformity, conformity appears inextricable from judicial system paradigms that involve juries. Though it is tempting to reframe juror conformity as healthy cooperation, the rather low percentage (15% to 22%) by which changes in beliefs about the evidence mediated changed votes in response to majority pressure in all conditions within the present research highlights the likely possibility that juror agreement is mostly normative in nature. Whether it is possible to establish some jury protocol with belief changes fully or almost fully mediating vote choices relative to the group is unclear at this point.

Future Directions

There are several methodological considerations that future research should incorporate to continue elucidating the research questions examined here. As with any approach, there are strengths and weaknesses to be found regardless of where a given study lands on the spectrum of naturalistic observation to strictly controlled experiments. The present study was quite useful for examining questions of effect size, as with its odds ratios upwards of 30 for switching votes

when facing an opposing majority. Because the present experimental design relied on participants' choices and their behavioral responses to the situations choreographed for those choices, future research building on it ought to use a sample large enough to represent unlikely behaviors like the occasional switching of votes in majority faction conditions.

While on the issue of sampling, it is apparent that future research would benefit from diversifying its sample beyond university students, who are notorious for being relatively westernized, educated, industrialized, and Democratic compared to the rest of the world's population (Heinrich, Heine, & Norenzayan, 2010). Given the need for confederates in a laboratory setting, this may prove challenging and entail recruiting within communities, which still does not cleanly address the geographic constraints. Resorting to remote methods to quickly boost sample size (as in Pilot Studies 1 and 2) inevitably requires some loss of experiential immediacy, so that trade-off should be regarded cautiously.

Barring the technological breakthrough of covert brain scans with sufficient power to detect and interpret privately held thoughts and feelings, future research will continue to grapple with the limits of self-report measurements. As discussed above, when dependent variables are registered on paper or committed to writing, they can evoke their own set of problematic demand characteristics. They can unintentionally bring certain ideas more to the forefront of awareness (thus disturbing the pre-measurement mental state), produce commitment and consistency effects, prompt self-presentation bias or rationalization (e.g., reduce the tendency to report what could be perceived as irrational motives and encourage confabulation), misrepresent participant views with framing effects like anchoring and adjustment or exhibit memory flaws (e.g., primacy and recency effects), and perhaps even make participants feel more pressure (e.g., people often feel that written contracts are more binding than verbal agreements). Audiovisual recording of

participant behavior could be used to augment self-report measurements in order to provide a more nuanced and dynamic account of participant emotional patterns over the course of deliberation. For example, video recordings could be coded for body language or facial expressions indicative of particular emotions (Ekman & Rosenberg, 1997). Even so, however, such approaches would miss important elusive variables not quantified in the present research, like the extent of counterarguing by participants against the positions advocated by majority factions. In a prescient discussion of the challenges of capturing counterarguing for research purposes, Miller and Baron (1971) suggest that the very act of arguing for a particular position on an issue can cognitively impact one's own level of belief in addition to signaling resistance to attitude change. This argument can be done aloud or silently and privately if an individual does not wish to reveal his or her mental state and therein lies the insufficiency of the tempting solution to only record what is spoken over the course of deliberation. Furthermore, self-report for this variable and others like it is fundamentally limited by individuals' lack of introspective insight (Nisbett & Wilson, 1977) and the notion that prompts can promote arguments where there were none. As for verbal responses recorded with traditional methods like Likert scales, future self-report approaches to the research questions explored here would at least do well to undergo validation testing to reduce concerns relating to ceiling or floor effects.

The other central methodological concern for future research in this vein is striking a balance between psychological realism and experimental control. As discussed in the previous chapter, the experience of participating in the present research differed from that of real jury trials in its exclusion of a foreperson and the foreperson selection process, in the detail and vividness of the case materials to be evaluated by the jurors, and in its predetermined polling structure and greatly reduced duration. Rigging the selection of a foreperson would be

particularly difficult and the experience of partaking in that process could have its own set of effects that could obscure the phenomena of interest despite better matching real-world protocol. Outgoing, socially dominant participants who would normally pursue leadership positions could be either disappointed by not being elected foreperson or – if the experiment allowed them to be elected – would dictate the group's discussion and decision in a manner not amenable to standardization. The level of detail and vividness of the case materials are perhaps most easy to improve: with the appropriate permissions and enough resources, one could use all the evidence from a real court case, though this would require a tremendous amount of time for participants and their confederate counterparts to process if it were to match a real trial in duration. An important but inaccessible missing ingredient to vividness is the belief that one is actually deciding the fate of a real defendant – scientific ethics prohibit that level of realism.

Deliberation duration is certainly linked quite closely to the quantity, detail, and complexity of the evidence at hand – participants in the present research who reached a natural ending point of discussion may have been willing to say more with a more extensive case file. Furthermore, truncating the experimental deliberation at the 20-minute mark may have led to masking the possibility that participants who did not switch votes by the end of the experiment might have done so given more time to be exposed to the opposing majority. In that sense, the present research may actually underestimate the rate of conformity that occurs in longer deliberations, suggesting that maximum deliberation duration ought to be manipulated to clarify the extent of the effect. Such a study could theoretically prove useful in plotting an asymptotic utility curve for vote switching as a function of time: courts could allot a particular amount of time for deliberation associated with a particular pre-selected statistical confidence level for no further vote switching.

Another central methodological issue for future research to address is that of control and standardization. Because of the unpredictable nature of real interactions with participants' comments, there was some flexibility in the course of deliberation. Confederates could not simply recite memorized lines, which would inevitably be incongruous with each participant's unique contributions and questions. Though confederates were trained to maintain a consistent tone across participant trials and confine their comments to assertions of opinions based on the limited facts provided in the case, variations in talkativeness of participants could have led some to hear a greater total of opinion and fact pairings from confederates than others. Transitional, ancillary speech differed incidentally from session to session in order to maintain coherent conversation and prevent comments from sounding too robotic. This would only become exacerbated and more difficult to regulate had the present study used a larger jury with up to twelve members. A goal for future research is incorporating the tightly scripted content of online simulated deliberation by Salerno and Peter-Hagene (2015) into a believable in-person paradigm. In light of the group polarization literature and belief change as a variable of present interest, researchers should be also mindful of accounting for whether the majority faction simply maintains or ostensibly intensifies its views. To accommodate a greater range of natural opinions, investigating scenarios where the majority of jurors overtly express feeling undecided about the facts would offer useful diversification of the more simplistic pro-prosecution or pro-defense stances typically used. Of course, the greater the acting range required for the confederate roles, the more resource-intensive training will be and the more difficult conversational choreography and its proper execution will be.

Given the goal of the present research to combine behavioral and cognitive measures to triangulate jurors' motivations for switching their votes, the future of such work must entail

stronger cognitive components. Salerno and Diamond (2010) along with Kerr and Tindale (2004) rightfully suggest that further jury decision making research must explore how group dynamics interact with cognition as it pertains to topics including recall performance, error and bias correction, analogical reasoning, heuristics, and judgments of their peers competence. The key to such efforts will be economy of design and unobtrusive materials, as a cumbersome battery of measures can distract from the more typical deliberation procedures of interest or potentially feature items that interact with each other unpredictably. In that sense, research on the behavior and cognition of jurors resembles the Heisenberg uncertainty principle in quantum physics in that the act of measuring variables of interest may alter other important components of the relevant phenomena. This suggests the solution must entail diverse methodology to arrive at a piecemeal understanding of the mechanisms at work if they are too complex to control or measure simultaneously in their entirety.

Unanimity Versus Majority Decision Ruling

Besides the issue of public versus private voting explored in the present research, the variable of decision rule, namely, whether the criterion for a group's decision is unanimity or majority rule, has intuitively plausible psychological effects on the nature of group decisions and ought to be explored in future jury decision making research. Unanimity rule requires complete cooperation and conformity from the group members in order for a decision to be made. Accordingly, dissenting individuals find themselves embedded in a social system with distinct normative pressure, which promotes awareness of being perceived as obstructionists. In contrast, group decisions made with majority rule lack the obstructionist stigma for dissenting minority members and thus the relationship between factions is likely less intensely adversarial. Majority faction members will not perceive a relatively substantial threat to their ability to

determine the outcome of the group decision, though minority faction members may experience dismay at their own lack of power (Kameda, 1991; Tayor-Thompson, 2000). Not surprisingly, juries have significantly shorter deliberations (Davis et al., 1975), are more likely to be verdict-driven, and are less likely to hang when permitted to reach majority rule verdicts (Devine et al., 2001; Hastie et al., 1983; Kerr et al., 1976; Davis et al., 1997). Pragmatic benefits aside, critics argue that this comes at the price of undermining consideration of minority viewpoints (Hans, 1978; Abramson, 1994) and lowering jurors' self-reported confidence in their decisions (Nemeth, 1977).

Minority perspectives play a crucial role in fostering more thorough discussion of evidence, as demonstrated by the finding that juries composed of only death-qualified jurors (those permitted to serve on capital punishment cases) are less critical of witnesses, less able to remember evidence, and more likely to convict than mixed juries (which include "excludable" members who oppose the death penalty) (Cowan, Thompson, & Ellsworth, 1984). On the other hand, critics on the opposing side of the decision rule issue have made statistical arguments based on strategic voting concepts to suggest that the unanimity requirement increases the probability of convicting an innocent defendant and acquitting a guilty defendant (Feddersen & Pesendorfer, 1998). Saks (1977) asserts that neither unanimity rule nor majority rule lacks flaws or issues addressed more strongly by the other – a perfect decision rule is therefore elusive. Given the prevalence of both of these two decision rules in courts and other domains around the world, a comparison of their effects on group decision making vis-à-vis normative and informational influence is warranted.

Diamond, Rose, and Murphy's (2005) landmark observational studies in the Arizona Jury Project examined the deliberation experiences of jurors pertaining to the decision rule in place.

Kameda (1991) had furnished liminary evidence that mock jurors perceive deliberation to be fairer and more complete under unanimity rule. Concordantly, Diamond et al. (2005) found that real juries operating under unanimity rule gave higher ratings of the thoroughness of their group decisions and their fellow jurors' openness to new ideas. Additionally, they noted that majority rule juries with eventual holdouts were twice as likely as unanimity rule juries to have a member mention the voting threshold. This finding may suggest that drawing attention to the non-unanimous nature of majority rule decisions may reduce the group's motivation to resolve disagreements and limit the potential for cognitive consensus.

Mohammed and Ringseis (2001) defined cognitive consensus as shared conceptualization and assumptions about the issues to be decided and found with their own mock juries that unanimity rule achieved higher rates of cognitive consensus and satisfaction with the decision than majority rule. This corroborates Stasser and Davis' (1981) finding that majority rule allows members to disagree with ultimate group decision and yields larger numbers of agreeing members who are uncertain. Diamond et al. (2005) also found that holdout jurors were not unreasonable or abnormally stubborn: in every case, judgments about the credibility of the witnesses or different interpretations of the judge's instructions were the source of the conflict between the majority and the holdouts. The impression that emerges is that holdouts in group decisions are not necessarily contrarians reacting to the perceived normative pressure, but rather, objectors with sufficiently strong concerns that they feel compelled to voice their differing views despite the social discomfort entailed.

Kaplan and Miller (1987) conducted one of the most prominent studies of normative and informational influence as a function of the type of issue and the assigned decision rule. The authors drew a distinction between judgmental issues, which entail deciding on a morally

appropriate position, and intellective issues, which involve attempts to arrive at a correct answer. They found larger shifts in voting – essentially, greater conformity - for judgmental issues decided by unanimity rule, but less satisfaction with the process and outcome for judgmental issues requiring majority rule. Content analysis suggested that intellective issues produced more informational influence, while judgmental issues elicited more normative influence. Though the authors make the valid point that normative and informational influence often operate simultaneously during deliberation, much like Stasser et al. (1984), they had participants use private ballots and therefore limited the extent of normative influence possible. Additionally, the content analyses were performed based on the utterances of the group members, which leaves some ambiguity regarding the manner in which they were psychologically internalized. It is quite plausible that both normative and informational influence may operate on a relational, non-verbal plane once an individual has recognized the views of the other group members: regardless of the group's comments, alignment of one's beliefs with those of the majority can occur due to a desire not to stand out, the desire to have correct views, or a combination of the former two motivations. Furthermore, besides their perplexing choice to only use female participants, Kaplan and Miller only assessed subjective reactions to the deliberation process after it was complete, so the trajectory of private feelings and views in their study is potentially reconstructive and subject to effects similar to hindsight bias (Roese & Vohs, 2012).

With the work of Kaplan and Miller (1987) and others in mind, the most apparent remaining task for research on the topic of decision rule as it relates to variants of conformity in group decision making is to accommodate a majority decision rule into the experimental paradigm established by this present dissertation research. Crossing decision rule (unanimity versus majority) with polling style (public versus private) in a factorial experimental design

ought to provide strong evidence for the relative influence of each conformity variant while suggesting the extent of conformity pressure applied by each decision criterion. Tracking participants' private views on the convincingness of the evidence and other judgmental aspects of the case throughout the duration of the polling and deliberation process should help deduce their feelings and thought trajectories. This experiment is currently underway in the same laboratory as the present dissertation study with the aim of combining the two into a 2 (majority versus minority faction) × 2 (public versus private deliberation) × 2 (unanimity versus majority rule) design that offers convenient comparisons of different common practices in jury protocol.

CONCLUSION

The present research is perhaps best described as a methodologically rigorous laboratory examination of conformity in small group decisions and a warning about the shortcomings of anonymity as a safeguard for social pressure in contexts like juries. It demonstrated robust conformity effects in the presence of majority factions favoring the opposing verdict regardless of whether voting and deliberation discussion were conducted publicly or anonymously and in spite of the presence of a fellow minority faction member. The finding that belief change mediated only a small percentage of vote switching in response to group pressure even in anonymous deliberation conditions coupled with the finding that the mediation effect may be stronger for some public deliberations raises questions about the constructs of normative and informational influence as separate forces and suggests that they are instead linked in a cyclical feedback process. Though the goal was to disentangle the two types of conformity to gain clarity into central motives in group decision making, this research is valuable in its suggestion that they are instead quite possibly enmeshed even more than was previously understood.

References

Abramson, J. B. (1994). *We, the jury: The jury system and the ideal of democracy: with a new preface*. Harvard University Press, 179–205.

Ambady, N., Bernieri, F. J., & Richeson, J. A. (2000). Toward a histology of social behavior: Judgmental accuracy from thin slices of the behavioral stream.

Asch, S. E. (1951). Effects of group pressure upon the modification and distortion of judgments. In: Guetzkow, Harold (1951). *Groups, leadership and men; research in human relations*. Oxford, England: Carnegie Press, 177-190.

Asch, S. E. (1952b). *Social psychology*. Englewood Cliffs, NJ: Prentice- Hall.

Asch, S.E. (1955). Opinions and social pressure. *Scientific American*, *193*, 35–35.

Asch, S. E. (1956). Studies of independence and conformity. A minority of one against a unanimous majority. *Psychological Monographs, 70*(9), 1-70.

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.

Baumeister, R. F., & Leary, M. R., (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motive. *Psychological Bulletin*, *117*(3), 497-529.

Baron, R. S., Dion, K. L., Baron, P. H., & Miller, N. (1971). Group consensus and cultural values as determinants of risk taking. *Journal of Personality and Social Psychology*, *20*(3), 446-455.

Baron, R. S., Monson, T. C., & Baron, P. H. (1973). Conformity pressure as a determinant of risk taking: Replication and extension. *Journal of Personality and Social Psychology*, *28*(3), 406-413.

Baron, R. S., Vandello, J. A., & Brunsman, B. (1996). The forgotten variable in

conformity research: Impact of task importance on social influence. *Journal of Personality and Social Psychology*, *71*(5), 915-927. doi**:** 10.1037/0022-3514.71.5.915

Bishop, G. D., & Myers, D. G. (1974). Informational influence in group discussion. *Organizational Behavior and Human Performance, 12,* 92-104.

Bond, R., & Smith, P. B. (1996). Culture and conformity: A meta-analysis of studies using Asch's (1952b, 1956) line judgment task. *Psychological Bulletin*, *119*(1), 111-137. doi: 0033-2909/96/S3.00

Bowser, A. S. (2013). To conform or not to conform: An examination of the effects of mock jury deliberation on individual jurors. *Electronic Theses and Dissertations*. Paper 1164. http://dc.etsu.edu/etd/1164

Davis, J. H., Brandstätter, H., & Stocker-Kreichgauer, G. (Eds.). (1982). *Group decision making* (pp. 27-58). European Association of Experimental Social Psychology by Academic Press.

Bray, R. M., & Kerr, N. L. (1979). Use of the simulation method in the study of jury behavior: Some methodological considerations. *Law and Human Behavior, 3*(1-2)*,* 107-113.

Burnstein, E., & Vinokur, A. (1973). Testing two classes of theories about group induced shifts in individual choice. *Journal of Experimental Social Psychology*, *9*(2), 123-137.

Burnstein, E., & Vinokur, A. (1977). Persuasive argumentation and social comparison as determinants of attitude polarization. *Journal of Experimental Social Psychology*, *13*(4), 315-332.

Campbell, J. D., Tesser, A., & Fairey, P. J. (1986). Conformity and attention to the

stimulus: Some temporal and contextual dynamics. *Journal of Personality and Social Psychology*, *51*(2), 315-324.

Cartwright, D. (1971). Risk taking by individuals and groups: An assessment of research employing choice dilemmas. *Journal of Personality and Social Psychology*, *20*(3), 361-378.

Cialdini, R. B., & Goldstein, N. J. (2004). Social influence: Compliance and conformity. *Annual Review of Psychology*, 55, 591–621.

Cialdini, R. B., & Trost, M. R. (1998). Social influence: Social norms, conformity, and compliance. In *The handbook of social psychology*. 4th ed. Vol. 2. Edited by Gilbert, D. T., Fiske, S. T., and Lindzey, G. 151–192. New York: McGraw-Hill.

Cialdini, R. B., Reno, R. R., & Kallgren, C. A. (1990). A focus theory of normative conduct: recycling the concept of norms to reduce littering in public places. *Journal of Personality and Social Psychology*, *58*, 1015-1026.

Cohen, G. L. (2003). Party over policy: The dominating impact of group influence on political beliefs. *Journal of Personality and Social Psychology*, *85*, 808–822. DOI: 10.1037/0022-3514.85.5.808

Cohen, J. (1992). A power primer. *Psychological bulletin*, *112*(1), 155-159.

Coleman, J. F., Blake, R. R., & Mouton, J. S. (1958). Task difficulty and conformity pressures. *The Journal of Abnormal and Social Psychology*, *57*, 120-122.

Cowan, C. L., Thompson, W. C., & Ellsworth, P. C. (1984). The effects of death qualification on jurors' predisposition to convict and on the quality of deliberation. *Law and Human Behavior*, *8*(1), 53-79.

Cooper, M. R., & Wood, M. T. (1974). Effects of member participation and commitment

in group decision making on influence, satisfaction, and decision riskiness. *Journal of Applied Psychology*, *59(2)*, 127-134.

Crutchfield, R. S. (1955). Conformity and character. *American Psychologist*, *10*, 191-198. doi: 10.1037/h0040237

Davis, J. H. (1973). Group decision and social interaction: A theory of social decision schemes. *Psychological Review*, *80*(2), 97-125.

Davis, J. H., Hulbert, L., Au, W. T., Chen, X. P., & Zarnoth, P. (1997). Effects of group size and procedural influence on consensual judgments of quantity: The examples of damage awards and mock civil juries. *Journal of Personality and Social Psychology*, *73*(4), 703-718.

Davis, J. H., Kerr, N. L., Atkin, R. S., Holt, R., & Meek, D. (1975). The decision processes of 6-and 12-person mock juries assigned unanimous and two-thirds majority rules. *Journal of Personality and Social Psychology*, *32*(1), 1-14.

Davis, J. H., Kerr, N. L., Stasser, G., Meek, D., & Holt, R. (1977). Victim consequences, sentence severity, and decision processes in mock juries. *Organizational Behavior and Human Performance*, *18*(2), 346-365.

Davis, J. H., Laughlin, P. R., & Komorita, S. S. (1976). The social psychology of small groups: Cooperative and mixed-motive interaction. *Annual review of Psychology*, *27*(1), 501-541.

Davis, J. H., Stasser, G., Spitzer, C. E., & Holt, R. W. (1976). Changes in group members' decision preferences during discussion: An illustration with mock juries. *Journal of Personality and Social Psychology*, *34*(6), 1177.

Davis, J. H., Stasson, M. F., Ono, K., & Zimmerman, S. (1988). Effects of straw polls on

group decision making: Sequential voting pattern, timing, and local majorities. *Journal of Personality and Social Psychology*, *55*(6), 918-926.

De Dreu, C. K., Nijstad, B. A., Baas, M., & Bechtoldt, M. N. (2008). The creating force of minority dissent: A motivated information processing perspective. *Social Influence*, *3*(4), 267-285.

Dennis, A. R. (1996). Information exchange and use in group decision making: You can lead a group to information, but you can't make it think. *Management Information Systems Quarterly*, *20*, 433-457.

Dennis, A. R., Hilmer, K. M., Taylor, N. J., Polito, A. (1997). Information exchange and use in GSS and verbal group decision making: Effects of minority influence. *Institute of Electrical and Electronics Engineers*, *97*, 84-93.

Deutsch, M., & Gérard, H. B. (1955). A study of normative and informational social influences upon individual judgment. *The Journal of Abnormal and Social Psychology*, *51*, 629-636. doi: 10.1037/h0046408

Devine, D. J. (2012). *Jury decision making: The state of the science*. NYU Press.

Devine, D. J., Clayton, L. D., Dunford, B. B., Seying, R., & Pryce, J. (2001). Jury decision making: 45 years of empirical research on deliberating groups. *Psychology, Public Policy, and Law*, *10*, 622-693.

Devine, D. J., Buddenbaum, J., Houp, S., Stolle, D. P., & Studebaker, N. (2007). Deliberation quality: A preliminary examination in criminal juries. *Journal of Empirical Legal Studies*, *4*(2), 273-303.

Devine, D. J., Olafson, K. M., Jarvis, L. L., Bott, J. P., Clayton, L. D., & Wolfe, J. M. (2004). Explaining jury verdicts: Is leniency bias for real? *Journal of Applied Social Psychology*, *34*(10), 2069-2098.

Diamond, S. S., Rose, M. R., & Murphy, B. (2005). Revisiting the unanimity requirement: the behavior of the non-unanimous civil jury. Northwestern University Law Review, *100*, 1-30.

Dittes, J. E., & Kelley, H. H. (1956). Effects of different conditions of acceptance upon conformity to group norms. *The Journal of Abnormal and Social Psychology*, *53*, 100-107.

Doise, W. (1969). Intergroup relations and polarization of individual and collective judgments. *Journal of Personality and Social Psychology*, *12*(2), 136-143.

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*(2), 119-146.

Ebbenson, 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,* 316-327.

Ekman, P., & Rosenberg, E. L. (1997). *What the face reveals: Basic and applied studies of spontaneous expression using the Facial Action Coding System (FACS)*. Oxford University Press, USA.

El-Shinnawy, M., & Vinze, A. S. (1998). Polarization and persuasive argumentation: A study of decision making in group settings. *Management Information Systems Quarterly*, 165-198.

Esser, J. K. (1998). Alive and well after 25 years: A review of groupthink research. *Organizational behavior and human decision processes*, *73*(2), 116-141.

Feddersen, Timothy J., and Wolfgang Pesendorfer. 1998. Convicting the innocent: The

inferiority of unanimous jury verdicts. *American Political Science Review*, *92*, 23-35.

Feinman, S. (1992). Social referencing and conformity. In *Social referencing and the social construction of reality in infancy* (pp. 229-267). Springer US.

Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, *7*, 117–140.

Festinger, L. (1962). *A theory of cognitive dissonance* (Vol. 2). Stanford University Press.

Festinger, L., & Carlsmith, J. M. (1959). Cognitive consequences of forced compliance. *Journal of Abnormal and Social Psychology*, *58*, 203–210.

Fitzpatrick, A. R. (1989). Social influences in standard setting: The effects of social interaction on group judgments. *Review of Educational Research*, *59*(3), 315-328.

Forsyth, D. R. (2013). Group dynamics. New York: Wadsworth. ISBN 978-1-13-395653-2. [Chapter 7]

Funder, D. C. (1982). On assessing social psychological theories through the study of individual differences: Template matching and forced compliance. *Journal of Personality and Social Psychology*, *43*(1), 100-110.

Garland, R. (1991). The mid-point on a rating scale: Is it desirable? *Marketing Bulletin*, *2*(1), 66-70.

Greenwald, A. G. (1968). Cognitive learning, cognitive response to persuasion, and attitude change. *Psychological Foundations of Attitudes*, 147-170.

Grofman, B. (2013). Mathematical models of juror and jury decision-making. In Sales, B. D. (Ed.). (2013). *The trial process* (Vol. 2). Springer Science & Business Media.

Hannaford-Agor, P. L., Hans, V. P., Mott, N. L., & Munsterman, G. T. (2002). *Are hung juries a problem?* Williamsburg, VA: National Center for State Courts.

Hans, V. P. (1978). *The effects of the unanimity requirement on group decision processes in simulated juries*. Unpublished doctoral dissertation, University of Toronto, Toronto, Canada.

Hartwick, J., Sheppard, B. H., & Davis, J. H. (1982). Group remembering: Research and implications. *Improving Group Decision Making in Organizations*, 41-72.

Hastie, R., Penrod, S., & Pennington, N. (1983). Inside the jury. The Lawbook Exchange, Ltd.

Hastie, R., Schkade, D. A., & Payne, J. W. (1998). A study of juror and jury judgments in civil cases: Deciding liability for punitive damages. *Law and Human Behavior*, *22*, 287-314.

Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford Press.

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences*, *33*(2-3), 61-83.

Hill, G. W. (1982). Group versus individual performance: Are N+ 1 heads better than one? *Psychological Bulletin*, *91*(3), 517.

Hiltz, S. R., Turoff, M., & Johnson, K. (1989). Experiments in group decision making, 3: Disinhibition, deindividuation, and group process in pen name and real name computer conferences. *Decision Support Systems*, *5*(2), 217-232.

Holstein, J. A. (1985). Jurors' interpretations and jury decision making. *Law and Human Behavior*, *9*, 83-100. doi: 10.1007/BF01044291

Holyoak, K. J., & Simon, D. (1999). Bidirectional reasoning in decision making by constraint satisfaction. *Journal of Experimental Psychology: General*, *128*(1), 3-31.

Huang, Y., Kendrick, K. M., & Yu, R. (2014). Conformity to the opinions of other people lasts for no more than 3 days. *Psychological science*, 0956797614532104.

Irwin, J. R., & Davis, J. H. (1995). Choice/matching preference reversals in groups: Consensus processes and justification-based reasoning. *Organizational Behavior and Human Decision Processes*, *64*(3), 325-339.

Isenberg, D. J. (1986). Group polarization: a critical review and meta-analysis. *Journal of Personality and Social Psychology*, *50*(6), 1141-1151.

Janis, I. L. (1971). Groupthink: The desperate drive for consensus at any cost. *Classics of Organization Theory*, *6*, 185-192.

Janis, I. L. (1972). Victims of groupthink: A psychological study of foreign-policy decisions and fiascoes. Oxford, England: Houghton Mifflin

Janis, I. L. (1997). *Groupthink*. University of Notre Dame Press.

Jones, C. S., & Kaplan, M. F. (2003). The effects of racially stereotypical crimes on juror decision-making and information-processing strategies. *Basic and Applied Social Psychology*, *25*(1), 1-13.

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica: Journal of the Econometric Society*, 263-291.

Kalven, H., Zeisel, H., Callahan, T., & Ennis, P. (1966). The American jury. Boston: Little, Brown.

Kameda, T. (1991). Procedural influence in small-group decision making: Deliberation style and assigned decision rule. *Journal of Personality and Social Psychology*, *61*(2), 245-256.

Kaplan, M. F. (1977). Discussion polarization effects in a modified jury decision

paradigm: Informational influences. *Sociometry*, 262-271.

Kaplan, M. F., & Kemmerick, G. D. (1974). Juror judgment as information integration: Combining evidential and nonevidential information. *Journal of Personality and Social psychology*, *30*(4), 493-499.

Kaplan, M. F., & Miller, C. E. (1987). Group decision making and normative versus informational influence: Effects of type of issue and assigned decision rule. *Journal of Personality and Social Psychology*, *53*(2), 306-313.

Kelley, H. H., & Thibaut, J. W. (1969). Group problem solving. *The Handbook of Social Psychology*, *4*, 1-101.

Kelley, H. H., & Volkart, E. H. (1952). The resistance to change of group-anchored attitudes. *American Sociological Review*, *17*(4), 453-465.

Kelman, H. C. (1958). Compliance, identification, and internalization: Three processes of attitude change. *Journal of Conflict Resolution*, 51-60.

Kessler, J. B. (1973). An empirical study of six- and twelve-member jury decision-making processes. *University of Michigan Journal of Law Reform*, *6*, 712-734.

Kerr, N. L., Atkin, R. S., Stasser, G., Meek, D., Holt, R. W., & Davis, J. H. (1976). Guilt beyond a reasonable doubt: Effects of concept definition and assigned decision rule on the judgments of mock jurors. *Journal of Personality and Social Psychology*, *34*(2), 282-294.

Kerr, N. L., Davis, J. H., Meek, D., & Rissman, A. K. (1975). Group position as a function of member attitudes: Choice shift effects from the perspective of social decision scheme theory. *Journal of Personality and Social Psychology*, *31*(3), 574-593.

Kerr, N. L., & Huang, J. Y. (1986). Jury verdicts: How much difference does one juror make? *Personality and Social Psychology Bulletin*, *12*(3), 325-343.

Kerr, N. L., & MacCoun, R. J. (1985). The effects of jury size and polling method on the process and product of jury deliberation. *Journal of Personality and Social Psychology*, *48*(2), 349-363.

Kerr, N. L., & MacCoun, R. J. (2012). Is the leniency asymmetry really dead? Misinterpreting asymmetry effects in criminal jury deliberation. *Group Processes & Intergroup Relations*, *15*(5), 585-602.

Kerr, N. L., MacCoun, R. J., & Kramer, G. P. (1996). Bias in judgment: comparing individuals and groups. *Psychological review*, *103*(4), 687-719.

Kerr, N. L., Niedermeier, K. E., & Kaplan, M. F. (1999). Bias in jurors vs bias in juries: New evidence from the SDS perspective. *Organizational Behavior and Human Decision Processes*, *80*(1), 70-86.

Kerr, N. L., Stasser, G., & Davis, J. H. (1979). Model testing, model fitting, and social decision schemes. *Organizational Behavior and Human Performance*, *23*(3), 399-410.

Kerr, N. L., & Tindale, R. S. (2004). Group performance and decision making. *Annu. Rev. Psychol.*, *55*, 623-655.

Kerr, N. L., & Tindale, R. S. (2012). Scientific inquiry on how groups decide: The Davisonian approach. *Group Processes & Intergroup Relations*, *15*(5), 577-584.

Kiesler, C. A. (1971). *The psychology of commitment: Experiments linking behavior to belief* New York: Academic Press.

Koch, C. M., & Devine, D. J. (1999). Effects of reasonable doubt definition and inclusion of a lesser charge on jury verdicts. *Law and Human Behavior*, *23*(6), 653-674.

Kogan, N., & Wallach, M. A. (1966). Modification of a judgmental style through group interaction. *Journal of Personality and Social Psychology*, *4*(2), 165-174.

Lamm, H., & Myers, D. G. (1978). Group-induced polarization of attitudes and behavior. *Advances in Experimental Social Psychology*, *11*, 145-195.

Lamm, H. & Trommsdorff, G. (1973). Group versus individual performance on tasks requiring ideational proficiency (brainstorming): A review. *European Journal of Social Psychology*, *3*(4), 361-388.

Laughlin, P. R. (1980). Social combination processes of cooperative, problem-solving groups on verbal intellective tasks. In M. Fishbein (Ed.), Progress in social psychology (Vol. 1, pp. 127–155). Hillsdale, NJ: Erlbaum.

Levine, J. M., & Moreland, R. L. (1994). Group socialization: Theory and research. *European Review of Social Psychology*, *5*, 305-336.

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.

MacCoun, R. J. (1989). Experimental research on jury decision-making. *Jurimetrics*, *30*, 223-233.

MacCoun, R. J. (2002). Comparing micro and macro rationality. *Judgments, Decisions, and Public Policy*, *116*, 127-28.

MacCoun, R. J. (2012). The burden of social proof: Shared thresholds and social influence. *Psychological review*, *119*(2), 345-372.

MacCoun, R. J., & Kerr, N. L. (1988). Asymmetric influence in mock jury deliberation: jurors' bias for leniency. *Journal of Personality and Social Psychology*, *54*, 21-33.

Mason, W. & Suri, S. (2011). Conducting behavioral research on Amazon's Mechanical Turk. *Behavior Research Methods*, *44*, 1-23. DOI: 10.3758/s13428-011-0124-6

McCauley, C. (1998). Group dynamics in Janis's theory of groupthink: Backward and forward. *Organizational Behavior and Human Decision Processes*, 73, 142-162.

McGuire, T. W., Kiesler, S., & Siegel, J. (1987). Group and computer-mediated discussion effects in risk decision making. *Journal of Personality and Social Psychology*, *52*(5), 917-930.

Mennecke, B. E. (1995). *An experimental examination of group information sharing, group size, and meeting structures for groups using a group support system*. AMCIS 1995 Proceedings. Paper 29. http://aisel.aisnet.org/amcis1995/29

Mesmer-Magnus, J. R., & DeChurch, L. A. (2009). Information sharing and team performance: a meta-analysis. *Journal of Applied Psychology*, *94*(2), 535-546.

Miller, N., & Baron, R. S. (1971, April). *On Measuring Counterarguing*. Paper presented at Eastern Psychological Association convention, New York, New York.

Milgram, S., Bickman, L., & Berkowitz, L. (1969). Note on the drawing power of crowds of different size. *Journal of Personality and Social Psychology*, *13*, 79-82.

Mohammed, S., & Ringseis, E. (2001). Cognitive diversity and consensus in group decision making: The role of inputs, processes, and outcomes. *Organizational Behavior and Human Decision Processes*, *85*(2), 310-335.

Moscovici, S., Doise, W., & Dulong, R. (1972). Studies in group decision II: Differences of positions, differences of opinion and group polarization. *European Journal of Social Psychology*, *2*(4), 385-399.

Moscovici, S., & Zavalloni, M. (1969). The group as a polarizer of attitudes. *Journal of*

Personality and Social Psychology, *12*(2), 125-135.

Munro, G. D., & Ditto, P. H. (1997). Biased assimilation, attitude polarization, and affect in reactions to stereotype-relevant scientific information. *Personality and Social Psychology Bulletin*, *23*(6), 636-653.

Myers, D. G. (1978). Polarizing effects of social comparison. *Journal of Experimental Social Psychology*, *14*(6), 554-563.

Myers, R. A. (1989). Testing persuasive argument theory's predictor model: Alternative interactional accounts of group argument and influence. *Communications Monographs*, *56*(2), 112-132.

Myers, D. G., Bach, P. J., & Schreiber, F. B. (1974). Normative and informational effects of group interaction. *Sociometry*, 275-286.

Myers, D. G., & Bishop, G. D. (1971). Enhancement of dominant attitudes in group discussion. *Journal of Personality and Social Psychology*, *20*(3), 386.

Myers, D. G., Bruggink, J. B., Kersting, R. C., & Schlosser, B. A. (1980). Does learning others' opinions change one's opinions? *Personality and Social Psychology Bulletin*, *6*(2), 253-260.

Myers, D. G., & Kaplan, M. F. (1976). Group-induced polarization in simulated juries. *Personality and Social Psychology Bulletin*, *2*(1), 63-66.

Myers, D. G., & Lamm, H. (1975). The polarizing effect of group discussion: The discovery that discussion tends to enhance the average prediscussion tendency has stimulated new insights about the nature of group influence. *American Scientist*, *63*(3), 297-303.

Myers, D.G. and Lamm, H. (1976). The group polarization phenomenon.

Psychological Bulletin, *83*, 602-627.

Nemeth, C. (1977). Interactions between jurors as a function of majority vs. unanimity decision rules. *Journal of Applied Social Psychology*, *7*(1), 38-56.

Nemeth, C. J. (1986). Differential contributions of majority and minority influence. Psychological Review, 93, 23-32. doi: 10.1037/0033-295X.93.1.23

Nisbett, R. E., & Wilson, T. D. (1977). Telling more than we can know: Verbal reports on mental processes. Psychological review, *84*(3), 231-259.

Nunamaker, J. F., Dennis, A. R., Valacich, J. S., Vogel, D., & George, J. F. (1991). Electronic meeting systems. Communications of the ACM, 34, 40-61.

Oppenheimer, D. M., Meyvis, T., & Davidenko, N. (2009). Instructional manipulation checks: Detecting satisficing to increase statistical power. *Journal of Experimental Social Psychology*, *45*(4), 867-872.

Paolacci, G., Chandler, J., & Ipeirotis, P.G. (2010). Running experiments on Amazon Mechanical Turk . *Judgment and Decision Making*, 5, 411-419. Retrieved from http://hdl.handle.net/1765/31983

Perez, D. A., Hosch, H. M., Ponder, B., & Trejo, G. C. (1993). Ethnicity of Defendants and Jurors as Influences on Jury Decisions. *Journal of Applied Social Psychology*, *23*(15), 1249-1262.

Petty, R. E., & Cacioppo, J. T. (1986). The elaboration likelihood model of persuasion. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 19, pp. 123–205). Orlando, FL: Academic Press.

Pinto, I. R., Marques, J. M., Levine, J. M., Abrams, D. (2010). Membership status and

subjective group dynamics: Who triggers the black sheep effect? *Journal of Personality and Social Psychology*, *99*, 107–119.

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, *40*(3), 879-891.

Pruitt, D. G. (1971). Choice shifts in group discussion: An introductory review. *Journal of personality and social psychology*, *20*(3), 339-360.

Read, S. J., Snow, C. J., & Simon, D. (2003). Constraint satisfaction processes in social reasoning. In *Annual Meeting of the Cognitive Science Society,* Boston.

Roese, N. J., & Vohs, K. D. (2012). Hindsight bias. *Perspectives on Psychological Science*, 7, 411-426. doi: 10.1177/1745691612454303

Ross, L., Bierbrauer, G., & Hoffman, S. (1976). The role of attribution processes in conformity and dissent: Revisiting the Asch situation. *American Psychologist*, *31*, 148-157. doi: 10.1037/0003-066X.31.2.148

Ross, L., & Nisbett, R. E. (1991). *The person and the situation: Perspectives of social psychology*. Mcgraw-Hill Book Company.

Rozelle, R. M., & Baxter, J. C. (1981). Influence of role pressures on the perceiver: Judgments of videotaped interviews varying judge accountability and responsibility. *Journal of Applied psychology*, *66*(4), 437-441.

Rugs, D., & Kaplan, M. F. (1993). Effectiveness of informational and normative influences in group decision making depends on the group interactive goal. *British Journal of Social Psychology*, *32*(2), 147-158.

Saks, M. J. (1977). Jury verdicts: The role of group size and social decision

rule. Lexington, MA: Lexington Books.

Salerno, J. M. (2012). *One Angry Woman: Emotion Expression and Minority Influence in a Jury Deliberation Context* (Doctoral dissertation, University of Illinois at Chicago).

Salerno, J. M., & Diamond, S. S. (2010). The promise of a cognitive perspective on jury deliberation. *Psychonomic Bulletin & Review*, *17*(2), 174-179.

Salerno, J. M., & Peter-Hagene, L. C. (2015). One angry woman: Anger expression increases influence for men, but decreases influence for women, during group deliberation. *Law and Human Behavior*, *39*(6), 581-592.

Sanders, G. S., & Baron, R. S. (1977). Is social comparison irrelevant for producing choice shifts? *Journal of Experimental Social Psychology*, *13*(4), 303-314.

Sandys, M., & Dillehay, R. C. (1995). First-ballot votes, predeliberation dispositions, and final verdicts in jury trials. *Law and Human Behavior*, *19*(2), 175-195.

Schittekatte, M. (1996). Facilitating information exchange in small decision-making groups. *European Journal of Social Psychology*, *26*(4), 537-556.

Scholten, L., Van Knippenberg, D., Nijstad, B. A., & De Dreu, C. K. (2007). Motivated information processing and group decision-making: Effects of process accountability on information processing and decision quality. *Journal of Experimental Social Psychology*, *43*(4), 539-552.

Shaw, M. (1981). Group dynamics: The psychology of small group behavior (3rd Ed.), McGraw-Hill, New York.

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.

Simon, D. (2004). A third view of the black box: Cognitive coherence in legal decision making. *The University of Chicago Law Review*, 511-586.

Simon, D., Pham, L. B., Le, Q. A., & Holyoak, K. J. (2001). The emergence of coherence over the course of decision making. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 27*(5)*,* 1250-1260.

Simon, D., Snow, C. J., & Read, S. J. (2004). The redux of cognitive consistency theories: evidence judgments by constraint satisfaction. *Journal of personality and social psychology, 86*(6), 814-837.

Smith, J. R., Terry, D. J., & Hogg, M. A. (2007). Social identity and the attitude–behaviour relationship: Effects of anonymity and accountability. *European Journal of Social Psychology*, *37*(2), 239-257.

Stasser, G., & Davis, J. H. (1981). Group decision making and social influence: A social interaction sequence model. *Psychological Review*, 88(6), 523-551.

Stasser, G and Kerr, Norbert L. and Davis, G.H. (1989) *Influence processes and consensus models in decision-making groups.* In: Paulhus, P (Ed.) Psychology of group influence. L. Erlbaum, Hillsdale, NJ.

Stasser, G., Stella, N., Hanna, C., & Colella, A. (1984). The majority effect in jury deliberations: Number of supporters versus number of supporting arguments. *Law & Psychology Review*, *8*, 115-127.

Stasser, G., Taylor, L. A., & Hanna, C. (1989). Information sampling in structured and unstructured discussions of three-and six-person groups.*Journal of Personality and Social Psychology*, *57*(1), 67-78.

Stasser, G., & Titus, W. (1985). Pooling of unshared information in group decision

making: Biased information sampling during discussion. *Journal of Personality and Social Psychology*, *48*(6), 1467-1478.

Stasser, G., & Titus, W. (1987). Effects of information load and percentage of shared information on the dissemination of unshared information during group discussion. *Journal of personality and social psychology*, *53*(1), 81-93.

Stasser, G. (1992). Pooling of unshared information during group discussion.*Group \ process and productivity*, 48-67.

Stewart, D. D., & Stasser, G. (1998). The sampling of critical, unshared information in decision-making groups: the role of an informed minority. *European Journal of Social Psychology*, *28*(1), 95-113.

Stoner, J. A. F. (1961). *A comparison of individual and group decisions involving risk* (Doctoral dissertation, Massachusetts Institute of Technology).

Schulz-Hardt, S., Brodbeck, F. C., Mojzisch, A., Kerschreiter, R., & Frey, D. (2006). Group decision making in hidden profile situations: dissent as a facilitator for decision quality. *Journal of Personality and Social Psychology*, *91*, 1080-1093.

Taylor-Thompson, K. (2000). Empty Votes in Jury Deliberations. *Harvard Law Review*, *113*(6), 1261-1320.

Tanford, S., & Penrod, S. (1986). Jury deliberations: Discussion content and influence processes in jury decision making. *Journal of Applied Social Psychology*, *16*(4), 322-347.

Tetlock, P. E. (1983a). Accountability and complexity of thought. *Journal of Personality and Social Psychology*, *45*(1), 74.

Tetlock, P. E. (1985). Accountability: The neglected social context of judgment and choice. *Research in Organizational Behavior*, *7*(1), 297-332.

Tindale, R. S., Smith, C. M., Dykema-Engblade, A., & Kluwe, K. (2012). Good and bad group performance: Same process – different outcomes. *Group Processes and Intergroup Behavior*, *15*(5), 603-618. doi: 10.1177/1368430212454928

Triplett, N. (1898). The dynamogenic factors in pacemaking and competition. *American Journal of Psychology*, 9, 507-533.

Valacich, J. S., Sarker, S., Pratt, J., & Groomer, M. (2002, January). Computer-mediated and face-to-face groups: who makes riskier decisions?. In *System Sciences, 2002. HICSS. Proceedings of the 35th Annual Hawaii International Conference on* (pp. 133-142). IEEE.

Vinokur, A., & Burnstein, E. (1974). The effects of partially shared persuasive arguments on group induced shifts: A group problem solving approach. *Journal of Personality and Social Psychology, 29,* 305-315.

Whyte, G. (1989). Groupthink reconsidered. *Academy of Management Review*, *14*(1), 40-56.

Winquist, J. R., & Larson Jr., J. R. (1998). Information pooling: When it impacts group decision making. *Journal of Personality and Social Psychology*, *74*, 371-377.

Wittlin, M. (2015). The Results of Deliberation. *Available at SSRN 1865031*.

Zimbardo, P. G. (1969). The human choice: Individuation, reason, and order versus deindividuation, impulse, and chaos. In *Nebraska symposium on motivation*. University of Nebraska Press.

Zuber, J. A., Crott, H. W., & Werner, J. (1992). Choice shift and group polarization: An analysis of the status of arguments and social decision schemes. *Journal of Personality and Social Psychology*, *62*(1), 50-61.

APPENDIX A

Sample Online Interface for Pilot Studies 1 and 2

APPENDIX B

Briefing/Debriefing Script with Suspicion Questions

(*Casually, ad lib.:*) "Before we start, let me just make sure that all you guys are here for the right experiment."
(*Ask each participant for their initials, mark the time sheet, and assign each person to the correct seat – participant always gets seat #1*)

(*Public condition, once everyone is seated:)*" Please turn off all cellphones for the duration of the study – we don't want any distractions. *(Wait until everyone shuts them off and have confederates pretend to do so.)*

So, welcome to the Juror Reasoning and Decision Making study. In this study, we're interested in looking at how people respond to different kinds of cases and evidence. In a moment, I will have you all take on the role of mock jurors. You will read a case, deliberate, vote, and answer some questions about your thoughts throughout the process.

You'll see that you each have a packet in front of you. **We've got some pages in the packet with red signs that say "Stop"– please follow those directions and do not skip ahead. You are not allowed to turn back to previous pages unless I tell you to do so.** We all need to be on the same page here – putting your pens down will let me know that everyone has finished a given section. Because we have a limited amount of time, there will be some time constraints on certain sections. Just a quick ground rule, as well: You can say whatever you want to the group, but you can't single out anyone for interrogation. Let's keep things polite as we arrive at a **unanimous decision**."

1. "All right, we're ready to begin. Please fill out the questions until you reach Stop #1." ~3 min.
2. "OK, everyone, please continue reading in the packet until you reach Stop #2." ~5-7 min.
3. "Now please continue answering questions quietly until you reach Stop #3." (Note: detach materials between Stop #2 and Stop #3 so that participants don't see their previous responses – collect before vote)
4. "Now we will vote." *Public Condition:* "I will ask you one by one. Just say Guilty or Not Guilty."
   Private Condition: "Please hand the pages with your votes to me face-down."

   "So that's [X] votes for Guilty and [Y] votes for Not Guilty. Now we'll hear some comments that you've all written for the group to consider.
   Public Condition: "Juror #1, please share your comments with the group."
   Private Condition: "I'm going to shuffle these up and read them out. The first one says…"

After initial comments: "You all can now take some time to discuss all the facts and different sides of the case." *Allow discussion to proceed for a maximum of 30 minutes.* **Record this duration or that of a natural ending point.**

5. Now you may take a few minutes to re-read the case facts. Please go back to Stop #1 of your packet and read until Stop #2. Look to me for further directions at that point."

6. "Now we will take a final vote to determine the verdict."
   Public Condition: "I will ask you one by one. Just say Guilty or Not Guilty." *Note: Reverse voting sequence to show ally confederate switching.*
   "Now please go past Stop #3 and write down what you just voted for on the page with Stop #4."

   Private Condition: "Please go past Stop #3 and write down your vote on the page with Stop #4.
   "Please hand the pages with your votes to me face-down." Read off votes: ""So that's [X] votes for Guilty and [Y] votes for Not Guilty.

7. "Now please complete the remainder of the questions until Stop #5"
8.
9. *Suspicion questioning*: "Thank you all for your participation. I have a few questions for each of you that I'll ask you in private. Please wait quietly and patiently – we'll be out of here soon. Juror #1, please come with me into the other room…"
10. *Suspicion questioning*: "Thank you again for your participation. I have a few questions for you:
    a. *If the participant switched their vote:* "I noticed that you switched your vote. Why did you do that?"
    b. "What do think this study was about?"
    c. "Do you think there were any other purposes to the study?"
    d. "Do you feel like there was anything strange, uncomfortable, or suspicious that happened during the experiment?"

    That's it – we're all set. I'll go ahead and give you Sona credit. Thanks again. Have a great day!

APPENDIX C

Case Packet for Mock Jurors

University of California, Irvine
Study Information Sheet
Juror Reasoning and Decision Making

Lead Researcher
Robert Garcia
Psychology and Social Behavior
310-733-6574 / garciar1@uci.edu
Faculty Sponsor
Nicholas Scurich, Ph.D.
Psychology & Social Behavior, and Criminology, Law & Society
949-824-4046 / nscurich@uci.edu

- You are being asked to participate in a research study examining how jurors reason and make decisions in a criminal case.

- You are eligible to participate in this study if you are at least 18 years old and reside within the United States. You may participate in this study only once.

- The research procedures involve reading a summary of a legal proceeding and providing your opinion about the guilt or innocence of the defendant. You will see how other people responded to the case and will have the opportunity to share your opinion about the case. The study should not take longer than 30 minutes to complete.

- Possible risks/discomforts associated with the study are virtually non-existent. The materials contain no more graphic detail than could be found in a newspaper article.

- There are no direct benefits from participation in the study. However, this study may have implications for legal policy and procedure, which could increase the fairness of the adjudicatory process.

- You will receive one point of extra credit on Sona Systems for your participation in this study. Should you consent to participate in this study, it is expected that you attend to the materials.

- All research data collected, even though it is anonymous, will be stored securely and confidentially on the researchers' office computers. This computer requires a password to access that only authorized study team members have.

- The research team and authorized UCI personnel may have access to your study

records to protect your safety and welfare. Any information derived from this research project that personally identifies you will not be voluntarily released or disclosed by these entities without your separate consent, except as specifically required by law.

- If you have any comments, concerns, or questions regarding the conduct of this research please contact the researchers listed at the top of this form.

- Please contact UCI's Office of Research by phone, (949) 824-6662, by e-mail at IRB@research.uci.edu or at 5171 California Avenue, Suite 150, Irvine, CA 92617 if you are unable to reach the researchers listed at the top of the form and have general questions; have concerns or complaints about the research; have questions about your rights as a research subject; or have general comments or suggestions.

Participation in this study is voluntary. There is no cost to you for participating. You may choose to skip a question or a study procedure. You may refuse to participate or discontinue your involvement at any time without penalty. You are free to withdraw from this study at any time. **If you decide to withdraw from this study you should notify the research team immediately.**

By turning the page and continuing in the packet, you acknowledge that you have read and understand your rights as a participant and the terms of compensation for your participation.

1. Please write your age (in years): _____

2. Please indicate with a check mark the gender with which you identify:
Male ___ Female ___ Other___

3. Which of the following ethnic categories best describes you? (You may check more than one response.)
Caucasian ___
African or African American ___
American Indian or Alaskan Native ___
East Asian ___
South Asian ___
Middle Eastern ___
Native Hawaiian or other Pacific Islander ___
Hispanic/Latino ___
Other___

4. Do you have prior experience serving on a real jury?
No ___ Yes, once ___ Yes, more than once ___

5. Which of the following best describes your political affiliation?
Democratic Party ___
Republican Party ___
Libertarian Party ___
Green Party ___
Independent/None of the above ___

6. Which of the following best describes your religious affiliation?
Agnostic ___
Atheist ___
Buddhist ___
Catholic ___
Christian ___
Hindu ___
Jewish ___
Muslim ___
Other ___

7. What is/are your major/s? Write here: _____

STOP HERE AND AWAIT FURTHER INSTRUCTIONS (1)

Case Synopsis and Juror Instructions

Superior Court of the State of CA v. Reginald Thompson

Reginald Thompson is charged with one count of sexual assault in the first degree.

In California, sexual assault is defined by statute as an act of sexual intercourse accomplished against a person's will by means of force, violence, duress, menace, or fear of immediate and unlawful bodily injury on the person or another.

Mr. Thompson has pleaded not guilty to the charge.

Your duty as a juror is to carefully read the evidence in the case before you. You should refrain from making any judgments about the defendant’s guilt or innocence until instructed to do so. You may not discuss the facts of this case amongst yourselves until instructed to do so.

The defendant has pleaded not guilty. By doing so, he denies the charge in the indictment. Thus, the Government has the burden of proving the charges against him beyond a reasonable doubt. A defendant does not have to prove his innocence. On the contrary, he is presumed to be innocent of the charges contained in the indictment.

These are the undisputed facts of the case:

On a Thursday night in 2013, a 17-year-old Caucasian girl, known as Tiffany S., was leaving Burger King in Santa Monica when a man drew a gun and forced her into a Chevrolet pickup truck. He drove her to a secluded area, put on a condom, and raped her inside the truck.

The ordeal lasted approximately 75 minutes. The man then drove her back to town and told her "If you tell anyone what happened, I'll find you and kill you." Tiffany immediately ran to the nearest business and called 911.

Tiffany was taken to Saint John's Health Center where a rape examination kit was administered, as is state protocol for victims of forcible intercourse. The examination involves the collection of seminal fluid and the administration of an HIV test. As the assailant had used a condom, no seminal fluid was found.

Tiffany was able to describe the truck in detail to detectives. She said it was a blue Chevrolet Silverado, with large chrome rims, and a decal along the bottom of the rear window.

Tiffany was also able to give a description of the assailant. She described the man as African-American, about 6'1" and in his late 20s or early 30s. She did remember the man having numerous tattoos on his arms and a large scar on his neck.

The prosecution offers the following evidence to prove the guilt of Mr. Thompson:

Detective Phillip DuBois from the Santa Monica Police Department testified that he received an anonymous tip to question Reginald Thompson, who worked as a clerk at a nearby store. Mr. Thompson was visibly nervous. Detective DuBois had Mr. Thompson taken to the police station for questioning.

A neighbor who used to live in the same apartment complex as Mr. Thompson also testified. He remembered seeing Reginald's brother driving a blue pickup truck with decals on at least one of the windows for a while.

The victim, Tiffany S., testified. When asked if she could identify the perpetrator of the crime, she pointed to the defendant, Reginald Thompson. She had first made this identification after looking through mug-shots while still in the hospital. She said, "I am completely, without a doubt, sure that the defendant is the one who raped me. I remember the scar on his neck!"

The defense offers the following evidence:
Mr. Thompson's brother testified that the defendant was at his home on the night in question. He stated that Mr. Thompson had been suffering from the flu, and stayed at his house for about a week. His brother, who is a mechanic raising a young child, said he rarely left the house during the entire week. He also noted that his house is in Torrance, which is over 20 miles from Santa Monica.

The defense called an expert on eyewitness identification to testify about the victim's identification of Mr. Thompson. The expert testified that it is known from laboratory studies and real world simulations that certain factors increase the likelihood of mistaken identification. Situations in which people are highly nervous or anxious, such as when being attacked, are very likely to yield unreliable identifications. Cross-racial identifications, such as when a Caucasian identifies a Black or Hispanic person, are less reliable than within-race identifications. He noted that both these factors were present in the current case.

You have now heard all of the evidence in the case. Before you retire to deliberate, here are some instructions on the process. First, some preliminary rules:

- You have a duty to consult with one another and to deliberate with a view to reaching a verdict. You all have an equal vote in determining the verdict.

- You each must decide the case for yourself, but only after an impartial consideration of the evidence with your fellow jurors.

- In the course of deliberations, you should not hesitate to reexamine your own views and change your opinion if convinced it is erroneous.

- You should not surrender your honest conviction as to the weight or effect of the evidence solely because of the opinion of your fellow jurors, or for the mere purpose of returning a verdict.

- You must be convinced of the defendant's guilt beyond a reasonable doubt if you are to convict him of the crimes for which he is accused, otherwise you must acquit him.

- **Finally, the jury must reach a unanimous verdict. This means that everyone must agree on the appropriate verdict, whether it is to convict or acquit.**

STOP HERE AND AWAIT FURTHER INSTRUCTIONS (2)

Please 1) **silently vote either Guilty or Not Guilty now:**

☐ GUILTY

☐ NOT GUILTY

2) answer the questions below quietly until you reach the part that says STOP
3 DO NOT turn back to previous sections.

The other jurors will NOT see these responses you will bubble in:

Please rate your confidence in your decision:

	Not at all confident		Slightly confident		Moderately confident		Mostly confident		Completely confident
	○	○	○	○	○	○	○	○	○

How strong would you rate the evidence against the defendant?

	Not at all convincing		Slightly convincing		Moderately convincing		Mostly convincing		Completely convincing
	○	○	○	○	○	○	○	○	○

How likely was Mr. Thompson at his brother's house the night of the assault?

	Not at all likely		Very unlikely		Moderately likely		Very likely		Completely likely
	○	○	○	○	○	○	○	○	○

Please write any comments or arguments you may have for the group to consider. Feel free to read from what you've written on this paper when it is your turn to speak. Please be sure to write clearly, as your response will be analyzed later.

STOP HERE AND AWAIT FURTHER INSTRUCTIONS (3)

THIS PAGE IS LEFT BLANK INTENTIONALLY.

1) **Silently vote either Guilty or Not Guilty for the final verdict.**

☐ **GUILTY**

☐ **NOT GUILTY**

2) Answer the questions below quietly until you reach the part that says STOP

The other jurors will NOT see these responses you will bubble in:

Please rate your confidence in your decision:

	Not at all confident		Slightly confident		Moderately confident		Mostly confident		Completely confident
	○	○	○	○	○	○	○	○	○

How strong would you rate the evidence against the defendant?

	Not at all convincing		Slightly convincing		Moderately convincing		Mostly convincing		Completely convincing
	○	○	○	○	○	○	○	○	○

How likely was Mr. Thompson at his brother's house the night of the assault?

	Not at all likely		Very unlikely		Moderately likely		Very likely		Completely likely
	○	○	○	○	○	○	○	○	○

STOP HERE AND AWAIT FURTHER INSTRUCTIONS (4)

Now that the votes are in and the verdict is decided, please answer the following questions:

Please rate your satisfaction with the group's decision.

	Not at all satisfied		Slightly satisfied		Moderately satisfied		Mostly satisfied		Completely satisfied
	○	○	○	○	○	○	○	○	○

To what extent were you affected by what others said?

	Not at all affected		Slightly affected		Moderately affected		Strongly affected		Extremely affected
	○	○	○	○	○	○	○	○	○

Please indicate your level of agreement with the following statement:

The other jurors said something I had not thought about.

	No agreement at all		Slight agreement		Moderate agreement		Mostly in agreement		Complete agreement
	○	○	○	○	○	○	○	○	○

Please indicate your level of agreement with the following statement:
I think the other jurors like me.

	No agreement at all		Slight agreement		Moderate agreement		Mostly in agreement		Complete agreement
	○	○	○	○	○	○	○	○	○

Please indicate your general level of comfort with public speaking:

	No comfort at all		Slight comfort		Moderate comfort		Mostly comfortable		Completely comfortable
	○	○	○	○	○	○	○	○	○

STOP HERE AND AWAIT FURTHER INSTRUCTIONS (5)

APPENDIX D

Sample Online Interface for Private Deliberation Conditions