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Social Cognitive Processes in the Priming of Mental Illness Stereotypes by the Media

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SOCIAL COGNITIVE PROCESSES IN THE PRIMING
OF MENTAL ILLNESS STEREOTYPES BY THE MEDIA

by

JUN YI GINNY CHAN

A dissertation submitted to the Graduate Faculty in Psychology in partial fulfillment of the requirements for the Degree of Doctor of Philosophy, The City University of New York

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Of Mental Illness Stereotypes by the Media

by

Jun Yi Ginny Chan

This manuscript has been read and accepted for the Graduate Faculty in Psychology in Clinical Psychology satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

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Abstract
SOCIAL COGNITIVE PROCESSES IN THE PRIMING OF MENTAL ILLNESS STEREOTYPES BY THE MEDIA
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In high-profile violent incidents, there appears to be a disproportionate focus on the perpetrator’s mental health status in relation to the incident (Angermeyer & Matschinger, 1996; Gallup Inc., 2011, 2013). Several studies have highlighted the biased nature of the media in reporting news on mental illness and its negative impact on general consensus (Corrigan et al., 2013; McGinty et al., 2013; Wahl, 1992, 2003; Wahl & Lefkowits, 1989). Researchers have also suggested that the media is a significant source of knowledge for the public (Jorm, 2000; Wahl, 2003). While existing social psychological explanations have contributed to understanding this phenomenon, there remain questions about the mechanism of the process. Based on a constructive model of communication, pragmatic inference posits that one does not remember information verbatim and may remember details that were not explicitly stated but plausibly implied (Brewer, 1977). From a social cognitive perspective, pragmatic inference and stereotype priming provide a framework to understand the reader’s comprehension as it captures the reality of information processing in real-time. The current studies thus aimed to examine the underlying processes in reading comprehension, the impact of stereotypical beliefs regarding mental illness, and the potential impact of mood. The interaction of mood and cognition has generally found support for greater reliance on stereotypes in positive relative to negative mood (Bodenhausen et al., 1994a; Park & Banaji, 2000). Results from both studies generally supported the main effect of mental illness prime, and evidence of pragmatic inference underlying the layperson’s processing
of news in the media. That is, lay people appear to remember gist of information, rather than accurate presented information, and this remembered material was also impacted by stereotypes that were activated by a priming stimulus (mention of mental illness). Additionally, results yielded large effect sizes across the main dependent memory measures. However, self-report attitudinal measures and information-processing styles were not significantly related to memory measures. Overall, the results suggest the significance of mentioning mental illness by the media and its repercussions in terms of propagating exaggerated stereotypes of mental illness among laypersons consuming the news. Thus, responsible and more prudent reporting is recommended in terms of the inclusion of only pertinent information in news articles on violent incidents. Additionally, results illuminate the social cognitive processes that underlie one’s reading and what salient factors are involved in remembering information and forming impressions.
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To old friends back home who always stayed in touch and mailed me packages of food and cards: Thank you! Your messages warmed my heart and gave me the strength to go on that one more hour. To new friends who welcomed me with warm hugs (and a drink): Gracias! You have made me feel so welcomed and loved. Thank you for keeping me sane through this and being beside me as we adventured. To more good times!
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Chapter 1: Overview of Media Representation of Mental Illness

Shortly after two widely covered mass shootings in the United States (the 2011 Tucson and 2013 Washington Naval Yard gun shooting, both involving multiple victims), Gallup Inc. (2011, 2013) polled opinion surveys on what the general public believed to be preventable causes of mass shootings. When asked about the main 'factors that are to be blamed' (Gallup Inc., 2011) for the 2011 shooting, 48% of the respondents attributed a great deal of blame to the inadequacy of the mental health system in 'identifying individuals who are a danger to others,' 46% agreed that gun control access played a role, and 42% accorded to the role drug use had. In 2013, the same questions found a similar rate of endorsement of the mental health system failure (48%), a slight decrease in both gun control access (40%), and drug use (37%). Thirty-two percent of respondents also agreed that the mental health system failure contributed a fair amount to mass shootings and comparatively, gun control access was endorsed by 21% of the respondents.

Results from this survey clearly highlighted that the large majority of the polled consensus (80%) had agreed that the mental health system's lack of identification of “dangerous individuals” was an important factor leading to mass shootings relative to 61% who agreed that access to gun was an important factor (Gallup Inc., 2013). As the survey was administered two days after the incidents, the results may be biased towards a more reactive picture of public attitudes. Nonetheless, the results provide a snapshot of public reactions to recent shootings both of which had incurred widespread media coverage. The polls also emphasized the attention that was placed on the mental health status of the perpetrator by the media and suggested that mental health issues were a significant concern and reported to be a causal factor of the ensuing violence (Gallup Inc., 2011, 2013).
A study by Angermeyer and Matschinger (1996) in Germany had similar findings. In 1991, there were two assassination attempts, about eight months apart, on well-known German politicians by two individuals who both had a history of schizophrenia. Both incidents reportedly led to extensive coverage in the media where there was a disproportionate focus on their mental health history. The authors collected reported attitudes towards mental illness at six time points: right before the first assassination attempt, two weeks after the first attempt, a month after the second attempt, and three more times over the next two years. They found evidence of an increased desire for social distance (i.e., reported less desire to have someone with mental illness as a neighbor, co-worker, tenant, and a partner your child marries etc.) following the incidents with a gradual decrement over the two years. However, reported desire for social distance remained significantly higher than before the first incident occurred (Angermeyer & Matschinger, 1996). The authors argued that the results were indicative of the negative impact “selective reporting” in the media has on public attitudes and beliefs. A thought-provoking result was also highlighted by the authors where they found that, 18 months after the second attack, 83.2% of respondents who remembered the incident also remembered that the perpetrator was a woman with mental illness and 48.7% recalled the involvement of mental illness in the second perpetrator for the second incident (Angermeyer & Matschinger, 1996).

The above two illustrations of media reporting about violent incidents involving people with mental illness are but a flavor of the general literature on the impact of media on attitudes toward mental illness. Jorm and his colleagues (1997) coined the term mental health literacy to refer to the general notion and understanding of mental illness that can be geared toward recognizing and managing mental illness. In a review on mental health literacy in Australia, they highlighted that the scientific field has not yet systematically examined where and how the lay
public was receiving their information on mental illness and suggested some possible sources: personal experiences, friends’ and family’s experiences, news reports, television, and films (Jorm, 2000). He cited a survey in the United Kingdom where 32% of respondents indicated media as their primary source of information (Wolff, Pathare, Craig, & Leff, 1996; as cited in Jorm, 2000) and also described several studies supporting the influence of media over public attitudes. Additionally, Jorm (2000) noted the disproportionately high frequency of violence and crime associated with mental illness that was present in the media.

Given the ubiquity of the media in many societies and its importance as an “official” source of information to the public (e.g., Jorm, 2000; Wahl, 1992, 2003), this negative bias of information likely has a role in shaping public opinions and beliefs about mental illness (e.g., Angermeyer & Matschinger, 1996; Wahl, 1992). To better understand how the current view of mental illness in the general public came to be, reviewing research on media and mental illness is an informative and essential step. Consequently, it is also important to consider the various processes that may underlie this transmission of information. That is, to explore the social and cognitive processes by which the public come to endorse these stereotypical beliefs.

This literature review will thus include the following topics of interest: mental health stigma, stereotypes and their activation (social aspect), factors impacting stereotype activation, media and its portrayal of mental illness, the impact of media on attitudes towards mental illness, and pragmatic inference (cognitive aspect). The review of mental health stigma highlights the common stereotypes that are associated with mental illness and discusses the general public attitudes towards mental illness. A discussion of the literature on the nature of stereotypes and its activation will follow and it aims to improve the understanding of how stereotypes are activated in an individual and the pervasiveness of stereotypes. Reasonably speaking, mental
illness stereotypes should largely function in a similar fashion to other classic areas of stereotypes that have been studied (e.g., race, gender, age) as it is based on the same underlying theories and processes. Understanding the mechanisms of stereotype activation is imperative when our goal is to examine how people endorse these stereotypes and how they are perpetuated. Subsequently, past research exploring how media portrays mental illness would be surveyed. Besides the descriptive analysis of media content and portrayal, social psychological approaches to understanding stigma perpetuated by the media would also be considered. Pragmatic inference, a cognitive mechanism in discourse processing, will then be reviewed and adopted along with stereotype activation as a social cognitive framework to better understand comprehension of news about individuals with mental illness that is presented by the media.
Chapter 2: Mental Health Stigma

Link and Phelan (2001) described stigma as occurring when “elements of labelling, stereotyping, separation, status loss, and discrimination occur together in a power situation” (p. 377). Using this conceptualization, stereotypes can be understood as one of the core components of stigma, and are usually construed as the cognitive component of the stigmatizing process (Biernat & Dovidio, 2003; Link & Phelan, 2001; Stier & Hinshaw, 2007). Biernat and Dovidio (2003) proposed a similar understanding of stigma and further discussed how stereotypes can contribute to stigmatization. They noted that the activation of stereotypes can spark a chain reaction of attributions that ultimately lead to social avoidance and discriminatory behavior. For the current discussion, both stigma and stereotype will be considered in a similar manner. That is, stigma refers to the overall experience stigmatized persons may face while stereotypes refer to the specific attributes linked to the label.

Since Goffman’s (1963) influential discussion of the construct of stigma, research on stigma has been expanded into the various forms of identity or visible physical characteristics, e.g., race (Devine & Elliot, 1995), gender (Lupetow, Garovich, & Lupetow, 1995), sexual orientation (Herek, 2000), HIV status (Parker & Aggleton, 2003), and individuals who are overweight (Crandall, 1994). A major area of focus in the study of stigma and stereotyping has also been on the stigma towards persons diagnosed with mental illness. Research in this area has argued for the significant detrimental effects of mental health stigma in terms of more negative social integration, employment, and beliefs towards the self (Link, Cullen, Struening, Shrout, & Dohrenwend, 1989), well-being over a course of a year even after successful treatment completion (Link, Struening, Rahav, Phelan, & Nuttbrock, 1997), and impact on treatment effectiveness and self-esteem (Yanos, Roe, Markus, & Lysaker, 2008). Besides research looking
at just mental illness, a recent comprehensive review highlighted and discussed the importance of considering the potential interactional effects of mental illness, race, and criminal history stigma (West, Yanos, & Mulay, 2014).

Although public awareness about mental illness appears to have grown, surveys of the US population suggest that public attitudes towards people with mental illness have not substantially changed since such attitudes were first tracked in the 1950s. In a 1996 United States nationwide survey looking at public conceptualizations of mental illness, the authors found that mental illness symptoms as presented in a vignette elevated the public's beliefs about perceived dangerousness of and an increased desire of social distance from persons with mental illnesses (Link, Phelan, Bresnahan, Stueve, & Pescosolido, 1999). The MacArthur Mental Health Study (as part of the General Social Survey) presented vignettes that painted a symptomatic picture of the following disorders: schizophrenia, major depressive disorder, alcohol dependence, cocaine dependence, and a “troubled” person with no formal mental disorder symptoms. There were a significantly greater number of people who endorsed higher likelihood of dangerousness from the vignettes of the mental disorders as compared to the vignette of the “troubled” person. With regards to an elevated desire for social distance, the authors argued that perceived dangerousness and the negative connotation of mental illness symptoms were the two main driving forces behind it. Additionally, the authors compared the results of the survey to a study conducted in 1950 (Star, 1955, as cited in Link et al., 1999) and indicated that the notion of dangerousness among persons with mental illness had increased in the nearly fifty year period. One other interesting result was that people had a greater tendency to classify the schizophrenia vignette as a mental illness and more likely to be dangerous when compared to the other disorders (Link et al., 1999).
An updated analysis compared the 1996 MacArthur Mental Health Study (as discussed above) with its 2006 replication counterpart and found no evidence for a decrease in the level of stigma against persons with mental illnesses 10 years later (Pescosolido et al., 2010). This trend occurred in spite of the apparent increased knowledge of the public regarding the neurobiological underpinnings of mental illnesses. In fact, the authors highlighted the disappointing finding that increased knowledge did not lead to a reduction in stigma. Hinshaw and Stier (2008) have suggested that the medical model of explaining mental illness may be too reductionistic in its conceptualization, leading the general public to ignore other important factors such as the person-environment interaction. Of particular concern here too, the vignette on schizophrenia was endorsed as being more likely to be dangerous to both self and others (Pescosolido et al., 2010).

A recent review summarizing the state of research in the United States on the public's stigma towards mental illness found the following variables to be related to stigmatizing attitudes and beliefs: socio-demographic attributes of the respondent (e.g. age, gender, education, religion, political orientation, health status, and population density), personal contact with persons with mental illness, and causal attributions of mental illness (Parcesepe & Cabassa, 2013). Of relevance here, the authors found that heightened ideas of dangerousness to self and others, relative to the general public and a 'normal' troubled person were common across the studies. Other stigmatizing beliefs include incompetence, higher rates of criminality, and generally more blame and punishment towards individuals with mental illness (Parcesepe & Cabassa, 2013). As noted earlier, one intriguing association noted in these population-based surveys was that causal attributions of the mental illness to biological bases (i.e., genetics or chemical imbalance) was found to increase the likelihood of perceiving someone as being dangerous (Parcesepe &
Cabassa, 2013; Pescosolido et al., 2010). Education about mental illness was one of the earlier proposed methods to reducing stigmatizing beliefs (Corrigan, Markowitz, & Watson, 2004) and it may seem counter-intuitive that this relationship was found. Perhaps the lay public's understanding of neurobiological explanations of mental illnesses is more perfunctory than accurately nuanced, and may lead them to assume and infer that psychiatric symptoms are not able to be controlled and thus, contribute to a sense of unpredictability and uncontrollability of the individual with mental illness.

Cross-culturally, Angermeyer and Dietrich (2006) found a similar pattern of beliefs and attitudes across 62 studies in various countries located in Europe, North America, Hong Kong, Australia, and New Zealand. Of interest here is the finding that the most common belief lay people have of persons with mental illness is that they are unpredictable. The conception of persons with mental illness as being dangerous was also typically endorsed, although to a lesser degree. As in the previous study by Link and his colleagues (1999), schizophrenia was usually seen as unpredictable and dangerous (Angermeyer & Dietrich, 2006). This review article points to the enduring nature of stereotypes of persons with mental illness among the public and also highlights an important point of the lay opinions about what constitutes a mental illness. That is, lay people routinely sees psychotic symptoms or behavior such as talking to self and hearing voices as being indicative of mental disorders. This also implies that overt, behavioral symptoms are a cue to most public as a sign of mental illness and is important because in stereotype research, these overt cues may well be the trigger of automatic processing of stereotypes.

**Implicit attitudes toward mental illness**

Besides surveys on attitudes and beliefs regarding mental illness, Stier and Hinshaw (2007) also emphasized the importance of examining implicit stigma towards mental illness
beyond the usual explicit self-reported measures due to the potential negating factors of social desirability. They argued that implicit bias predicts other forms of discrimination and are, often, different from explicit measures' predictions. Therefore, there is added value in examining implicit biases (Stier & Hinshaw, 2007). The authors recommended the use of the Implicit Association Test (IAT; Greenwald & Banaji, 1995) and the Go/No Go Task (GNAT; Nosek & Banaji, 2001) in future studies looking at implicit bias in mental illness stigma. The IAT is a widely-used and studied paradigm that was designed to assess implicit attitudes purported to be outside of one's conscious control (Greenwald & Banaji, 1995). A meta-analysis on the IAT has generally indicated significant predictive validity of behavior, judgment and physiological measures and also demonstrated incremental validity over self-report measures especially in topics that are vulnerable to societal norms and impression management (Greenwald, Poehlman, Uhlmann, & Banaji, 2009). The GNAT is based on the same underlying principles as the IAT but instead of having two contrasting categories, respondents are asked to response to positive associations and to inhibit actions otherwise (Nosek & Banaji, 2001).

In one of the first studies examining implicit biases in mental health stigma, Teachman, Wilson, and Komarovskaya (2006) found strong evidence for implicit bias towards persons with mental illness (e.g., helplessness and blameworthiness). This result was significant even when there was no corresponding report of explicit bias, thereby underscoring the importance of implicit measures. One other sobering pattern of findings was that there was no in-group bias for people with mental illness — they endorsed equally significant levels of implicit bias (Teachman et al., 2006). Another informative study on implicit measures of stigma towards mental illness examined the potential moderating variable of culture. The authors found that implicit measures pointed to stigma occurring at both the automatic and more controlled processes and the implicit
measures differentiated stigma between physical and mental illness (Cheon & Chiao, 2012). Taken together, the preliminary findings from implicit measures of mental health stigma seem to parallel results from more explicit measures (for a thorough conceptual review of implicit measures in social cognition, see Fazio & Olsen, 2003).

Monteith and Pettit (2011) compared differences between explicit and implicit measures of stigma towards persons with depression using an experimental approach. By manipulating the diagnosis (depression vs. physical illness) in a vignette, the online study examined the differences in attitudes and beliefs in the participants. Explicit attitudes were measured by a self-report questionnaire while implicit attitudes were assessed by the use of the Implicit Association Task. The authors compared the measures and found significant differences. Specifically, when compared to physical illness, implicit measures indicated more negative attitudes towards depression and lower temporal stability of depression while there were no such results for the explicit measures (Monteith & Pettit, 2011). This study represents a preliminary step towards laboratory studies looking at mental illness stereotype activation and highlights the importance of looking at implicit measures beyond a self-report or interview.

From the above surveys examining both explicit and implicit attitudes towards persons with mental illness, it is evident that the most common attitudes and beliefs about persons with mental illness are negative. The idea of dangerousness and unpredictability also appears to be a common theme in large surveys of attitudinal measures. Correspondingly, it follows that dangerousness, uncontrollability, and unpredictability are some common stereotypes that are likely to be activated under appropriate circumstances.
Chapter 3: Prevalence of Violence in Persons with Mental Illness

A related issue when one considers mental health stigma is the controversy over the actual base rate of violence amongst persons with mental illness (Borum, 1996; Link, Andrews, & Cullen, 1992; Monahan, 1992). One oft-mentioned argument revolves around whether the stereotypes of violence and aggression are “inaccurate stereotypes or reflections of important realities” (p. 275, Link et al., 1992).

In his 1991 APA Award Address, Monahan (1992) discussed the contentious issue of the relationship between mental disorder and violent behaviors. His main arguments were that mental illness and violence did indeed have a modest relationship, but that the extent, and synergistic impact, of other important factors (e.g., age, socioeconomic status, neighborhood) on this relationship were not yet well studied (also noted by Link et al., 1992). Monahan (1992) went on to suggest better ways of teasing apart the differential impact these hypothesized variables may have by: i) comparing the rate of violence among persons with mental illness and a comparable community sample; and ii) comparing the incidence of mental illness among offenders and a comparable community sample. Lastly, he also emphasized that in spite of any modest statistical relationship found, most persons with mental illness are not, and have never been, violent (Monahan, 1992).

As Monahan (1992) and other researchers have highlighted (Morenoff, Sampson, & Radudenbush, 2001), neighborhood factors play an integral role when one considers the base rate of violence. In an informative study to control for this variable, Steadman and colleagues (1998) compared rates of violent behaviors among residents, with and without mental illness, in the same neighborhood. For this study, adults with mental illness were interviewed every 10 weeks for a year after their discharge from an inpatient facility. Violence was measured by self-report
and official sources which were collateral information obtained from the police and hospitals records. The authors found no differences in rates of violence between patients without a co-occurring substance relative to a comparison group also without substance abuse. What was striking, however, was the incremental risk of violence when substance abuse was considered. There were also a greater proportion of patients, relative to their counterparts with no mental illness, who reported abuse of substances. A related compelling finding highlighted that, across the violent behaviors reported by persons with mental illness, the large fraction was towards family members and friends/acquaintances (86.2%) and in homes or other residences (69%). This is in direct contrast to fears of being a stranger victim of someone with mental illness. In fact, a noteworthy difference in this study was that the community sample was significantly more likely to exhibit aggression in public areas (e.g., bars) as compared to the mental illness sample (Steadman et al., 1998).

Corroborating evidence of the relative weight of substance abuse as a predictor of violence was obtained in another study (Elbogen & Johnson, 2009). The authors analyzed data from the National Epidemiologic Survey on Alcohol and Related Conditions, a large nationally representative survey on variables related to mental illness, violence, and other related factors. Results indicated that the most robust and reliable risk factors for violence were a combination of several variables, and not a single factor was a reliable predictor. Notably, mental illness as a diagnosis per se, did not predict violence. Some variables highlighted in the study included historical risk factors that have been associated with violence (e.g., presence of past violence, juvenile detention, physical abuse), reported substance abuse/dependence alongside mental illness diagnosis, perceived threats, younger age, being male, low income, and recent events such as divorce and unemployment (Elbogen & Johnson, 2009).
Recent nationwide epidemiological studies and more focused longitudinal studies have both supported a relationship between mental illness and violence only when other important factors are taken into consideration (i.e., concurrent substance abuse, younger age, and low income) (Elbogen & Johnson, 2009; Robbins, Monahan, & Silver, 2003). The overwhelming evidence reveals that it is not just having a mental illness, or certain symptoms (e.g., delusions, see Appelbaum, Robbins, & Monahan, 2000), that leads to aggressive behavior. Rather, it is the combination of circumstances and individual characteristics, for example, having a past violent incident, being in a less privileged environment, substance abuse, and noncompliance with medication among other factors that precipitates violent behavior. Therefore, the use of a mental illness diagnosis, in and of itself, as a sole and strong predictor of violent behavior is misleading, inaccurate, and unhelpfully stigmatizing (Elbogen & Johnson, 2009; Fuller, 1994; Steadman et al., 1998). Along this same line, it is erroneous to solely use the presence of a mental disorder as a unique, retrospective attempt at explaining any violent incident. As perhaps best articulated by Monahan (1992), “none of the data give any support to the sensationalized caricature of the mentally disordered served up by the media” (p. 519).

Indeed, one hallmark of a stereotype is the ease in which one may be inclined to rely on it as a default in social judgments (e.g., Bargh, 1994, 1999; Dunning & Sherman, 1997). In the case of mental illness, as discussed earlier, the overwhelming negative stereotypic traits associated suggest that consequently, the general public may unfortunately view someone with mental illness through that lens. Most studies have also cautioned against categorizing mental illness as a homogenous group (Fuller, 1994; Monahan, 1992; Steadman et al., 1998) which further highlights a potential problem that may be exacerbated by the media if they have a tendency to present mental illness as a collective group. The current review thus aims to
understand the mechanisms by which stereotypes come to be and are maintained and related information processing biases that may be undertaken by the general lay person when they come across a media portrayal of mental illness and violence.
Chapter 4: Mechanisms in Stereotype Activation

Given the prevalence of negative stereotypes about mental illness, it is important to consider how stereotypes form and what factors lead to their activation. There has been a wealth of discussion surrounding stereotypes, their proposed mechanisms, and their implications for the field of social cognition. Stereotypes are generally conceptualized as a derivative of social categorization (Park & Rothbart, 1982; Fiske & Taylor, 2013) and are “beliefs or associations that link whole groups of people with certain traits or characteristics” (p. 148, Kassin, Fein, & Markus, 2011). Stereotypes have been found to have an implicit influence in human social life that may be out of one’s conscious volition (Dunning & Sherman, 1997). An important concept in relation to stereotypes is the presence of in-groups and out-groups; the former refers to a group one affiliates with and the latter refers to people who are deemed to not belong to one's identified group (Kassin et al., 2011). This concept of in-groups versus out-groups has implications for how people categorize other social beings and the resultant biases that may occur as a consequence. Some examples of stereotypic concepts that have been studied in the laboratory have included increased hostility observed after priming participants with Black faces (Bargh, Chen, & Burrows, 1996), worse performance at math after being primed with being a female (Steele, 1997), and slower walking speed when the stereotype of old age was activated (Bargh et al., 1996). In these (and other similar) experiments, the notion of the stereotype is typically primed (often subliminally or via an ostensibly unrelated task) in the participants and then measured on a subsequent task.

Dual process models in cognitive processes have been a popular conceptualization of the brain’s mechanisms and have been used on various topics such as information processing in attention (Shiffrin & Schneider, 1977), stereotype activation (Devine, 1989), and judgment and
decision-making (Kahneman, 2003, 2011). In her widely cited paper on the theory describing how stereotypes work, Devine (1989) proposed a dual-process model consisting of stereotype activation and stereotype application. She argued that the former was an automated process that occurs largely beyond the control of conscious efforts while the latter process was a controlled process in which inhibition of the stereotype could occur. Other researchers since have been either on the side of the pervasiveness of automaticity (e.g., Bargh, 1994, 1999; Greenwald & Banaji, 1995) or on the side of a more moderated process of the automaticity of stereotype activation such that activation only occurs under specific conditions (e.g. Blair, 2002; Casper, Rothermund, & Wentura, 2010; Wittenbrink, Judd, & Park, 2001a, 2001b). Blair (2002) contended that the automaticity of stereotypes is not as inevitable and rigid as research has suggested (Bargh, 1994, 1999; Devine, 1989).

Researchers arguing for the automaticity of stereotypes highlighted the robust finding of stereotype activation across several tasks and that the activation usually occurs outside of, and sometimes, in spite of, one’s conscious awareness (see Bargh, 1999; Bargh & Chatrand, 1999; Uleman, Saraji, & Gonzalez, 2008 for an in-depth discussion and review). This phenomenon runs parallel to research on subliminal priming (an oft-used method in stereotype research) where people have been found to have a lack of awareness about their mental processes. Subliminal priming refers to the presentation of a priming stimulus that is outside of one's reported conscious awareness (e.g., Dijksterhuis et al., 2004). In their seminal article, Nisbett and Wilson (1977) argued that introspection is limited: people are generally not aware of their thought processes when the stimuli are not obvious or plausible, and when asked to explain their behavior, they tend to rely on a priori hypotheses and assumptions. Given this argument, it is plausible that subliminal influence can exert its effect via another non-conscious, automatic,
pathway. In the same vein, automatic processing of stereotypes may also operate non-consciously.

In more contemporary research testing specifically the implications of subliminal priming on overt stereotypical behaviors, Bargh and his colleagues (1996) subliminally primed participants with the stereotype of African American in their third experiment. Participants subliminally primed with the young African American male face exhibited more hostile behaviors towards the experimenter following an ostensible technical failure during the experiment. The authors concluded that their finding replicated Devine’s (1989) study on the automated effect of racial stereotypes. Working on a similar line of study, Dijksterhuis and colleagues (2000) subliminally primed participants with elderly stereotypes, not related specifically to forgetfulness, and gave them a surprise recall test thereafter. The results showed that the degree to which participants associated ‘elderly’ to ‘forgetfulness’ predicted worse performance on the recall task. Generally, studies in this area have lent support to the effectiveness of subliminal priming and activation of stereotypes in associated behaviors and judgments.
Chapter 5: Factors Affecting Stereotype Activation

Since the initial conceptions of the automaticity of stereotype activation, there has been subsequent research challenging the automated nature of stereotypes. Studies have thus investigated the different factors that may impact the precipitation of stereotypes. Given the complex nature in the make-up of society in the United States, it is reasonable to consider the influence of competing social categories and the ensuing interaction of all categories (e.g., age, gender, and race) and other variables that may impact on stereotype activation such as goals and mood in social judgments.

Social categories

Gardner, Macintyre, and Lalonde (1995) looked at the results of juggling several social categories (i.e., ethnicity – French and English Canadian, age, and gender) and how that impacts judgments and remembering. The study required participants to first make judgments about groups (i.e., males, females, 20-year-old, 70-year-old) on dichotomous traits such as quiet-talkative, unemotional-emotional, rugged-delicate, and modern-traditional. Their response and latencies were recorded for these judgments and generally, stereotypic traits were found to be judged more rapidly than non-stereotypic traits (i.e., faster judgments of 'rugged' for males and 'delicate' for females). The next phase of the study included presenting eight stimulus target individuals described in terms of the three reference groups (e.g., Person 1 is a 70-year-old French Canadian male and Person 2 is a female 20-year-old English Canadian, in a counterbalanced order) and were asked to rate these individuals on separate attributes. The final part of the study involved remembering what the gender, age, or ethnicity of the target individual was in which accuracy and speed were measured. Results obtained indicated that people appeared to group age and gender together separate from ethnicity (e.g., there was a difference in
response latency between 70-year-old females and 20-year-old males; and French Canadians took a longer time than English Canadians). Participants were also significantly faster in remembering age and gender, relative to ethnicity in this study, and the authors explained that it may be due to more infrequent usage of French versus English Canadian ethnicity compared to age and gender. They noted that in group judgments, stereotypic trait effects were observed such that female group targets were judged to be more typical of the single female trait, relative to males. That is, 70-year-old female was judged to be more delicate compared to a 20-year-old male. The authors also concluded that respondents were fastest in judging the category of age as participants were all young college students; age in this case was the most different between the perceiver and target person. An interesting point noted was that “the most salient feature is the one that provides the greatest discrimination from other persons in the social context, making it the most informative dimension” (p. 480, Stangor et al., 1992, as cited in Gardner et al., 1995). This suggests that the most distinctive (whether visually, auditorily, or olfactorily) feature may be the one variable that captures a lay person's attention and activates any associated stereotypes. When considering the more externalizing and odd behaviors someone may associate with mental illness, it is reasonable to assume that those features may be the salient ones that are calling for attention.

Goals

Another example examining the impact of different variables is a study conducted by Moskowitz, Gollwitzer, Wasel, and Schaal (1999) who evaluated the effects of possessing egalitarian goals on gender stereotype activation. They compared differences between the participants who have chronic goals of gender equality and those without. The results they obtained indicated that participants with chronic goals of equality did not appear to show the
same type of stereotypic activation. The authors argued that it is evidence that the implicit activation of a long-held goal extends its effort to inhibit stereotypic activation (Moskowitz et al., 1999). It may be that this is one individual difference that differentiates a prejudiced individual from someone who is less prejudiced.

**Types of judgments**

Wittenbrink and colleagues (2001a) investigated the extent to which the nature of the judgments (conceptual versus evaluative) would affect whether racial stereotypes are activated and subsequently affect responses. The authors measured conceptual judgments using a lexical decision task (word or non-word) and evaluative judgments by asking participants to choose between positive or negative (good or bad). The results supported their hypotheses that the types of judgments resulted in different automatic responses: The conceptual judgment condition induced facilitation to valenced items that are indicative of the primed group while the evaluative judgment condition led to a broader facilitation of all negative valence for the out-group and positive valence for the in-group (Wittenbrink et al., 2001a). The authors concluded by highlighting the different nature of the automaticity and the different ways it may be manifested depending on the type of judgments asked.

**Context**

On a similar note looking at factors that impact stereotype activation, Wittenbrink et al. (2001b) manipulated the contexts in which racial primes occurred and found evidence supporting a specific activation of context-dependent stereotypes. That is, a negative evaluation of Blacks was only activated when paired with a street-corner context (as induced by a picture) compared to when participants were shown a picture of a church. Casper et al. (2010) replicated Wittenbrink et al.’s (2001) study using different contextual and social categorical primes (e.g.
Bavarians, Asians, and Arabs) and found support for an interaction between context and categories. The authors concluded that automatic stereotypical activation does not occur inevitably, but is dependent on the context in which it appears in. However, as the authors appear to be using the same person variable stereotypes, it may be that the stereotype is still being primed. The stronger primed effect then occurred when context is added into the equation.

**Cognitive style**

Besides the importance of goals, another variable that has been examined in individual differences in the automaticity of stereotypic activation is the need for cognition (Florack, Scarabis, & Bless, 2001). The need for cognition refers to “a need to structure relevant situations in meaningful, integrated ways…a need to understand and make reasonable the experiential world” (p. 291; Cohen, Stotland, & Wolfe, 1955). Florack and colleagues (2001) cited prior research which suggested that people with lower need for cognition appeared to be more influenced by stereotypes. Results from their study supported this trend and the authors proposed that this difference is due to more elaborate and deliberate processing of “corrective mechanisms” (p. 522) and consideration of other pertinent factors among people with a higher need for cognition. This suggests that stereotype activation occurs at a more automatic level, but can be negotiated if one spent more time and effort in considering other potential influential variables or possess the resources to negate the stereotypes.

The need for closure is another cognitive processing style that has been examined in terms of individual differences and its potential implications in social judgments. Webster and Kruglanski (1994) defined the need for closure construct generally as an individual’s inclination and preference to obtain answers, regardless of its accuracy, when faced with ambiguous situations. They further described five facets of someone high in dispositional need for closure:
prefers order and structure, expresses uneasiness with uncertainty, prefers having answers which manifest in rapid judgments and choices, possesses low openness to new experiences and situations, and would rather not seek out information that challenges held knowledge (Webster & Kruglanski, 1994). Need for closure has been found to be related to conservative beliefs and racism (van Hiel, Pandelaere, & Duriez, 2004), impact on negotiations in group interactions (De Grada, Kruglanski, Mannetti, & Pierro, 1999), and affects in-group biases in beliefs and attitudes (Shah, Kruglanski, & Thompson, 1998).

**Mood**

Another area of study that has been implicated in the extent of stereotype activation is the role of affect (Bless, Schwarz, & Kemmelmeier, 1996). Specifically, different moods have been experimentally induced and examined with regards to their influence on stereotype activation. Generally, findings from the literature indicates that positive affect (typically happy mood) has been associated with increased use of heuristics and taking a global perspective; whereas negative affect (usually sad mood) has been linked with more in-depth and detailed processing (Bodenhauser, Kramer, & Susser, 1994; Gasper & Clore, 2002; Park & Banaji, 2000). Being in a sad mood has also been found to be associated with a higher likelihood of correcting negative stereotype endorsement, and impression formation, when the stereotypes were deemed inappropriate for the social judgment situation (Lambert, Khan, Lickel, & Fricke, 1997).

There have been several theories proposed on the mechanism by which mood affects stereotype activation (Clore and Huntsinger, 2007; Forgas, 1995; Lerner & Keltner, 2000). One widely-cited and discussed theory, *affect-as-information*, is neatly reviewed by Clore and Huntsinger (2007) who presented evidence in support of it. Basically, this theory posits that affect is one source of information that people take into account when they engage in further
processing. That is, affect informs on the depth, value, and type of processing that one eventually choose to engage in (Clore & Huntdinger, 2007; Schwarz & Clore, 1983). Forgas (1995) conceptualized a comprehensive model where he included other variables such as the target person’s attributes (e.g., familiarity and typicality), one’s own characteristics (e.g., motivational goals and cognitive capacity), and situational constraints (e.g., focus on accuracy and social desirability).

More recent research in this area has moved towards differentiating between types of emotions (e.g., anger and sadness), rather than viewing emotions as belonging to two categories, i.e., positive and negative valence. This aspect of research has largely focused on judgment of causality in social contexts (Keltner, Ellsworth, & Edwards, 1993; ), judgment of risks and associated decision-making (Lerner, Gonzalez, Small, & Fischhoff, 2003; Lerner & Keltner, 2000; Lerner & Tiedens, 2006). Generally, studies have found differences suggesting differential implications of anger and fear. Specifically, anger has been associated with more optimistic estimates when asked about risks of death due to medical diseases and natural disasters. The reverse pattern was found for participants induced in a fearful mood (Lerner & Keltner, 2000). Similar results were found when risk of terrorism attacks was measured using 9/11-related news articles as stimuli (Lerner et al., 2003). Lerner and colleagues (2000; 2003) explained that anger tends to make people feel more in control and certain about their world views and beliefs whereas fear increases one’s uncertainty and decreases feelings of being in control.

Another direction in contemporary research on mood and stereotypes is on the generalizability of affect’s impact across situations to better inform on its mechanism of influence. For example, the relationship between positive affect and increased stereotyping was
examined across situations to probe for possible variance in its impact. Huntsinger and colleagues (2010) examined the effects of the type of accessible thoughts available and its influence on stereotype activation. One way in which they manipulated accessibility was by priming with stereotypic and counter-stereotypic images (e.g., for the concept of female, exposing participants to a picture of a flower and strong female leader, respectively). When primed with counter-stereotypic stimulus, participants induced in a positive mood were more prone to endorsing less stereotypic beliefs (measured by an implicit association task) than when in a negative mood. The authors found similar results when egalitarian goals were primed in participants, leading them to conclude that the influence of positive affect on stereotyping is contingent on the available thoughts people hold at the time of judgment (Huntsinger et al., 2010).

News reports on social issues, such as crime, natural disasters, and health, can understandably elicit moods according to their depiction (Goodall, Slater, & Myers, 2013; Gross, 2008; Nabi, 2003). Given the impact mood has on subsequent stereotype activation, it is interesting to examine the types of emotional responses that are typically ascribed to news reports involving mental illness and violent incidents. Unfortunately, this area has not yet been widely studied. In one online experiment designed to examine the role of emotions in reaction to news reports of crime and accidents, the authors manipulated the inclusion of the variable of interest, alcohol as a causal factor of the incident (Goodall et al., 2013). They found that overall, participants had a tendency to attribute blame to the individual rather than consider the extenuating circumstances also reported. This relationship was also found to be attenuated by anger, relative to fear, that is, those who reported greater anger had a higher likelihood of blaming the protagonist. Of particular relevance here, when the stories were manipulated to
show alcohol use as a causal factor, participants reported higher levels of anger and blame. They also endorsed greater support for policies advocating greater enforcement of alcohol control laws, which was not found in participants who reported more fear than anger (Goodall et al., 2013). Extrapolating from this finding to news report of mental illness and violence, similar results may be expected in cases of violent news, that more blame will be attributed to the individual with mental illness and there may be a greater call for more controlling public policies.

As discussed above, there are other factors that come into play when we consider the mechanism in which stereotypes are activated automatically. In all these experiments though, stereotypes of the target group of people, whether positive or negative, still appeared to be activated and endorsed. For example, in Wittenbrink et al. (2001b), a Black prime when paired with a positive context of a family barbecue demonstrated a significantly large decrease in prejudice than when shown a negative context of a gang-related incident. Thus, the overall picture of stereotype activation seems to point to a contextual- (e.g., type and nature of judgment) and individual- (e.g., cognitive styles and mood) based automatic activation. For an in-depth review the different underlying theories and contextual factors to the stereotyping process in general, refer to Hilton and von Hippel (1996). This conceptualization of automatic stereotype activation has arguably more ecological validity in that most people do not function in a vacuum and will have context-dependent goals, information processing style, and varying knowledge of certain groups of people. What ends up being precipitated then is the result of the configuration of one's own idiosyncrasies (e.g. need for cognition, Florack et al., 2001; mood, Huntsinger et al., 2010; Park & Banaji, 2000; Schwarz, 2001), the context (Wittenbrink et al., 2001b), types of judgment (Wittenbrink et al., 2001a), and goals (Moskowitz et al., 1999).
Racial stereotypes and dangerousness

A related area of research in the United States, which is informative when considering perceptions and stereotypes of dangerousness, is on racial stereotypes and their impact on people’s perceptions of danger and violence. Payne (2001) investigated the extent to which racial cues (Black versus White faces) had an effect on perceiving the existence of weapons in two separate experiments. He found that, when primed with a Black face, participants were quicker and more likely to mistake a hand tool for a handgun. In addition, Payne (2001) also attempted to tease out automatic and controlled processing and found evidence to support that the two processes are separate and function independently. He concluded that there should theoretically be two conditions for the bias to occur: presence of stereotypic features and a lack of an opportunity to control one's responses.

Another study examining racial stereotypes and dangerousness took an interesting approach, and tested whether primed danger stereotypes in participants would affect their attention to Black versus White faces (Donders, Carroll, & Wittenbrink, 2008). The authors obtained evidence that supported their hypotheses: When primed with fear, participants appeared to allocate more attention to Black faces after controlling for prejudice and danger-irrelevant stereotypes. They then concluded that Black faces may be a “fear-conditioned stimulus” in line with learning and conditioning principles (Donders et al., 2008).

As outlined above, the overall literature on the nature of stereotypes generally support the account of an internalized social construct with its associated stereotypes which then gets automatically activated when the perceiver is in contact with a member of a group that the perceiver is able to discern. The moderating factors that affect the response latency and judgments include the presence of other social categories (Gardner et al., 1995), goals
(Moskowitz et al., 1999), context (Wittenbrink et al., 2001a), nature of judgments (Wittenbrink et al., 2001b), and individual-level differences such as need for cognition (Florack et al., 2001).
Chapter 6: Media and Stereotypes

Following the discussion on the mechanisms underlying stereotype activation, it is informative to now consider a review of the valence and type of mental illness stereotypes that are propagated by the media. The literature review began with a discussion on the attitudes towards mental illness which were found to be generally negative and hypothesized to be due to the negative stereotypes held by the lay public. The role of media in shaping societal consensus has been noted by several researchers (Angermeyer & Matschinger, 1996; Jorm, 2000; Thornton & Wahl, 1996; Wahl, 1992) and particularly relevant here, attitudes towards crime and justice (Dowler, 2003). It is thus essential to delve into for a better understanding of how these attitudes held came to be.

An important area of consideration in the shaping and perpetuation of mental illness stereotypes in the United States is the role of media such as television, newspapers, radio, and more recently, the internet (Bornstein, 1992; Corrigan et al., 2005; Stuart, 2006; Wahl, 1992; Wahl, Woods, & Richards, 2002). Studies investigating the depictions of mental illness have examined newspaper reports (Corrigan et al., 2005; Wahl et al., 2002) and television programs (Diefenbach, 1997; Granello & Pauley, 2000). The overall conclusion reached by these authors is that the media influences the public’s agreement with negative stereotypes through its predominantly negative depictions of individuals with mental illness. In fact, an early review on this topic concluded that: a) mental illness is frequently represented in the mass media and through various mediums (e.g., magazines, television, and films); b) presentations of mental illness are usually inaccurate with an emphasis on negative attributes (e.g., social and occupational failures, psychotic symptoms); c) these media portrayals are likely to have an impact on the public's perception of mental illness (Wahl, 1992). In subsequent research,
portrayals of persons with mental illness have also been found to be associated with danger, committing violent crimes, being a negative burden on society, and having a poor quality of life (Corrigan et al., 2005; Diefenbach, 1997; Stuart, 2006; Wahl, 2003).

Outside of the United States, similar findings on the portrayals of persons with mental illness have been observed. A review of studies on media content of mental illness and its influence on attitudes across several countries concluded, on a similar note, that media depictions are often exaggerated, inaccurate, and disproportionately focused on dangerousness (Klin & Lemish, 2008). The authors also noted that the research at this stage lacks empirical, well-controlled studies in terms of the mechanism of how public perceptions are influenced by media portrayals.

Corrigan and colleagues (2005) analyzed the content of newspaper articles on mental illness in 70 major US newspapers across 6 discrete periods over a year. They found that the most common theme across the stories was dangerousness which accounted for 39 percent of all news articles collected. Within the broader theme of danger, the two most common topics were on violent crimes and suicidal or self-injurious behaviors. The authors noted that the proportion of dangerousness-themed articles seemed to be on the decline, but noted that it such articles still were in the majority and that violent crimes were, more often than not, featured prominently in the newspaper. A positive finding was that there were more articles on treatment and recovery rather than blame (Corrigan et al., 2005).

Clement and Foster (2008) took a step further in considering the quality of reporting in mass media and compared newspaper reporting on schizophrenia in the United Kingdom between two time points – 1996 and 2005. Some of the indicators of poor quality of reporting adopted in the study include the use of 'stigmatizing descriptors' such as 'nutter' and 'maniac',
linguistically equating the person with schizophrenia, and presenting schizophrenia as the main, significant factor for risk of violence. Overall findings suggested that quality of reporting did not improve in 2005 since 1996. In particular, about one in seven articles included the use of a stigmatizing descriptor and there was evidence suggesting that schizophrenia was still seen as a precursor to unpredictable and violent behavior as only about 2% of articles on violence presented the risk of violence in an appropriate manner (Clement & Foster, 2008).

Besides newspaper reports on persons with mental illness, another source of media commonly studied is television viewing. Angermeyer and colleagues (2005) compared watching television programs and reading news articles with the impact on reported attitudes towards persons with mental illness in a German population. A positive correlation was found between amount of television viewed and increased desire for social distance from people with mental illness. The finding for newspaper report was illuminating in that overall reading of newspapers had no effect on social distance. Instead, it was the type of newspaper that participants reported reading that significantly correlated with social distance. Specifically, respondents who reported regularly reading tabloids and regional newspapers also indicated higher preference for social distance as compared to participants who reported reading broadsheets or no newspapers (Angermeyer, Dietrich, Pott, & Matschinger, 2005).

In another interesting analysis looking at the type of television programs viewed and their relationship with attitudes toward mental illness, Granello and Pauley (2000) surveyed college students who reported television as their primary source of information on mental illness (about 34% of the whole sample). The same researchers have previously found that participants who reported media as the main source of information on mental health also adopted more punitive and less tolerant attitudes toward mental illness (Granello, Pauley, & Carmichael, 1999). For the
current study, they were interested in replicating the results and specifically examine the type of television content viewed. Results indicated that hours reported watching television positively correlated with increasing intolerance towards persons with mental illness. The authors further examined the type of programs reported and its relationship with specific attitudes. Specifically, they found a positive correlation between watching soap operas and prime-time sitcoms and rigid and punitive attitudes towards persons with mental illness which they attributed to the higher frequency and more inaccurate portrayal of mental illness in these programs (e.g., Wahl & Roth, 1982). However, a negative correlation between consumption of news and viewing persons with mental illness as a threat was also found. This finding did not seem in line with other research on negative news reports of mental illness. One limitation of the study was the self-reported categories of television programs and the relatively young sample of participants (18 to 31 year olds) which may present only the viewing habits of one particular demographic group. Nevertheless, the findings supported the authors' contention about the significant influence media has in shaping public beliefs.

There have been several experimental studies that examined the effects of media and reported attitudes towards mental illness. In one of the first experimental designs testing the direct effects of media consumption, Wahl and Lefkowits (1989) showed college students a film depicting a killer with mental illness and examined their reported attitudes towards mental illness thereafter. Compared to the control group, participants who viewed the film endorsed significantly more negative attitudes towards persons with mental illness. Additionally, using a film trailer as a potential mitigating variable to warn participants that mental illness has no relationship with violence was found to be ineffective in influencing reported attitudes (Wahl & Lefkowits, 1989).
In a replication of the above study with news articles, Thornton and Wahl (1996) tested the influence of a newspaper report on a violent crime and subsequent reported attitudes toward persons with mental illness. For their study, they also included a condition where they added an article that explicitly corrects misconceptions about mental illness, in particular, the base rates of violence, to test for potential moderating effects of corrective information. Results obtained supported their hypothesis that the newspaper article (adapted from an actual report) led to increased punitive attitudes and less acceptance toward persons with mental illness. On a more optimistic note, corrective information led to a decrease in negative attitudes. The corrective information used in the study included highlighting common misconceptions about mental illness, facts about the actual rare occurrence of violent incidents involving persons with mental illness, and the tendency of the media to portray mental illness in a misguided manner (Thornton & Wahl, 1996).

To test the effects of providing more accurate information of mental illness in the media, Penn and colleagues (2003) compared reported attitudes and beliefs amongst participants who were exposed to either no documentary films, documentary films about unrelated topics, and documentary on schizophrenia. Participants who were in the schizophrenia documentary condition reported less blame and personal responsibility towards persons with schizophrenia. Results for the overall attitude (i.e., perceived dangerousness and affective reactions) and social distance were less promising – although there appeared to be a trend in less negative attitudes, the means were not significantly different from the other groups. The authors concluded that mere 'educational' strategies may not be effective in reducing stigma and recommended the inclusion of other strategies to reduce stigma (Penn, Chamberlin, & Mueser, 2003). Another study looking at the educational effects of an accurate depiction of mental illness in a
documentary film found similar results in terms of increasing the public's knowledge (Kimmerle & Cress, 2013).

More recent studies examining the effect of newspaper articles have found similar results. One study manipulated the valence of the media news article (positive, neutral, or negative) and examined the effect on people’s attitudes towards mental illness thereafter. Results supported the contention that after reading negative articles on mental illness, participants reported more stigmatizing attitudes via a self-report measure (Corrigan, Powell, & Michaels, 2013). Another empirical study investigated the effects of news articles depicting mental illnesses alongside gun control policies by randomly assigning online survey participants to four conditions (exposure to gun and mental illness only, and to both; and a no-exposure group). The authors found evidence supporting that news portrayal of mass shooting events prompted more severe reported attitudes towards serious mental illness (McGinty, Webster, and Barry, 2013).

Experimental approaches to studying the relationship between media and mental illness stigma have largely focused on the influence of negative media depictions and resulting attitudes toward mental illness. The overall results support a similar pattern of findings – that media portrayal of mental illness exerts an influence on reported attitudes, at least soon after the exposure. Some studies have taken a step further and examined potential mitigating factors using corrective information in print (Thornton & Wahl, 1996) and in film (Wahl & Lefkowits, 1989) and more accurate documentaries (Kimmerle & Cress, 2013; Penn et al., 2003) which has produced mixed findings. However, the question that remains is how, and why, this influence occurs.
Chapter 7: Understanding Stigma in the Media

Social psychology has a long and rich history of studying stereotypes and provides a most informative parallel to understanding the mechanisms underlying the stigma towards mental illness. Applying psychological theories to mental illness stigma, the following three main areas have generally been proposed to explain why people stereotype: cognitive (e.g., categorization, illusory correlations, confirmation biases), motivational (e.g., social identity, just world hypothesis, terror management theory), affective approaches (e.g. classical conditioning, misattribution), and social cognitive factors (Corrigan, 2000; Corrigan & Cooper, 2005; Corrigan, Watson, & Ottati, 2003; Ottati, Bodenhausen, & Newman, 2005).

One affective approach that has been proposed is using the principle of classical conditioning in understanding how people adopt certain stereotypes of mental illness more easily than others. Ottati and colleagues (2003) proposed that the general consensus of negative beliefs and attitudes and media portrayals of mental illness are two common sources (i.e., unconditioned stimulus) in which most of the public receive their information on mental illness. In the former case, children are socialized into stigmatizing beliefs with the assumption that people generally tend to react in a negative way to persons with mental illness. For the latter, given the propensity of media characters with mental illness to be depicted as dangerous, violent, and incompetent, the public then internalizes these associations through classical conditioning (Ottati et al., 2003).

The “just world” hypothesis (Lerner, 1980) is a motivational approach that seeks to explain the affective component of stereotype activation and endorsement (Ottati et al., 2003; Stangor & Crandall, 2003) and has also been theorized to operate on both explicit and implicit levels (Lerner, 1998). The premise of the “just world” hypothesis is the assumption that good things happen to good people while bad things happen to bad people. When something negative
happens to an individual then, one who adheres to this belief is motivated to construct a reason in line with this principle. With regards to mental illness, Ottati and colleagues (2003) suggested that if people generally believe that the onset of mental illness is within the individual's control, it will correspondingly increase stigma when something negative happens. Therefore, when persons with mental illness are portrayed as engaging in negative acts or being in an undesirable situation (e.g., being homeless), the view of that individual is that they just did not put in adequate effort to better their own situations. However, this seems to run contrary to the finding that increased knowledge about the neurobiological causes of mental illness may actually increase beliefs about dangerousness (Parcesepe & Cabassa, 2013; Pescosolido et al., 2010). This discrepancy suggests the need to further analyze the nature of knowledge the public holds about mental illness and how they consolidate all the obtained knowledge about mental illness. Consequently, it will also shed light on how the general public draws inferences about treatability and actions of persons with mental illness.

Corrigan and his colleagues (2003) adopted another motivational model and proposed that one's tendency to hold stigmatizing beliefs towards persons with mental illness can be explained by system-justification (Jost & Banaji, 1994). They contend that, as Western society discriminated against persons with mental illness in the past, people continued to hold and pass on stigmatizing beliefs and attitudes in order to maintain status quo. Additionally, the authors highlighted the media and entertainment system as an important source from where these beliefs are perpetuated (Corrigan et al., 2003). This model helps explain how and why negative attitudes towards mental illness came about and is a useful model to explain the current status quo.
Terror management theory, and its basis on mortality salience, has been another motivational approach that has been discussed by several authors to explain the occurrence of stigma (Solomon, Greenberg, & Pyszczynski, 1991; Stier & Hinshaw, 2007). From this perspective, when persons with mental illness are negatively portrayed in the media, they are consequently construed as threatening the societal order and one's own well-being. Therefore, endorsing stigmatizing attitudes towards the outgroup (i.e., persons with mental illness) serves to protect the self (Stier & Hinshaw, 2007). While terror management theory does have its intuitive appeal, especially with sensational news of purported mental illness and violence (e.g., Angermeyer & Matschinger, 1996; Corrigan et al., 2013; McGinty et al., 2013), the tenets of the theory stand on the very specific and narrow assumption of death saliency. The stigma of mental illness does not stand solely on the idea of dangerousness related to death and research has also highlighted other areas such as presumed difficulty in communicating with a person with mental illness, odd behaviors, and having limited access to desired social roles such as finding a romantic partner or a job (Schulze & Angermeyer, 2003). Therefore, terror management theory does not comprehensively explain the full experience of stigma towards persons with mental illness.

From a cognitive approach, the classic mechanism was the idea of categorization first proposed by Allport (1954). Categorization occurs when people label others based on perceived salient attributes which range from skin color, facial features, and gender to a person waving a knife around; or a label of a group (e.g., patients, skinheads, and Asians). The tendency and ease with which people use categorization in social interactions have been noted by many researchers (e.g. Devine, 1989; Tajfel, 1969) and has been implicated in interpretations of ambiguous behavior (Sagar & Schofield, 1980) and in the legal arena (e.g. jury decision-making,
Bodenhausen, 1988). In the widely-cited paper on how labels affect perceptions, Rosenhan (1973) underscored the significant consequences of labels and subsequent interpretations of a person by describing how normative behaviors were considered pathological after he and his colleagues were admitted into a psychiatric hospital with the label of schizophrenia. In relation to media portrayals of mental illness, categorization works in the same way, that is, the label of a mental illness comes along with its package of expected and at times, largely homogenous set of characteristics that people assume.

The influential line of heuristics work in the cognitive field by Amos Tversky and Daniel Kahneman (1973, 1974) has also been used to explain the impact media has in perpetuating mental illness stereotypes (Corrigan & Cooper, 2005). Highlighting several biases that people tend to use in social judgments (e.g., tendency to ignore base rates and mathematical principles of probability), Kahneman and Tversky (1996) argued that people are generally not logically accurate in these types of judgments. Well-known heuristics, or mental shortcuts, that have been studied include the availability heuristic and the conjunction error (Tversky & Kahneman, 1973; Kahneman & Tversky, 1996). The availability heuristic refers to the tendency of people to make judgments about frequency of a phenomenon based on how easily they can remember related events. Corrigan and Copper (2005) applied the availability heuristic in their contention that media coverage of sensational events involving both violent incidents and persons with mental illness increased the ease of these incidents in the general public’s mind. As a result, they believed that the public is then likely to associate dangerousness with mental illness.

More contemporary theories in social cognition have also been used to explain mental illness stigma. Corrigan (2000) applied social attribution theory (Weiner, 1980) to explain how lay persons perceive events related to mental illness, what types of information are salient to the
general public, one’s affective response, and the resulting behaviors. Specifically, he outlined a model with two distinct pathways: upon perceiving a person with mental illness, one can believe that the symptoms are uncontrollable (controllable) suggesting that the person is not responsible (responsible) for his/her situation which invokes pity (anger) and effects helping (punishing) behaviors.

The above theories have largely been proposed to explain the relationship between media depictions of mental illness and the general public's stereotypical beliefs which, more often than not, then lead to stigmatizing behaviors and attitudes. While the theories are informative about how the general public is influenced by media portrayals of mental illness and why these beliefs perpetuate, there is still insufficient research examining the mechanism in which people integrate and remember information that is presented to them in the media. The cognitive perspective has discussed some aspects of this issue by highlighting the various cognitive frames and tendencies of the human mind in interpreting information. However, more data is needed to better understand how people actually process information that the media presents to them and if there are any moderating factors that affect this process. For example, meritocratic worldviews (i.e. the role of personal responsibility and ability to control one’s life and events) have been found to be associated with more stigmatizing attitudes reported towards persons with mental illness (Rusch, Todd, Bodenhausen, & Corrigan, 2010). Racial differences have also been noted where African Americans appear to attribute less blame to persons with mental illness but higher perceptions of dangerousness, compared to Whites, after controlling for sociodemographic differences (Anglin, Link, & Phelan, 2006).

Another factor that has been found to impact on the degree of stigmatizing attitudes is level of contact with mental illness, where there have been some inconclusive findings about
increased contact with lesser stigma due to methodological differences (i.e. type and nature of contact) (Alexander & Link, 2003; Couture & Penn, 2003). Related research on stereotype activation and endorsement (e.g., role of context, need for cognition, and goals) as reviewed earlier would also be an important resource to consider. Examining the type and efficacy of these moderating factors seem especially pertinent in light of recent survey finding that about half the population surveyed indicated that they greatly blamed the mental health system, slightly more than easy access to guns and drug use, for recent gun shootings (Gallup Inc, 2013).
Chapter 8: Pragmatic Inference

Given the gap in the literature on cognitive processing of information presented by the media, the current review attempts to look at related areas of cognition that would be valuable to better illuminate this process. When considering the format in which information is presented by the traditional media (i.e., television, radio, films, newspaper), a notable pattern is observed whereby the flow of information is unidirectional. That is, the transmission of the contained information is from the media to the audience. By default, the interpretation of the information is thus placed on the shoulders of the audience and consequently, subjected to factors that affect information processing. A situation analogous to this is in the discourse analysis of linguistic interaction where findings from studies on discourse processing can be used to inform on the understanding process that an individual undertakes upon receiving information from the media.

One of the main areas in the cognitive approach to the study of discourse processing is on the process of inference. When reading or listening to a speaker, we generally undergo the process of inference where we attempt to make sense of the material being presented which then enables us to understand the material and form a representation of the stimuli in our mind. (For a comprehensive history and technicalities of pragmatics in psycholinguistics, refer to Carston, 2002). This process of inference is especially interesting as the product is the individual's understanding of the presented information which is largely determined by his or her interpretation.

In a nutshell, pragmatic inference posits that, during an interaction, the listener does not merely take in words of the speaker verbatim, but applies his or her own knowledge and understanding of the language and context. That is, the receiver engages in an active process of interpreting the meaning of the information that is being presented. At times, it may inevitably
result in an inference that can sometimes be “something neither explicitly stated nor necessarily implied” (Brewer, 1977, p.673). An example used to illustrate this concept by Brewer and his colleagues was the following: “The flimsy shelf weakened under the heavy books” would pragmatically imply “The flimsy shelf broke under the heavy books.” This implies a constructive model of communication and social interaction where the listener is not a passive audience understanding exactly the speaker's intentions and content, but is, rather, actively engaged in a constant process of interpretation. In the process, the listener may sometimes obtain something that means qualitatively different from the original message (Brewer, 1977; Johnson, Bransford, & Solomon, 1973). This phenomenon of discourse interpretation is useful in bridging attitudinal survey research in the media and mental illness literature with experimental approaches to stereotypes especially given the one-sided format of media dissemination.

An important difference between logical and pragmatic inference was highlighted by Brewer (1977) where he discussed the differences between the two concepts. Of the former, he emphasized the semantic relationship between a sentence (e.g., “John is taller than Jim”) and its logical derivative (e.g., “Jim is shorter than John”), whereas pragmatic inference occurs when the listener inferred an implication (e.g., “The karate champion broke the cinder block”) that was neither mentioned nor a logical implication of the original sentence (e.g. “The karate champion hit the cinder block”). This distinction is particularly important when considering its application in understanding media portrayals of persons with mental illness and how it affects people's general perception of mental illness. Even if the media article does not explicitly state a relationship between mental health status and the negative act, the audience is susceptible to inferring that relationship based on their pre-existing stereotypical beliefs of persons with mental
illness. Consequently, they may end up remembering that as the gist of information presented, consistent with the concept of pragmatic inference.

The study of pragmatic inference arose largely in the field of psycholinguistics where the probabilistic nature of information transfer between speaker/writer and receiver/reader has been duly noted and implicated in a variety of contexts including courtroom testimony (Harris, 1978), advertising (Harris, 1977), commercials (Searleman & Carter, 1988), attributional bias in people with bipolar disorder (Winters & Neale, 1985), and avoidant personality disorder (Dreessen, Arntz, Hendriks, Keune, & van den Hout, 1999). A related concept in memory research is Bartlett’s (1932) schematic theory of memory where he demonstrated that people construct their memory of events based on existing knowledge structures and beliefs of the topic they hold, and integrate new information into the existing schema. One of the well-known stimulus materials used was the Native American folk tale, *War of the Ghost*. Bartlett (1932) tested British participants’ recall of the presented story and found that they typically omitted material that did not make sense to them or changed words and events in a way that adhered to cultural norms. Some examples are remembering canoes as boats, seal-hunting as sailing expedition, and the ghosts as a clan called *The Ghost* or simply hallucinations. The story also became more clichéd in a way that was consistent to the British cultural norm (Brewer, 2000). Bartlett's demonstration of the influence of schema in memory recall is often used to illustrate the end product of a constructivist approach to discourse processing whereby the listener is engaged in a process of integrating presented information with his/her existing knowledge structures (Harris & Monaco, 1978; Brewer, 2000). These past studies and findings all contribute to the importance of existing knowledge and preconceived ideas and how they impact one’s interpretation of new information and subsequent integration of the information into one’s existing knowledge network.
When considering the presentation and propagation of information by the media, one noteworthy process that is important to highlight is its one-sided nature, both on the producer's (speaker or writer) and the receiver's (the audience) end. The presentation of the media content does not typically allow the receiver to have a voice in “real-time.” That is, the receiver does not get an opportunity to clarify and the producer does not get any instantaneous feedback from the receiver. This point is important because, in a typical interpersonal interaction, both parties would have an opportunity to modify their presented information based on feedback from the other party (Harris & Monaco, 1978). Additionally, as McKoon and Ratcliff (1991) argued, in the absence of an explicit goal which can direct one's strategies as to the type of information one is looking out for, people may tend to rely on existing knowledge and/or explicit information provided. The general layperson has arguably vague and varied goals when they digest presentations by the mass media. Therefore, it is likely that they tend to rely more on existing world views and/or any bits of information that they perceive as salient.

Therefore, the phenomenon of pragmatic inference in social communication and its influence on subsequent memory is a valuable mechanism to consider when we attempt to understand how people may be influenced by exposure to the media. As McDermott and Chan (2006) argued, the study of pragmatic inference is useful as it may be “the origin of many everyday false memories... a bridge between world-lists studies of false memories and studies of discourse comprehension” (p. 1274). Pragmatic inference is thus a helpful mechanism for understanding media effects of stereotype propagation and audiences' resulting endorsement. Its implications are wide-ranging, especially if one considers that it is hypothesized to work on a tacit level. In studies of pragmatic inference, one common finding across several studies was that participants generally did not report any significant difference between the
phenomenological experiences of false and real memories (Chan & McDermott, 2006).

Following this, it indicates that when people attempt to recall past experiences as a guide to interpreting and making judgments about other people, the memory may be skewed according to their prior expectations and the meaning of the memory will subsequently be distorted.
Chapter 9: Conclusion

Mental health stigma has become an increasing area of concern and has significant negative implications for people diagnosed with mental illness (e.g., Link et al., 1989; West et al., 2014). As stigma inherently involves the activation and application of stereotypical ideas of the targeted group, it is thus important to consider the nature of stereotypes when one attempts to understand the occurrence of stigma (Biernat & Dovidio, 2003). The extensive literature on stereotypes in social psychology is thus a great resource and has indeed been used to better understand the processes underlying mental health stigma. Prior research that has considered a social psychological framework has typically concentrated on explaining the reasons why and how people endorse and perpetuate the existing status quo and covers concepts ranging from a motivational framework to basic learning and conditioning principles (e.g., Corrigan et al., 2003; Ottati et al., 2003).

When considering the nature of stereotypes, it is important to consider its pervasiveness in everyday life and extent to which it is “controllable.” The latter aspect is especially important given the increasing emphasis on interventions to decrease stigma. The automaticity research reviewed above points to a pervasive and generalized activation of stereotypes across different contexts and target groups. Another instructive aspect of past stereotype research is on the various factors that influence the extent to which stereotypes are activated, or inhibited (e.g., contexts, information processing style, affect). Understanding these important variables further sheds light on the process of stereotype activation and endorsement and is essential to informing on evidence-based, effective stigma reduction strategies. While past research in social psychology has largely focused on racial/ethnic, gender, and age stereotypes, the results of studies looking at these different stereotypes did not differ significantly just by virtue of the type
of stereotypes. That is, the mechanisms and interplay of variables appear similar. Therefore, if we were to apply the results of these findings to stereotypes of mental illness, it is hypothesized that similar results would be found.

Relating back to the research on racial stereotypes and dangerousness, if one were to extend this line of research to the field of mental health stigma, similarities in findings seem likely to be expected. From the survey results on the public’s conceptions and beliefs about persons with mental illness, there seem to be a general consensus that people with mental illness are more likely than the average person to engage in unpredictable and dangerous behaviors (Angemeyer & Dietrich, 2006; Link et al., 1999; Pescosolido et al., 2010). If the average lay person subscribes to this belief, it is conceivable that mental illness will be automatically implicated in situations where there is no clear antecedent about a bizarre or violent behavior. Additionally, in cases where the idea of danger is already present or primed, it may lead to an unfair heightened attention towards persons with mental illness akin to the Donders et al. (2008) study which suggested that race could be learned as a fear stimulus.

The apparent consistency of public conceptualizations of mental illness (i.e., generally negative) has led researchers to consider the different avenues in which information on mental illness is being disseminated to the public and how that influences public opinion and understanding. One area of interest and contention has been the media’s portrayal of persons with mental illness and its role in shaping public conceptions of mental illness (Wahl, 1992, 2003). Research on media depiction has largely taken two routes: descriptive content analysis and more experimental approaches to the impact of the explicitly negative media content. As reviewed above, the general trend suggests that mental illness is typically portrayed negatively (i.e., incompetent, dangerous, violent, uncontrollable) and that these portrayals significantly
affect consumers of the media content in endorsing and believing these negative stereotypes. The one aspect that is currently missing from this research area is how a consumer receives this information and the mechanisms underlying the influence. The use of media as a context to understand stereotype activation and application is also particularly interesting as there is often times no direct, explicit instruction of the inference. That is, the media's depiction of a character does not typically explicitly tell the audience what the intended characteristic or attributes of the character is. Rather, they present a set of behavioral pattern, within a specific context, and it is left to the audience to interpret the presented material.

The current review thus attempted to bridge the two important and rich fields of cognitive processes in comprehension and stereotypes with mental health stigma. The goal was to allow the field to better understand the mechanism by which people come to endorse stigma towards persons with mental illness, based largely on stereotype activation and application, in the context of media depictions of mental illness. The media holds a unique position whereby it provides information in a mostly one-sided manner which disallows the provider to offer further clarification for the receiver, should the latter experience any difficulties in understanding the material. In their content analysis of Australian news article coverage over two years, Kesic, Ducat, and Thomas (2012) found that the media only infrequently directly described persons with mental illness as violent or aggressive. Rather, the authors noted that this relationship was usually implied by the articles through sensationalizing the stories and adding in the existence of mental illness in conjunction with the aggressive behaviors. Considering the manner in which information is being disseminated through the media, the ambiguous context indicates a higher probability of pragmatic inference on the public part which is largely dependent on the receiver's existing knowledge (and stereotypes) and the context in which the information is received.
Given the amount of information that one is exposed to in this era, there is also added utility in considering how someone negotiates information received and organize and store it. Studies specifically testing the effects of media portrayals (both in print and film) have demonstrated a significant influence on attitudes (Corrigan et al., 2013; McGinty et al., 2013; Penn et al., 2003). These findings hint at a direct influence of media information but have yet articulated a mechanism by which the audience is processing that information. The question remains as to how the general public consumes, organizes, and remembers information it receives from the media. Effective recommendations and interventions can be more effectively designed and implemented when there is a better understanding of the mechanisms underpinning this phenomenon.
Chapter 10: Overview of Studies

Objectives

As mentioned, the main goal of the studies is to bridge the two important and rich fields of cognitive processes in comprehension and stereotype activation with mental health stigma. By considering this stigma from this perspective, it would advance the field’s understanding of the mechanism underlying stigma endorsement. The current study also aimed to take a more ecological look at how people navigate social information and its related processes including the retention and recall of presented material.

The present studies used an experimental paradigm to investigate the process of reading comprehension and subsequent memory of information in an audience exposed to a news article on a violent incident. The goals include: first, to investigate the mechanism underlying reading comprehension for a news article; second, to examine if stereotypical beliefs regarding mental illness impact on the content of the inference drawn via an automatic activation process; and lastly, to examine the potential impact of mood on information processing.

Variables of Interest

To examine if lay people reading news engage in pragmatic inference, participants will be shown a news article on a violent incident which is ambiguous regarding the antecedent of the incident. The use of an ambiguous stimulus as a contextual ground follows past studies which have operationalized and measured pragmatic inference by use of memory measures of vague target stimuli (e.g. Brewer, 1978; Harris & Monaco, 1978; Johnson et al., 1973; McKoon & Ratcliff, 1982). For the current studies, a real-life news article will be adapted for use as a stimulus in the experiments. The news article will be modified accordingly so as to be sufficiently ambiguous with regards to the cause of the incident. Two separate studies will then
be conducted to examine the potential impact of priming for mental illness only, and with possible interaction with mood (i.e., positive versus negative) induction.

The first study will investigate the effect of priming for the mental illness concept in the context of a violent news article which is ambiguous in terms of the incident’s antecedent. To prime for mental illness stereotype, the news article in the experimental condition will state that the suspect had a history of mental illness. McKoon and Ratcliff's (1992) minimalist position argues that, in the absence of an explicit and specific goal, people tend to rely on a priori knowledge and beliefs and/or explicit information presented when they read. The lack of a goal here refers to having no stated objective when one processes the information, that is, the person is not asked to evaluate the target individual for a role (e.g., job) or on any trait (e.g., intelligence or friendliness). In the absence of a goal then, people are more likely to rely on their pre-existing beliefs about mental illness and its associated stereotypes (e.g., dangerousness), especially when there is no contrary explicit information refuting that (e.g., self-defense).

Subsequently, the degree of stereotypical beliefs and attitudes will be measured by asking participants about their general impressions of the protagonist in the article, possible antecedent of the incident, and tested on their memory of information from the article. The responses will be used as the outcome measure of stereotype activation and application. A one week follow-up repeated measures of the same delayed recall and recognition memory measures will also be conducted. The aim of the one week interval to measure participants' memory of the article will be used as an exploratory tool to approximate media propagation of mental illness stigma. Harris and Monaco (1978) argued that following pragmatic inference of presented information, receivers typically are unable to distinguish between the actual information that was presented and their own interpretation of it. Hence, receivers often tend to attribute their interpretation as
the actual presented information (Harris & Monaco, 1978; McDermott & Chan, 2006). This one week delayed recall is thus an examination of how participants remember the presented information in an ecological manner.

The second study aims to investigate the potential effects of mood on information processing and resulting memory. Past studies have generally found a relationship between positive mood (i.e., happy) and increased use of shallow heuristic-type processing (e.g., Bodenhausen et al., 1994a) while negative moods (i.e., sad) have been linked to more controlled and deeper level of processing (e.g., Gasper & Clore, 2002). When considering the nature of mental illness stereotypes, it leans overwhelmingly towards the negative end of the spectrum given the typically unfavorable stereotypes associated (e.g., unpredictable, dangerous, and incompetent) (Link, Phelan, Bresnahan, Stueve, & Pescosolido, 1999; Pescosolido et al., 2010). Therefore, it is expected that news on crime involving the topic of mental health, is likely to evoke a negative affect. This represents an interesting first step in examining the role of emotions on the reader’s comprehension processes in an ambiguous context.
Chapter 11: Study 1 Method

Aim

The purpose of Study 1 is to examine the potential impact of priming for mental illness in an ambiguous situation. Participants were presented with a news article of a violent incident, taken from the New York Times, where the presence or absence of a mental illness history is manipulated. Subsequent memory and impressions of the perpetrator in the target news article were measured.

The first hypothesis of this study hypothesize that participants in the condition where mental illness context is primed will be significantly more likely to report the antecedent of the violent incident to mental illness in the immediate recall question, relative to the control condition (H1). All participants would exhibit comparable memory for unambiguous information mentioned in the target article, but participants primed with mental illness will endorse significantly more false positives for items that were pragmatically implied and that is plausible (i.e., consistent with mental illness stereotypes) (H2). Participants high in need for closure and/or need for cognition will also remember more accurate information about the article, that is, that there was no clear antecedent for the incident mentioned in the article and engage less in pragmatic inference (H3). Participants who reported greater stigmatizing attitudes towards persons with mental illness will exhibit greater pragmatic inference in the mental illness stereotype prime condition (H4). Lastly, participants will exhibit a greater extent of pragmatic inference and mental illness stereotype activation after a week, as measured from the recall and recognition memory measures (H5).
Method

Design and manipulation. Study 1 was a between-subjects experimental design involving two conditions: presence (experimental group) and absence (control group) of the mental illness stereotype prime. The experimental vignette in the study was adapted from an actual news report from the New York Times. In the experimental group, the news article included the following sentence “Mr. John Doe (the suspect) has a history of schizophrenia” while this information was absent in the control group. The news article presented to the two groups was otherwise identical. The study included two discrete sessions, a week apart, in testing for participants’ memory of the article. The first session contained the bulk of the measures (self-report cognitive style and attitudinal measures and memory for read information) while the follow-up session assessed the participants’ memory for the article they had read a week earlier.

While the recall measures assess the process of memory retrieval (and biases that affects memory at that stage), recognition measures provides an insight into the encoding process (Harris, 1977; Johnson et al., 1973; McKoon & Ratcliff, 1992). Given the study’s interest in examining pragmatic inference at the time of reading (i.e., encoding), the recognition measure provides a measure of the pragmatic inference hypothesis.

Procedure. The survey was fully administered through an online survey hosting site. Participants were told that the survey was a general multi-faceted survey about media and attitudes. After informed consent, participants were randomly assigned into the experimental or control group based on the embedded random assignment tool on the survey hosting site (www.qualtrics.com).
For the first session (Part 1), all participants were instructed to read the presented material (see Appendix A) carefully and that they will be asked questions after. The ambiguity of the target news article was previously examined with volunteers who were naïve to the study’s aims and hypotheses. Immediately after reading the target news article, participants were directed to the short, free response and likert-scale questions on a separate screen with no option to go back to previous pages. The immediate recall memory measures in this section included questions on a brief summary of the article, their impression of the suspect as portrayed in the vignette, and what the participant thought was the cause of the incident. Next, participants were directed to a filler-task where they read a vignette about the European economy (see Appendix B) and asked questions after. The purpose of the filler task was to provide a short period of time for information retention of the targeted vignette and to mask the study’s focus on mental illness. Additionally, the neutral news article was of a different theme from the target violent incident news article and was not expected to significantly impact on the memory of the first article.

Thereafter, participants were given a recognition test (see Appendix C) about the target (first) news article. Instructions for this section were as follow:

*Remember the first article you read earlier about an incident involving the police? On the following page, there are 20 statements about the article. Please read each one carefully and indicate whether you remember the specified information from the first article you read. If you think the statement contains correct information from the news article, click on the YES button; if you think that the statement is not accurate based on what you read from the article, click on the NO button. Please give a yes or no answer for each sentence, even if you feel you have to guess. You don’t have to spend too much time on each statement, just give it your best guess and move on to the next statement.*
Lastly, as a manipulation check, the participants were asked to indicate if they noticed the mention of mental illness history on a later, separate screen.

The final part of the survey included self-report questionnaires and demographic information. Participants were asked to complete several questionnaires on attitudes towards mental illness, existing experience with mental illness, information processing styles that may impact on proneness to stereotype and pragmatic inference (i.e., need for closure and need for cognition), social desirability, and demographic information. Lastly, participants were thanked and reminded about the follow-up part of the study a week later where they will be sent an email link as a follow-up. In the second part of the study, participants were contacted for the same questions about the article and the recall and recognition measure described above after a week. Participants were fully debriefed following the second session.

**Materials**

**Memory for article.** For both the immediate and delayed recall portions, participants were asked to give a brief summary of the article, their impressions of the perpetrator, what they thought was the antecedent of the incident, ratings of dangerousness of the perpetrator, and suggested preventive measures (refer to Appendix C for the full list of questions).

The recognition part of the memory task (see Appendix C) was based on Johnson and colleagues’ (1973) design of which consisted of statements that were *old* (used in the article), *unrelated* (including features from the original article but is inconsistent with the presented information), and *inference* (pragmatically implied by the article). For the inference-type questions, there are two main themes for comparison here: general and pragmatic inference. General inference statements contain items that may be inferred from the provided information but are not theorized to be influenced by mental illness stereotypes, for example, “The suspect
was unemployed” and “The assailant used a weapon during the attack.” Pragmatic inference statements include inferences made that are impacted by stereotype priming, for example, ”The suspect’s mental illness caused the attack” and “The police felt that the suspect was unpredictable.”

**Attitudes about Mental Illness and its Treatment Scale (AMIS; Kobau et al., 2010).**

This 11-item self-report questionnaire, validated in a large US population-based study, was designed to assess for stigmatizing attitudes towards people with mental illness among the public. Factor analyses results have indicated two subscales: Negative Stereotypes (α = .66) and Recovery and Outcomes (α = .69) (Kobau et al., 2010). The measure was used as a proxy for determining existing stereotypical beliefs in the participants. In particular, greater endorsement of the Negative Stereotypes scale is theoretically thought to positively correlate with more stigmatizing beliefs reflected in participants’ recall of the vignette. Some of the items include negative statements such as “I believe a person with mental illness is a danger to others” and “I believe a person with mental illness is unpredictable,” and also positive statements such as “I believe a person with mental illness can eventually recover.” Items are on a Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). For the current sample, Cronbach’s alpha for the full scale was .56 for the 11-item scale; .73 for the 7-item scale; .78 for the 3-item negative stereotypes subscale; and .69 for the 4-item recovery subscale.

**Marlowe-Crowne Social Desirability Scale (M-C SDS; Crowne & Marlowe, 1960).** The 11-item short form version of the Marlowe-Crowne Social Desirability Scale is a widely used instrument designed to measure respondents' tendencies to respond in a culturally-sanctioned, politically correct manner. The items included are deemed to be highly implausible cultural ideals. Endorsement of these improbable items is seen to be indicative of positive impression
management (Crowne & Marlowe, 1960) and will be used as a covariate in analysing responses, to probe for any possible moderating influence of social desirability. That is, less stigmatizing attitudes reported with higher social desirability endorsed. The original scale’s internal consistency, Kuder-Richardson formula 20 = .88, indicated homogeneity among its items (Crowne & Marlowe, 1960). For the current sample, Cronbach’s alpha was .73 for the full scale.

*Need for cognition (NFC; Cacciopo, Petty, & Chuan, 1984).* The need for cognition scale is an 18-item self-reported questionnaire that taps on an individual’s preference and enjoyment for thinking (Cacciopo et al., 1984). Previous research has suggested that the need for cognition is one individual-level variable that may impact on stereotype activation and endorsement such that people scoring higher on need for cognition are associated with lower rates of stereotype endorsement, and vice versa (Florack, Scarabis, & Bless, 2001). It is hypothesized that need for cognition will moderate the relationship of pragmatic inference/mental illness on reported stigmatizing beliefs about mental illness. That is, individuals with higher need for cognition will report less stigmatizing beliefs about persons with mental illness. Items are on a likert-scale from 1 (*extremely uncharacteristic of you*) to 5 (*extremely characteristic of you*). Some of the items are as follows: “I really enjoy a task that involved coming up with new solutions to problems”, “The notion of thinking abstractly is appealing to me,” and “It’s enough for me that something gets the job done; I don’t care how or why it works” (*reverse scored*). The internal consistency of the scale is high; Cronbach’s alpha = .9 (Cacciopo et al., 1984).

*Need for closure scale (NFCS; Webster & Kruglanski, 1994).* The NFCS consists of 42 items and was designed to measure 5 different facets of a latent construct, *need for closure*. The construct was described as an inclination towards structure, consistency, inflexibility in thinking,
prone to jumping to conclusions, and dislike for ambiguity (Webster & Kruglanski, 1994). For
the present study, participants who score high on need for closure are hypothesized to be more
likely to report more stereotypical (and more stigmatizing) beliefs towards persons with mental
illness and engage more significantly in the use of pragmatic inference. Some examples of items
on the measure are “I feel uncomfortable when I don’t understand why an event occurred in my
life,” “I’d rather know bad news than stay in a state of uncertainty,” and “I dislike unpredictable
situations.” Items are on a 6-point Likert scale that range from 1 (strongly disagree) to 6
(strongly agree). The overall scale consistency was high in the current sample (Cronbach’s
alpha = .92).

*Reported and intended behaviour scale (RIBS; Evans-Lacko et al., 2011).* The RIBS
was designed to measure one’s past, current, and future discriminatory behaviors towards
persons with mental illness. Specifically, it asks respondents how willing they are to live with,
work with, live near, and maintain a relationship with a person with mental illness (Evans-Lacko et al.,
2011). For the future-oriented questions, the responses scale range from agree strongly to
disagree strongly and it includes an option for don’t know. The overall alpha in the present study
was high, Cronbach’s alpha = .88.

*Manipulation check.* As described earlier, all participants were asked if they
remembered seeing the verbatim sentence (“(Name of suspect) has a history of schizophrenia”) after the recognition measures, and on a separate screen. To pass the manipulation check
question, participants have to choose the correct response (i.e., “Yes” for the experimental
condition) on a forced-choice question.

*Participants.* One hundred community members from an online survey recruitment site,
Amazon MTurk, and 122 college students from an urban university in a large U.S. city
participated in the study. The college students were compensated for their time with the appropriate amount of credit for their class while the MTurk participants were compensated for USD 2 for an estimated time of about 45 minutes for the first session and another USD 1 for part 2 of the study. Responses from 4 community members and 15 college students were excluded from the final analyses due to failed responses to simple attention-check questions that were embedded in the online survey. Additionally, 2 community members and 9 college student respondents did not complete the survey and were subsequently removed from the final analyses. Of note, 7 community members and 13 college students failed the manipulation check. The final sample comprised of 172 participants (87 community members and 85 college students). Participants were randomly assigned into the experimental and control condition, resulting in 91 participants in the control condition and 81 participants in the experimental condition.
Table 1

Study 1 Participants’ Demographics

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total (N=170-172)</th>
<th>Community (N=86-87)</th>
<th>College (N=84-85)</th>
<th>Experimental (N=81)</th>
<th>Control (N=91)</th>
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<tr>
<td>Age</td>
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<td>35.2 (10.5)**</td>
<td>20.5 (3.72)**</td>
<td>26.9 (9.41)</td>
<td>29.0 (11.9)</td>
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<td>Gender (% of females)</td>
<td>66%</td>
<td>56% *</td>
<td>75% *</td>
<td>51%</td>
<td>49%</td>
</tr>
<tr>
<td>Race/ethnicity</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White/ European</td>
<td>46%</td>
<td>79%</td>
<td>13%</td>
<td>44%</td>
<td>49%</td>
</tr>
<tr>
<td>Hispanic/ Latino(a)</td>
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<td>4%</td>
<td>55%</td>
<td>28%</td>
<td>30%</td>
</tr>
<tr>
<td>Black/ African</td>
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<td>5%</td>
<td>16%</td>
<td>14%</td>
<td>7%</td>
</tr>
<tr>
<td>Asian/ Pacific</td>
<td>6%</td>
<td>9%</td>
<td>4%</td>
<td>6%</td>
<td>7%</td>
</tr>
<tr>
<td>Others</td>
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<td>3%</td>
<td>12%</td>
<td>8%</td>
<td>7%</td>
</tr>
<tr>
<td>Education</td>
<td>5.99 (1.72)</td>
<td>6.76 (1.8)**</td>
<td>5.20 (1.19)**</td>
<td>5.84 (1.68)</td>
<td>6.12 (1.75)</td>
</tr>
<tr>
<td>Mental illness diagnosis (self)</td>
<td>13%</td>
<td>21% *</td>
<td>5%*</td>
<td>13%</td>
<td>13%</td>
</tr>
<tr>
<td>Received mental health treatment</td>
<td>15%</td>
<td>22% *</td>
<td>7% *</td>
<td>15%</td>
<td>14%</td>
</tr>
<tr>
<td>Family member with diagnosis</td>
<td>32%</td>
<td>35%</td>
<td>29%</td>
<td>37%</td>
<td>28%</td>
</tr>
<tr>
<td>Close friend with diagnosis</td>
<td>28%</td>
<td>33%</td>
<td>22%</td>
<td>23%</td>
<td>33%</td>
</tr>
</tbody>
</table>

*p =< .01    ** p =< .001

Note. Race/ethnicity: others include Arab/ Middle Eastern, bi/multi-racial, and other self-reported minorities; Education: 0=no schooling completed, 3=high school graduate, 6=associate degree, 7=BA/BS, 10=PhD.

As seen from Table 1, the mean age for the overall sample was 28.0 years (SD = 10.8) and ranged from 18 to 68 years. Predictably, the community sample was significantly older than the college sample, t(108) = 12.3, p < .001. The mean age for the community sample was 35.2 years (SD = 10.5) while the mean age for the college sample was 20.5 years (SD = 3.72). The overall sample included more females (N = 113) than males (N = 59) which was largely due to the majority female participants in the college sample (i.e., 75.3 %). There were more females in the college sample than the community sample, χ²(1, N=172) = 6.87, p = .01. No differences were found between the experimental and control condition for age and gender.
Close to half of all participants reported their race/ethnicity to be White (refer to Table 1). About 29% reported Hispanic/Latino(a), 10% Black/African American, and 6% Asian/Pacific Islander. The community sample consisted of mostly White participants (79%) whereas the college sample included more heterogeneity (slightly more than half reported their race/ethnicity to be Hispanic/Latino(a), 13% White, and 16% Black/African American). There were about twice as many African Americans in the experimental condition (14%) compared to the control condition (7%); no differences were found for the other races (see Table 1) between these two conditions.

Level of education attained was variable in the community sample with 15% reporting high school diploma/GED, 20% attained trade school or vocational training, 10% reporting a bachelor’s degree, 36% reporting a master’s degree and 14% reporting attaining a professional degree. The college sample consisted of current undergraduates with a comparable split of sophomore (36%), junior (32%), and senior/BA/MA (32%). There were no differences in the level of education reported between the experimental and control condition.

As per Table 1, 13% of all participants reported having a mental illness diagnosis and 15% reported receiving some type of mental health treatment. Of note, most participants who reported a diagnosis also indicated having received mental health treatment, \( r(171) = .93, p < .001 \) (see Table 5). 32% of all participants shared that they have a family member with a mental illness diagnosis and 28% knew a close friend with a mental illness diagnosis. There were significantly more community members than college students who endorsed a diagnosis of mental illness, \( \chi^2(1, N=171) = 9.67, p = .002 \). Similarly, out of those who reported receiving mental health treatment, there were more community members than college students, \( \chi^2(1, N=172) = 7.56, p = .009 \). No differences were found between community members and college
students for family members with a mental illness diagnosis and close friends with diagnosis. There were also no significant differences between the experimental and control condition in reported contact with mental illness (self, receiving mental health treatment, and family members and close friends with diagnosis).
Chapter 12: Study 1 Results

Immediately after reading the article, participants were asked a number of immediate recall, open-ended questions about the article including giving a brief summary of the article in a couple of sentences, impressions of the suspect, and what they thought was the cause of attack. Two research assistants, who were blind to the design and hypotheses of the study, were trained in coding of the free recall measures. Inter-rater reliability was conducted on a random sample of 20% of the responses: \( r(34) = 1, p < .001 \), for summary of article and cause of incident; \( r(34) = .81, p < .001 \). The same two research assistants completed coding for all the responses in Study 1 and 2.

Performance on the memory measures are listed below in Table 2. The first hypothesis for part 1 of Study 1 was that participants in the experimental condition will be significantly more likely to attribute the antecedent of the violent incident to mental illness, relative to the control condition.

Table 2.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total</th>
<th>Experimental</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Free recall memory</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Part 1: Suspect had mental illness</td>
<td>.25 (.43)</td>
<td>.49 (.50)</td>
<td>.03 (.18)</td>
</tr>
<tr>
<td>Part 1: Mention of mental illness</td>
<td>.20 (.39)</td>
<td>.42 (.50)</td>
<td>.00 (.00)</td>
</tr>
<tr>
<td>Part 1: Mental illness as cause</td>
<td>.21 (.41)</td>
<td>.43 (.50)</td>
<td>.02 (.15)</td>
</tr>
<tr>
<td>Part 2: Suspect had mental illness</td>
<td>.34 (.48)</td>
<td>.66 (.48)</td>
<td>.05 (.23)</td>
</tr>
<tr>
<td>Part 2: Mention of mental illness</td>
<td>.22 (.42)</td>
<td>.45 (.50)</td>
<td>.02 (.13)</td>
</tr>
<tr>
<td>Part 2: Mental illness as cause</td>
<td>.32 (.47)</td>
<td>.59 (.50)</td>
<td>.09 (.29)</td>
</tr>
<tr>
<td><strong>Recognition memory</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Part 1: Old</td>
<td>1.84 (.14)</td>
<td>1.85 (.14)</td>
<td>1.84 (.14)</td>
</tr>
<tr>
<td>Part 1: Unrelated</td>
<td>1.95 (.11)</td>
<td>1.94 (.10)</td>
<td>1.95 (.12)</td>
</tr>
<tr>
<td>Part 1: General inference</td>
<td>1.54 (.25)</td>
<td>1.50 (.23)</td>
<td>1.58 (.26)</td>
</tr>
<tr>
<td>Part 1: Pragmatic inference</td>
<td>1.76 (.22)</td>
<td>1.67 (.23)**</td>
<td>1.83 (.19)**</td>
</tr>
<tr>
<td>Part 2: Old</td>
<td>1.80 (.16)*</td>
<td>1.82 (.16)</td>
<td>1.78 (.17)</td>
</tr>
<tr>
<td>Part 2: Unrelated</td>
<td>1.88 (.15)**</td>
<td>1.88 (.17)</td>
<td>1.89 (.13)</td>
</tr>
<tr>
<td>Part 2: General inference</td>
<td>1.37 (.24)**</td>
<td>1.37 (.25)</td>
<td>1.38 (.24)</td>
</tr>
<tr>
<td>Part 2: Pragmatic inference</td>
<td>1.52 (.29)**</td>
<td>1.37 (.26)**</td>
<td>1.64 (.26)**</td>
</tr>
</tbody>
</table>

\*p < .05, \**p < .001

Note. Free recall memory: 0=no mention, 1=mentioned. Manipulation check: 0=failed, 1=passed. Recognition measures: the lower the score, the greater the amount of errors or inference endorsed. \( N \) (Part 1) = 169-172; \( N \) (Part 2) = 106-110
<table>
<thead>
<tr>
<th></th>
<th>Experimental</th>
<th>Control</th>
<th>$\chi^2$</th>
<th>Cohen’s $d$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Part 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suspect had mental illness</td>
<td>Yes</td>
<td>39 (49%)</td>
<td>3 (3%)</td>
<td>47.7 **</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>40 (51%)</td>
<td>87 (97%)</td>
<td></td>
</tr>
<tr>
<td>Mention of mental illness</td>
<td>Yes</td>
<td>33 (42%)</td>
<td>0 (0%)</td>
<td>46.7 **</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>46 (58%)</td>
<td>90 (100%)</td>
<td></td>
</tr>
<tr>
<td>Mental illness as cause</td>
<td>Yes</td>
<td>34 (43%)</td>
<td>2 (2%)</td>
<td>41.8 **</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>45 (57%)</td>
<td>88 (98%)</td>
<td></td>
</tr>
<tr>
<td><strong>Part 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suspect had mental illness</td>
<td>Yes</td>
<td>33 (64%)</td>
<td>3 (5%)</td>
<td>44.6 **</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>19 (36%)</td>
<td>55 (95%)</td>
<td></td>
</tr>
<tr>
<td>Mention of mental illness</td>
<td>Yes</td>
<td>22 (45%)</td>
<td>1 (2%)</td>
<td>28.4 **</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>27 (55%)</td>
<td>55 (98%)</td>
<td></td>
</tr>
<tr>
<td>Mental illness as cause</td>
<td>Yes</td>
<td>29 (59%)</td>
<td>5 (9%)</td>
<td>30.1 **</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>20 (41%)</td>
<td>51 (91%)</td>
<td></td>
</tr>
</tbody>
</table>

** p < .001
Note. N(Part 1) = 169; N (Part 2) = 105

As seen from Table 3, about 43% of the participants in the experimental condition reported the cause of the incident as issues relating to mental illness whereas only 2% of participants in the control condition reported this as the cause. The proportion of participants who mentioned mental illness as a cause differed by condition, $\chi^2(1, N=169) = 41.8, p < .001$, Cohen’s $d = 1.15$. Some responses include “I believe that maybe the attacker might have been going through schizophrenia since he did suffer from it at that moment which caused him to take it out on the old man,” “Mr Brown being in the wrong place at the wrong time and Mr Doe...
being a mentally ill man roaming the streets unsupervised.” “I believe his schizophrenia caused the attack. I don't believe that the attack was provoked or intentional,” and “Delusions stemming from schizophrenia appear to have caused this attack.”

In the short summary, any mention of mental health history (e.g., “mental illness”, “mental disabilities”, and “schizophrenia”) was coded as present. Some examples are “Mr. Doe kills Mr. Brown because he has Schizophrenia;” “Mr. Brown was attacked and hurt to the point in which he died. Doe was then arrested and Doe lived around the area in which the crime happened, he also has schizophrenia;” “In the article, Mr. Doe, a schizophrenic, has beaten an old man, Mr. Brown, to death.” About 42% of participants in the experimental condition mentioned the presence of mental illness in their brief recount compared to none (out of 96) of the participants in the control condition (see Table 3). A significant difference in responses mentioning mental illness between the control and experimental conditions was found, χ²(1, N=169) = 46.7, p < .001, d = 1.26. A moderate positive correlation is also found for mention of mental health history in the respondent’s brief summary and attribution of mental illness as a causal factor, r(168) = .44, p < .001. This suggests that participants who recalled the mental health history piece of information also tended to report mental illness having a role in causing the violent incident.

When asked about their impressions of the suspect, half of the participants in the experimental condition mentioned mental illness in their brief conceptualization while only 3 of 90 participants in the control condition brought up mental illness (see Table 3). A significant difference was found between the conditions, χ²(1, N=169) = 47.7, p < .001, d = 1.25. Some examples include “A psychotic person who might have some type of mental disorder and who is not being treated. A person who is extremely violent and who should not be out in public unless
he is being treated;” “I think that he is psychologically ill and he further be dangerous to the society,” and “Mr John Doe, has suffers from schizophrenia and therefore he suffers from a mental disease which prohibits his ability in making correct judgements due to the decreased size of the frontal lobe, which could explain the randomness of his attack if he did in fact commit the crime.”

Across all three recall open-ended questions, mental illness was overwhelmingly reported by participants in the experimental condition, suggesting that the report of mental illness was a salient piece of information, compared to the other information in the article, to readers and remembered, at least immediately after reading the article. When asked about the vignette and to speculate about the cause, about 40% to 50% of participants in the experimental condition brought up mental illness (Table 3).

Besides the recall memory measures which reflect the retrieval process, recognition memory, tapping on the encoding process during exposure to the stimulus, was also tested. An independent samples t-test was conducted to examine differences on the recognition memory performance between the control and experimental group. As hypothesized, all participants would exhibit comparable memory for unambiguous information mentioned in the target article, but participants in the experimental condition will endorse significantly more false positives for items that were pragmatically implied and that is plausible (i.e., consistent with mental illness stereotypes). The unambiguous information consisted of three different types of information: old, verbatim items taken from the article; unrelated, items that did not appear in the original article and are erroneous; and general inference, items that can plausibly be inferred but are not theoretically influenced by mental illness prime. As seen from Table 2, the only significant difference between the groups was for the pragmatic inference items, \( t(166) = 5.04, p < .001, \)
Cohen’s $d = .78$. Mean endorsement of mental illness stereotypes item, evident of pragmatic inference, was 1.64 ($SD = .26$) for the control group and 1.37 ($SD = .26$) for the experimental group. Lower score indicates greater extent of pragmatic inference.
### Table 4.

**Study 1 Descriptives for Attitudinal Measures**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total (N=169-172)</th>
<th>Experimental (N=80-81)</th>
<th>Control (N=89-91)</th>
<th>Community (N=75-94)</th>
<th>College (N=66-98)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitudes towards mental illness - Total</td>
<td>2.55 (.56)</td>
<td>2.61 (.52)</td>
<td>2.50 (.59)</td>
<td>2.58 (.60)</td>
<td>2.52 (.52)</td>
</tr>
<tr>
<td>Negative stereotypes</td>
<td>3.22 (.83)</td>
<td>3.27 (.75)</td>
<td>3.18 (.91)</td>
<td>3.28 (.90)</td>
<td>3.16 (.76)</td>
</tr>
<tr>
<td>Recovery</td>
<td>3.96 (.58)</td>
<td>3.89 (.59)</td>
<td>4.02 (.58)</td>
<td>3.95 (.56)</td>
<td>3.97 (.61)</td>
</tr>
<tr>
<td>Reported and intended behavior scale</td>
<td>3.47 (.80)</td>
<td>3.46 (.80)</td>
<td>3.48 (.80)</td>
<td>3.42 (.90)</td>
<td>3.52 (.68)</td>
</tr>
<tr>
<td>Need for cognition</td>
<td>3.40 (.71)</td>
<td>3.31 (.71)</td>
<td>3.49 (.71)</td>
<td>3.45 (.84)</td>
<td>3.36 (.56)</td>
</tr>
<tr>
<td>Need for closure – Total</td>
<td>3.57 (.46)</td>
<td>3.58 (.39)</td>
<td>3.55 (.51)</td>
<td>3.56 (.54)</td>
<td>3.57 (.36)</td>
</tr>
<tr>
<td>Closemindedness</td>
<td>2.46 (.54)</td>
<td>2.50 (.54)</td>
<td>2.43 (.54)</td>
<td>2.57 (.56) **</td>
<td>2.33 (.48) **</td>
</tr>
<tr>
<td>Order</td>
<td>4.03 (.75)</td>
<td>4.02 (.64)</td>
<td>4.05 (.83)</td>
<td>3.91 (.84) *</td>
<td>4.18 (.63) *</td>
</tr>
<tr>
<td>Predictability</td>
<td>3.72 (.77)</td>
<td>3.78 (.77)</td>
<td>3.69 (.78)</td>
<td>3.83 (.86)</td>
<td>3.63 (.65)</td>
</tr>
<tr>
<td>Decisiveness</td>
<td>3.20 (.82)</td>
<td>3.17 (.76)</td>
<td>3.19 (.87)</td>
<td>3.28 (.84)</td>
<td>3.07 (.79)</td>
</tr>
<tr>
<td>Ambiguity</td>
<td>4.09 (.67)</td>
<td>4.07 (.71)</td>
<td>4.13 (.63)</td>
<td>4.03 (.73)</td>
<td>4.17 (.60)</td>
</tr>
<tr>
<td>Social desirability scale</td>
<td>1.53 (.25)</td>
<td>1.51 (.27)</td>
<td>1.54 (.23)</td>
<td>1.48 (.26) **</td>
<td>1.58 (.23) **</td>
</tr>
<tr>
<td>Manipulation check (failed)</td>
<td>N=20</td>
<td>N=14</td>
<td>N=6</td>
<td>N=7</td>
<td>N=13</td>
</tr>
</tbody>
</table>

*p < .05, **p < .01

Note. Attitudes towards mental illness: 1=strongly disagree, 5=strongly agree (the higher the more stigmatizing); Reported and intended behavior scale: 1=agree strongly, 5=disagree strongly (the higher the score, the less stigmatizing); Need for closure: 1=strongly disagree, 6=strongly agree (the higher the score, the greater the need); Need for cognition: 1=extremely uncharacteristic, 5=extremely characteristic (the higher score, the greater need for cognition); Social desirability scale: the higher the score, the more socially desirable the participant scored.
Table 5.

*Study 1 Correlation matrix among proposed dependent and control variables (N = 163-171)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Part 1: Suspect had mental illness</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Part 1: Mention of mental health history</td>
<td>.44**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Part 1: Mental illness as cause</td>
<td>.54**</td>
<td>.44*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Mental illness diagnosis (self)</td>
<td>-.16</td>
<td>-.10</td>
<td>-.066</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Received treatment (self)</td>
<td>-.20</td>
<td>-.11</td>
<td>-.005</td>
<td>.93**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Family member with diagnosis</td>
<td>-.21*</td>
<td>-.11</td>
<td>-.040</td>
<td>.33**</td>
<td>.35**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Close friend with diagnosis</td>
<td>-.22*</td>
<td>-.16</td>
<td>-.057</td>
<td>.23</td>
<td>.22**</td>
<td>.44**</td>
<td>1</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>8. Part 1: Recognition – Old</td>
<td>-.013</td>
<td>.086</td>
<td>-.035</td>
<td>-.037</td>
<td>-.071</td>
<td>-.055</td>
<td>.043</td>
<td>1</td>
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<td></td>
</tr>
<tr>
<td>9. Part 1: Recognition – Unrelated</td>
<td>.037</td>
<td>.089</td>
<td>.017</td>
<td>-.061</td>
<td>-.057</td>
<td>.030</td>
<td>-.050</td>
<td>.050</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>10. Part 1: Recognition – General inference</td>
<td>-.014</td>
<td>-.031</td>
<td>-.018</td>
<td>.041</td>
<td>.037</td>
<td>.024</td>
<td>.15</td>
<td>.00</td>
<td>.14</td>
<td>1</td>
</tr>
<tr>
<td>11. Part 1: Recognition – Pragmatic Inference</td>
<td>-.16</td>
<td>-.27**</td>
<td>-.15</td>
<td>.092</td>
<td>.11</td>
<td>.15</td>
<td>.19</td>
<td>-.14</td>
<td>.32**</td>
<td>.38**</td>
</tr>
</tbody>
</table>

*p = .002; **p < .001

Note. Recognition measures: the lower the score, the greater the associated error or extent of inference.
Table 6.

**Study 1 Correlation matrix among proposed dependent and moderator variables (attitudes towards mental illness)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Part 1: Suspect had mental illness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Part 1: Mention of mental health history</td>
<td>.44**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Part 1: Mental illness as cause</td>
<td>.54**</td>
<td>.44**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Part 1: Pragmatic inference</td>
<td>-.16</td>
<td>-.27</td>
<td>-.15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Part 2: Suspect had mental illness</td>
<td>.48**</td>
<td>.42**</td>
<td>.48**</td>
<td>-.37**</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Part 2: Mention of mental health history</td>
<td>.31*</td>
<td>.34*</td>
<td>.34**</td>
<td>-.18</td>
<td>.64**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Part 2: Mental illness as cause</td>
<td>.45**</td>
<td>.30*</td>
<td>.51**</td>
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<td>.70**</td>
<td>.47**</td>
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</tr>
<tr>
<td>8. Part 2: Pragmatic inference</td>
<td>-.30*</td>
<td>-.14</td>
<td>-.26</td>
<td>.46**</td>
<td>.42**</td>
<td>-.32*</td>
<td>-.52**</td>
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<tr>
<td>9. AMIS (Total)</td>
<td>-.010</td>
<td>.036</td>
<td>-.029</td>
<td>-.013</td>
<td>.009</td>
<td>.13</td>
<td>.080</td>
<td>-.068</td>
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<tr>
<td>10. AMIS – negative stereotypes</td>
<td>-.075</td>
<td>.058</td>
<td>.074</td>
<td>-.083</td>
<td>.001</td>
<td>.057</td>
<td>.058</td>
<td>-.058</td>
<td>.82**</td>
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<tr>
<td>11. AMIS – recovery</td>
<td>-.068</td>
<td>.001</td>
<td>-.035</td>
<td>-.062</td>
<td>-.016</td>
<td>-.16</td>
<td>-.076</td>
<td>.056</td>
<td>.80**</td>
<td>.31**</td>
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<tr>
<td>12. RIBS</td>
<td>.041</td>
<td>-.029</td>
<td>.13</td>
<td>-.030</td>
<td>.071</td>
<td>.085</td>
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<td>.18</td>
<td>.54**</td>
<td>.52**</td>
<td>.35**</td>
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<td>13. Social desirability</td>
<td>-.16</td>
<td>-.022</td>
<td>.058</td>
<td>-.072</td>
<td>-.006</td>
<td>.039</td>
<td>.099</td>
<td>-.074</td>
<td>.002</td>
<td>.024</td>
<td>.024</td>
<td>.009</td>
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</table>

*p < .002; **p < .001

Note. AMIS = Attitudes towards mental illness; RIBS = Reported and Intended Behaviour Scale; N (Part 1) = 165-172, N (Part 2) = 106-109
### Table 7.

**Study 1 Correlation matrix among proposed dependent and moderator variables (cognitive styles)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Part 1: Suspect had mental illness</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>2. Part 1: Mention of mental health history</td>
<td>.44**</td>
<td>1</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Part 1: Mental illness as cause</td>
<td>.54**</td>
<td>.45**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>4. Part 1: Pragmatic inference</td>
<td>-16</td>
<td>-27*</td>
<td>-14</td>
<td>1</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5. Part 2: Suspect had mental illness</td>
<td>.48**</td>
<td>.42**</td>
<td>.48**</td>
<td>-38**</td>
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<td></td>
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</tr>
<tr>
<td>6. Part 2: Mention of mental health history</td>
<td>.31*</td>
<td>.34**</td>
<td>.40**</td>
<td>-16</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>7. Part 2: Mental illness as cause</td>
<td>.45**</td>
<td>.30*</td>
<td>.56**</td>
<td>-26</td>
<td>.70**</td>
<td>.47**</td>
<td>1</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>8. Part 2: Pragmatic inference</td>
<td>-30*</td>
<td>-14</td>
<td>-25</td>
<td>.46**</td>
<td>-42**</td>
<td>-32*</td>
<td>-52**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>9. Need for cognition</td>
<td>-0.21</td>
<td>-15</td>
<td>0.02</td>
<td>0.068</td>
<td>0.070</td>
<td>0.085</td>
<td>0.057</td>
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<tr>
<td>10. NFCS – Total</td>
<td>-0.03</td>
<td>0.031</td>
<td>0.030</td>
<td>0.14</td>
<td>0.057</td>
<td>0.006</td>
<td>0.071</td>
<td>0.064</td>
<td>-0.18*</td>
<td>1</td>
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<tr>
<td>11. NFCS – Closemindedness</td>
<td>-0.062</td>
<td>-0.004</td>
<td>-0.066</td>
<td>0.10</td>
<td>0.026</td>
<td>0.071</td>
<td>0.019</td>
<td>0.034</td>
<td>-0.39**</td>
<td>0.60**</td>
<td>1</td>
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<tr>
<td>12. NFCS – Order</td>
<td>-0.045</td>
<td>0.034</td>
<td>-0.006</td>
<td>0.11</td>
<td>-0.057</td>
<td>0.056</td>
<td>0.028</td>
<td>0.060</td>
<td>0.063</td>
<td>0.79**</td>
<td>0.26*</td>
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<tr>
<td>13. NFCS – Predictability</td>
<td>0.052</td>
<td>0.046</td>
<td>0.030</td>
<td>0.027</td>
<td>0.049</td>
<td>0.011</td>
<td>0.076</td>
<td>0.016</td>
<td>-0.21</td>
<td>0.72**</td>
<td>0.36**</td>
<td>0.45**</td>
<td>1</td>
<td></td>
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<tr>
<td>14. NFCS – Decisiveness</td>
<td>-0.14</td>
<td>-0.10</td>
<td>0.051</td>
<td>0.12</td>
<td>0.043</td>
<td>-0.028</td>
<td>0.046</td>
<td>-0.014</td>
<td>0.30**</td>
<td>0.38**</td>
<td>0.013</td>
<td>0.32**</td>
<td>0.005</td>
<td>1</td>
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<tr>
<td>15. NFCS – Ambiguity</td>
<td>0.057</td>
<td>0.085</td>
<td>0.018</td>
<td>0.081</td>
<td>-0.082</td>
<td>-0.058</td>
<td>-0.14</td>
<td>0.040</td>
<td>-0.28**</td>
<td>0.70**</td>
<td>0.46**</td>
<td>0.37**</td>
<td>0.52**</td>
<td>-0.12</td>
</tr>
</tbody>
</table>

*p < .002; **p < .001

Note. NFCS = Need for closure scale; N (Part 1) = 165-172, N (Part 2) = 108-110
**Self-report measures on cognitive styles, social attitudes, and response style**

Due to the large number of pairwise correlations analyzed, Bonferroni correction to the p-value was set at .0025.

**Social desirability scale**

On the Marlowe-Crowne Social Desirability Scale (M-C SDS; Crowne & Marlowe, 1960), college students appeared to endorse more items indicating higher social desirability ($M=1.58$, $SD=.23$) relative to community members ($M=1.48$, $SD=.26$), $t(170) = -2.68$, $p = .008$ (see Table 4). For the current sample, social desirability did not significantly correlate with any of the dependent memory measures (Table 6).

**Need for cognition scale**

As seen in Table 4, no significant difference was found between the college student sample ($M=3.36$, $SD=.56$) and community sample ($M=3.45$, $SD=.84$), $t(162) = 1.37$, $p = .17$. The mean for the overall sample was 3.40 ($SD = .71$). No significant correlations was found for one’s reported need for cognition and the dependent memory measures.

**Need for closure scale**

There were a total of 170 complete responses for the need for closure scale. As suggested by the authors, scores above 15 on the embedded “Lie” scale should be removed from further analyses, bringing the final total to 141 valid responses. The overall mean for the sample is 3.57 ($SD = .46$). Significant differences between the two samples were found for the Closemindedness and Order and Structure subscales. The community sample endorsed greater extent of close-mindedness ($M=2.57$, $SD=.56$) compared to the college sample ($M=2.33$, $SD=.48$), $t(139) = 2.64$, $p = .009$. The close-mindedness subscale measures one’s propensity to consider alternative explanations. On the order and structure subscale, college students exhibited
a greater need for order and structure in their environments ($M=4.18$, $SD=.63$) relative to community members ($M=3.91$, $SD=.84$), $t(139) = -2.16$, $p = .032$.

To examine whether need for closure moderated the effect of the experimental manipulation, participants in the experimental condition were classified as low (25th percentile and lower) and high (75th percentile and above) in overall need for closure. Chi-square analyses were run for the three recall measures, and no significant differences were found between participants who self-reported as low and high in need for closure: mention of mental health history, $\chi^2 (1, N=83) = .11$, $p = .57$; suspect had mental illness, $\chi^2 (1, N=84) = .009$, $p = .56$; and mental illness as cause, $\chi^2 (1, N=84) = .015$, $p = .55$. For the pragmatic inference recognition measure, no difference was found between the low ($M=1.65$, $SD=.23$) and high ($M=1.75$, $SD=.21$) in need for closure, $t(39) = -1.37$, $p = .18$. For the individual subscales, there were no significant correlations found with any of the dependent measures (see Table 7).

Participants high in need for closure and/or need for cognition were hypothesized to engage in less pragmatic inference during the recognition measures. Bivariate correlational analyses were conducted to explore the relationship between the cognitive measures, attitudes towards mental illness, social desirability, and accuracy on the performance measures. Table 7 shows the correlations between the measures. The hypothesis that need for closure would be significantly correlated with pragmatic inference was not supported, as was the hypothesis for need for cognition. Specifically, there did not appear to be a significant relationship between one’s reported cognitive style and tendency to engage in pragmatic inference. Also, none of the subscales for the need for closure scale correlated with the recognition measures.
Attitudes towards Mental Illness Scale (AMIS)

The overall mean score for the sample was 2.55 ($SD=.56$) and no differences were found between the community and college sample, $t(170) = .65, p = .52$ (see Table 4). Similarly, there were no significant differences between the two participant groups on the two subscales (Negative Stereotypes and Recovery). As seen from Table 6, scores on the total and subscales did not significantly correlate with any of the recall and recognition memory measures.

Reported and Intended Behaviour Scale (RIBS)

As seen from Table 4, the overall mean for the scale was 3.47 ($SD=.80$). Both the community and college sample reported comparable scores, $t(170) = -.80, p = .43$, and no significant correlations were found with the dependent memory variables (see Table 6).

Overall, scores on two different attitudinal measures towards mental illness did not significantly correlate with recognition measures. Therefore, the hypothesis that participants who reported greater stigmatizing attitudes towards persons with mental illness would exhibit greater pragmatic inference in the mental illness stereotype prime condition was not supported.

Part 2

Part 2 of the study was administered about a week later via an online messaging system on the same recruitment portal. In total, 157 participants (87 community members 72 college students) out of the original 222 participants responded, giving a response rate of 71.6%. Of the 156 responses, there were 4 incomplete responses and 2 who failed the attention check. All 6 responses were from the college sample and were removed from subsequent analyses. Out of the 151 participants, 119 responses were able to be matched successfully to their responses in Part 1. The final sample consisted of 110 participants who passed the manipulation check in Part 1 and were able to be matched in Part 2.
Due to the decay effects of time interval on memory accuracy, participants were hypothesized to exhibit greater mental illness stereotype activation and greater extent of pragmatic inference after a week, as measured from the recall and recognition memory measures respectively. The former hypothesis will be tested by comparing the mention of mental illness in the open-ended recall questions asking participants what they thought was the cause between the two time periods. The latter hypothesis will be examined by comparing the extent of pragmatic inference exhibited on the recognition measures between the two time periods. It is hypothesized that memory for the old and general inference items will be worse than Part 1. The scores for the unrelated items should not differ significantly as these were information that was neither plausibly implied nor mentioned at all in the article.

Table 8.

Study 1 Paired Samples t-test Results between Part 1 and 2

<table>
<thead>
<tr>
<th></th>
<th>Time</th>
<th></th>
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<tbody>
<tr>
<td></td>
<td>Part 1</td>
<td></td>
<td></td>
<td>Part 2</td>
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<tr>
<td>Recall measures</td>
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<tr>
<td>Suspect had mental illness</td>
<td>.22 (.41)</td>
<td></td>
<td></td>
<td>.34 (.48)</td>
<td></td>
<td>-2.80*</td>
<td>101</td>
</tr>
<tr>
<td>Mention of mental illness</td>
<td>.20 (.40)</td>
<td></td>
<td></td>
<td>.22 (.41)</td>
<td></td>
<td>-.43</td>
<td>100</td>
</tr>
<tr>
<td>Mental illness as cause</td>
<td>.20 (.40)</td>
<td></td>
<td></td>
<td>.32 (.47)</td>
<td></td>
<td>-3.11*</td>
<td>101</td>
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<td>Recognition measures</td>
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<tr>
<td>Old items</td>
<td>1.84 (.14)</td>
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<td></td>
<td>1.80 (.16)</td>
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<td></td>
<td>1.88 (.15)</td>
<td></td>
<td>6.22**</td>
<td>103</td>
</tr>
<tr>
<td>General inference items</td>
<td>1.51 (.24)</td>
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<td></td>
<td>1.37 (.24)</td>
<td></td>
<td>4.80**</td>
<td>103</td>
</tr>
<tr>
<td>Pragmatic inference items</td>
<td>1.78 (.22)</td>
<td></td>
<td></td>
<td>1.52 (.29)</td>
<td></td>
<td>9.85**</td>
<td>106</td>
</tr>
</tbody>
</table>

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

Note: Recall measures: Mental illness not reported = 0, Mental illness reported = 1
Table 8 shows the results of the paired samples $t$-test between the three recall variables of interest. Of the three recall memory variables, two were statistically significant. There was increased reporting that the suspect had mental illness after the one-week delay ($M=.34, SD=.48$) relative to the exposure stage ($M=.22, SD=.41$). $t(101) = -2.80, p = .002, d = .55$. Similarly, there was greater reporting of mental illness as the cause of the incident after the delay ($M=.32, SD=.47$) when compared to the exposure stage ($M=.20, SD=.40$), $t(101) = -3.11, p = .006, d = .62$. There was no difference found for mention of mental illness in a brief summary of the article. Thus, the hypothesis that participants will tend to report greater frequency of mental illness after a time delay was partly supported.

Correlations between the measures as seen from Table 7 showed that all three recall questions remained highly correlated in Part 2 of the study. In particular, when participants remembered that the suspect had mental illness, they were also more likely to report the cause of the incident as due to mental illness, $r(105) = .70, p < .001$. Additionally, as expected, all three recall questions in Part 2 correlated significantly with responses in Part 1. That is, participants who mentioned mental illness in their responses during the first part of the study continued to report mental illness in the second part.

Results from Table 8 showed that recognition memory for all information worsened after a week. Of most interest here and consistent with expectations, the extent of pragmatic inference was significantly greater (evidenced by the lower score) a week later ($M=1.52, SD=.29$) relative to the first presentation of the article ($M=1.78, SD=.22$). $t(106) = 9.85, p < .001, d = .44$. Differences in pragmatic inference measure also had the largest effect size found amongst the recognition measures. Similarly, recognition of old items was worse one week later ($M=1.80, SD=.16$) compared to the initial exposure ($M=1.84, SD=.14$). $t(109) = 2.84, p = .005$; and there
was evidence of greater general inference made in Part 2 of the study ($M=1.37$, $SD=.24$) than Part 1 ($M=1.51$, $SD=.24$), $t(103) = 4.80, p < .001$. Contrary to expectations though, there was also a significant difference in performance on the *unrelated* items. Specifically, participants were more inaccurate in Part 2 ($M=1.88$, $SD=.15$) than Part 1 ($M=1.96$, $SD=.08$), $t(103) = 6.22, p < .001$. However, it should be noted that the effect size was negligible, Cohen’s $d = .017$. 
Chapter 13: Study 1 Discussion

Study 1 sought to investigate whether the general public tends to engage in pragmatic inference when reading vague material and the potential effect of mentioning a trigger for mental illness stereotypes. Results found significant effects for the experimental manipulation, that is, the mention of a mental illness history triggered stereotypical beliefs which appeared to impact on participants’ memory and impressions about the article. More specifically, participants in the experimental condition were over ten times more likely to remember that the protagonist has a mental illness and the mental illness contributed to the incident than those in the control group.

In addition to the immediate questions which measures retrieval processes in memory, there was evidence of pragmatic inference in a stereotype-consistent manner as seen from the recognition measures. Participants in the experimental condition (i.e., mental illness prime) were more likely to misremember pragmatically implied items compared to participants in the control group. This was also the only significant difference found between the groups among the four types of recognition memory items, which further bolster the argument for pragmatic inference.

After a week of delay, participants reported more stigma-related responses when asked about their impressions of the suspect and to speculate on the cause of the incident. Specifically, there was a greater extent of mentioning mental illness in these two delayed recall questions. However, participants reported a comparable extent of mental illness in the summary of the article one week later. Importantly, significant correlations were found such that participants who had reported mental illness either as a cause or embedded in their impressions of the suspect continued to report similar responses after the time delay. On the recognition measures, there was a general decline in accuracy across all measures. The extent of pragmatic inference was greater after the one-week delay which suggests that mental illness was indeed a salient facto
that affected the encoding process of the participants. Alternatively, it could also be due to the general trend of decay of memory over time. In either case, there is evidence of a greater extent of misremembering in a stereotypically-biased direction.

Contrary to past research examining cognitive styles and stereotypes endorsement, correlations between need for cognition and need for closure with the memory recall and recognition measures were not significant, save for a weak correlation between the need for cognition subscale and one of the three direct recall measure (i.e., mentioning mental illness in a brief summary of the presented article). This suggests that the main effect of mental illness prime in recall and recognition memory of information presented is not likely to be influenced by one’s reported need for cognition and/or need for closure.
Chapter 14: Study 2 Method

Aim

The objective of Study 2 was to extend the research on the use of pragmatic inference as an information processing style adopted by the lay public when reading a news article on a violent incident, and mood as a potential mediator of cognitive style. As discussed earlier, the emotions of interest presently are positive (i.e., happy) and negative (i.e., sad). Generally, positive mood is linked to less in-depth processing when compared to sad moods (Bodenhausen et al., 1994a; Gasper & Clore, 2002). Study 2 thus aims to examine if a similar pattern will be replicated in this ambiguous context and its potential interaction with stereotype activation and endorsement.

Hypotheses

Similar to Study 1, a significant main effect of mood was hypothesized where participants in the positive mood condition would engage in greater extent of pragmatic inference, as measured by their performance on the recognition memory measure (H1). Participants primed with mental illness would also be more likely to blame the cause of the incident on mental illness (H2). More importantly, there would be an interaction effect where participants in the mental illness—positive condition would be most likely to attribute blame to the perpetrator’s mental illness, relative to the other conditions (H3).

Design and manipulation. Study 2 employed a 2 (mood: positive/happy vs. negative/sad) x 2 (mental illness prime: present vs. absent), between-subjects factorial design. The design for the ambiguous context and mental illness prime followed Study 1. In a direct examination of the effectiveness of mood induction procedures in an online setting, Gortiz and Moser (2006) found evidence suggesting that the autobiographical recall method used in web-
based paradigms were not effective in manipulating both positive and negative mood. Further studies indicated the effectiveness and ethical use of plain texts (i.e., short stories commonly found online) as a mood induction procedure (Verheyen & Goritz, 2009). The authors recommended the use of plain texts and noted no adverse or lasting effects in a large sample of participants (Verheyen & Goritz, 2009). As the present study employed a web-based paradigm, mood manipulation followed Verheyen and Gortiz’s (2009) recommendations. For positive mood induction, funny text materials easily found online were used while the negative mood induction text was on a caregiver’s experience of taking care of a family member with Alzheimer’s disease (Verheyen & Goritz, 2009).
Table 9

Study 2 Participants’ Demographics

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total (N=86-87)</th>
<th>Experimental (N=43)</th>
<th>Control (N=44)</th>
<th>Positive Mood (N=50)</th>
<th>Negative Mood (N=37)</th>
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</thead>
<tbody>
<tr>
<td>Age</td>
<td>37.4 (12.9)</td>
<td>37.6 (12.6)</td>
<td>37.2 (13.3)</td>
<td>36.3 (13.1)</td>
<td>38.9 (12.6)</td>
</tr>
<tr>
<td>Gender (% of females)</td>
<td>56%</td>
<td>54%</td>
<td>47%</td>
<td>52%</td>
<td>62%</td>
</tr>
<tr>
<td>Race/ethnicity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White/European American</td>
<td>83%</td>
<td>86%</td>
<td>80%</td>
<td>84%</td>
<td>81%</td>
</tr>
<tr>
<td>Hispanic/Latino(a)</td>
<td>6%</td>
<td>9%</td>
<td>2%</td>
<td>8%</td>
<td>3%</td>
</tr>
<tr>
<td>Black/African American</td>
<td>6%</td>
<td>2%</td>
<td>9%</td>
<td>6%</td>
<td>5%</td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
<td>3%</td>
<td>2%</td>
<td>5%</td>
<td>2%</td>
<td>5%</td>
</tr>
<tr>
<td>Others</td>
<td>2%</td>
<td>-</td>
<td>4%</td>
<td>-</td>
<td>6%</td>
</tr>
<tr>
<td>Education</td>
<td>6.97 (1.97)</td>
<td>7.14 (2.03)</td>
<td>6.80 (1.91)</td>
<td>6.82 (1.86)</td>
<td>7.16 (2.12)</td>
</tr>
<tr>
<td>Mental illness diagnosis (self)</td>
<td>23%</td>
<td>26%</td>
<td>21%</td>
<td>22%</td>
<td>24%</td>
</tr>
<tr>
<td>Received mental health treatment</td>
<td>26%</td>
<td>31%</td>
<td>21%</td>
<td>27%</td>
<td>24%</td>
</tr>
<tr>
<td>Family member with diagnosis</td>
<td>43%</td>
<td>37%</td>
<td>48%</td>
<td>46%</td>
<td>38%</td>
</tr>
<tr>
<td>Close friend with diagnosis</td>
<td>48%</td>
<td>56%</td>
<td>41%</td>
<td>56%</td>
<td>38%</td>
</tr>
</tbody>
</table>

*p =<.01  ** p < .001

Note. Race/ethnicity: others include Arab/Middle Eastern, bi/multi-racial, and other self-reported minorities; Education: 0=no schooling completed, 3=high school graduate, 6=associate degree, 7=BA/BS, 10=PhD.

**Participants.** One hundred and nine community members from Amazon MTurk participated in the study. Responses from 3 participants were excluded from the final analyses due to failed responses to simple attention check questions embedded in the online survey. As per Study 1, the exclusion criteria were below age 18 and non-English-speaking. Participants were compensated with USD 2 for part 1 and USD 1 for part 2 of the study. Descriptives for Study 2 participants are listed in Table 9. The mean age for the sample was 37.2 years ($SD =$
and ranged from 19 to 72 years. There were about an equal number of males ($N = 51$) and females ($N = 56$) who were on average, educated and had at least an associate’s degree. The sample was predominantly White (83%) with a small representation of other ethnicities (i.e., 5% Hispanic, 7% Black/ African American, and 3% Asian/ Pacific Islander).

**Procedure.** Study 2 replicated and extended Study 1; and therefore, is also a web-based survey. After informed consent, participants were randomly assigned to either the negative or positive mood condition where they underwent the mood manipulation procedures. Thereafter, they were asked some questions about the content of the text and mood. Participants were then randomly assigned to either the experimental or control vignette condition (as per Study 1) and asked to respond to immediate recall questions about the vignette. A control vignette about a neutral topic (the European economy) was shown to all participants. Following this filler task, the recognition measures were administered and subsequently, self-report cognitive styles and attitudinal measures were given. Lastly, participants were asked to fill in demographic questions and reminded of part 2 of the study.

**Measures.** The same self-reported measures as described in Study 1 were used.

**Manipulation check.** Following Study 1, all participants were asked if they recall the verbatim sentence (“(Name of suspect) has a history of schizophrenia”) in a dichotomous, forced-choice question after the recognition measures, and on a separate screen.
Chapter 15: Study 2 Results

Table 10.

Study 2 Descriptives for Memory Measures

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total</th>
<th>Experimental</th>
<th>Control</th>
<th>Negative mood</th>
<th>Positive mood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failed manipulation check</td>
<td>N=18</td>
<td>N=7</td>
<td>N=6</td>
<td>N=3</td>
<td>N=2</td>
</tr>
<tr>
<td>Reported mood</td>
<td>5.53 (2.38)</td>
<td>5.27 (2.58)</td>
<td>5.80 (2.12)</td>
<td>3.36 (2.07)**</td>
<td>7.15 (1.52)**</td>
</tr>
<tr>
<td>Recall memory</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Part 1: Suspect had mental illness</td>
<td>.26 (.44)</td>
<td>.48 (.51)**</td>
<td>.05 (.22)**</td>
<td>.20 (.41)</td>
<td>.31 (.47)</td>
</tr>
<tr>
<td>Part 1: Mention of mental illness</td>
<td>.20 (.40)</td>
<td>.38 (.49)**</td>
<td>.02 (.15)**</td>
<td>.19 (.40)</td>
<td>.20 (.41)</td>
</tr>
<tr>
<td>Part 1: Mental illness as cause</td>
<td>.30 (.46)</td>
<td>.57 (.50)**</td>
<td>.02 (.15)**</td>
<td>.29 (.46)</td>
<td>.31 (.47)</td>
</tr>
<tr>
<td>Part 2: Suspect had mental illness</td>
<td>.55 (.50)</td>
<td>.84 (.37)*</td>
<td>.21 (.42)*</td>
<td>.56 (.51)</td>
<td>.55 (.51)</td>
</tr>
<tr>
<td>Part 2: Mention of mental illness</td>
<td>.16 (.37)</td>
<td>.28 (.46)**</td>
<td>.03 (.18)**</td>
<td>.22 (.42)</td>
<td>.12 (.33)</td>
</tr>
<tr>
<td>Part 2: Mental illness as cause</td>
<td>.33 (.48)</td>
<td>.50 (.51)*</td>
<td>.14 (.36)*</td>
<td>.37 (.49)</td>
<td>.30 (.47)</td>
</tr>
<tr>
<td>Recognition memory</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Part 1: Old</td>
<td>1.83 (.16)</td>
<td>1.83 (.17)</td>
<td>1.83 (.16)</td>
<td>1.81 (.20)</td>
<td>1.84 (.16)</td>
</tr>
<tr>
<td>Part 1: Unrelated</td>
<td>1.97 (.067)</td>
<td>1.97 (.064)</td>
<td>1.95 (.12)</td>
<td>1.95 (.10)</td>
<td>1.95 (.11)</td>
</tr>
<tr>
<td>Part 1: General inference</td>
<td>1.47 (.23)</td>
<td>1.47 (.24)</td>
<td>1.48 (.25)</td>
<td>1.53 (.25)</td>
<td>1.45 (.26)</td>
</tr>
<tr>
<td>Part 1: Pragmatic inference</td>
<td>1.76 (.27)</td>
<td>1.67 (.27)*</td>
<td>1.81 (.23)*</td>
<td>1.76 (.25)</td>
<td>1.69 (.28)</td>
</tr>
<tr>
<td>Part 2: Old</td>
<td>1.80 (.18)</td>
<td>1.81 (.18)</td>
<td>1.79 (.17)</td>
<td>1.82 (.15)</td>
<td>1.79 (.19)</td>
</tr>
<tr>
<td>Part 2: Unrelated</td>
<td>1.89 (.18)</td>
<td>1.90 (.16)</td>
<td>1.87 (.20)</td>
<td>1.89 (.19)</td>
<td>1.91 (.14)</td>
</tr>
<tr>
<td>Part 2: General inference</td>
<td>1.35 (.26)</td>
<td>1.36 (.27)</td>
<td>1.35 (.23)</td>
<td>1.33 (.27)</td>
<td>1.37 (.25)</td>
</tr>
<tr>
<td>Part 2: Pragmatic inference</td>
<td>1.46 (.33)</td>
<td>1.36 (.32)*</td>
<td>1.56 (.32)*</td>
<td>1.47 (.36)</td>
<td>1.38 (.31)</td>
</tr>
</tbody>
</table>

*p < .01 ** p < .001

Note. Mood: 1=very sad/negative, 9=very positive/happy; Recall memory: 0=no mention, 1=mentioned. Recognition measures: the lower the score, the greater the amount of errors or inference endorsed, ranged from 1 to 2.
Mood manipulation

There were 47 and 58 participants randomly assigned to the negative mood and positive mood manipulation respectively. In the negative mood manipulation condition, responses from 3 participants were removed due to failed mood checks (2 of them had responses that were more than 2 standard deviations above the mean and 1 who did not respond to the questions). For the positive mood manipulation, 2 participants failed the mood check. On the two mood manipulation questions, the two groups differed significantly in their reported current mood, \( t(60.9) = -11.2, p < .001 \); with the positive mood manipulation group endorsing higher scores (i.e., more positive) on the mood measures \( (M = 7.15, SD = 1.52) \) relative to the negative mood manipulation group \( (M = 3.36, SD = 2.07) \) (see Table 10). For the condition manipulation check, 7 participants in the experimental condition and 6 participants in the control condition failed the manipulation check. The final sample tally included 87 participants.

Contrary to hypotheses, there was no significant interaction effect for mood and mental illness prime for both the recall and recognition measures: mention of mental health history in recall of vignette, \( F(1, 81) = .13, p = .72 \); suspect had mental illness, \( F(1, 81) = .11, p = .74 \); mental illness as cause, \( F(1, 81) = .074, p = .79 \); pragmatic inference, \( F(1, 81) = .87, p = .35 \).

Only a main effect for mental illness prime manipulation was found: mention of mental health history, \( F(1, 81) = 17.7, p < .001, \eta^2 = .19 \); suspect had mental illness, \( F(1, 81) = 21.4, p < .001, \eta^2 = .22 \); mental illness as cause, \( F(1, 81) = 40.8, p < .001, \eta^2 = .34 \); pragmatic inference, \( F(1, 81) = 7.43, p = .008, \eta^2 = .09 \).

As seen from Table 10, there were no significant differences found between participants assigned to the negative or positive mood manipulation condition for mention of mental illness while recounting the story, \( t(83) = -.11, p = .91 \); reporting that the suspect had a mental illness,
\( t(82) = -1.09, p = .28 \); and using mental illness as a causal factor for the incident, \( t(82) = -0.20, p = .84 \). Conversely, the mental illness prime manipulation had a significant impact on reporting the role of mental illness in their general impression of the article, \( t(48.7) = -4.51, p < .001 \); impressions of mental illness in the protagonist, \( t(55.4) = -5.05, p < .001 \); and including mental illness as the cause of the incident, \( t(48.7) = -6.77, p < .001 \).

The main effect of mood was also not significant, that is, there were no differences between the two groups on reported recall of information which was contrary to expectations. Participants in the negative mood condition were just as likely \((M = .29, SD = .46)\) to attribute the cause of the incident to mental illness as those in the positive mood condition \((M = .31, SD = .47)\), \( t(82) = -0.20, p = .84 \). Similarly, on recognition measures of memory, no significant main effect of mood was found for all four sub-categories of information tested, including pragmatic inference (see Table 10). Participants in both positive and negative mood conditions performed comparably.
Table 11.

**Study 2 Chi-square results**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Experimental</th>
<th>Control</th>
<th>$\chi^2$</th>
<th>Cohen’s $d$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Part 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suspect had mental illness</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>20 (48%)</td>
<td>2 (5%)</td>
<td>20.0 **</td>
<td>1.12</td>
</tr>
<tr>
<td>No</td>
<td>22 (52%)</td>
<td>40 (95%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mention of mental illness</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>16 (38%)</td>
<td>1 (2%)</td>
<td>17.0 **</td>
<td>1.01</td>
</tr>
<tr>
<td>No</td>
<td>26 (62%)</td>
<td>42 (98%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental illness as cause</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>24 (57%)</td>
<td>1 (2%)</td>
<td>30.1 **</td>
<td>1.49</td>
</tr>
<tr>
<td>No</td>
<td>18 (43%)</td>
<td>41 (98%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Part 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suspect had mental illness</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>27 (84%)</td>
<td>6 (21%)</td>
<td>23.9 **</td>
<td>1.53</td>
</tr>
<tr>
<td>No</td>
<td>5 (16%)</td>
<td>22 (79%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mention of mental illness</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>9 (28%)</td>
<td>1 (3%)</td>
<td>6.76 *</td>
<td>0.68</td>
</tr>
<tr>
<td>No</td>
<td>23 (72%)</td>
<td>28 (97%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental illness as cause</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>16 (50%)</td>
<td>4 (14%)</td>
<td>8.57 *</td>
<td>0.78</td>
</tr>
<tr>
<td>No</td>
<td>16 (50%)</td>
<td>24 (86%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < .01, ** p < .001  
Note. N (Part 1) = 84-87, N (Part 2) = 65-66

As seen from Table 11, almost half the participants in the experimental condition attributed the cause of the incident to mental illness whereas only 2% of participants ($n=1$) in the control condition reported the link between mental illness and cause. The proportion of participants who mentioned mental illness as a cause differed by condition they were assigned to, $\chi^2(1, N=84) = 30.1, p < .001, d = 1.49$.

Similarly, about 38% of participants in the experimental condition mentioned the presence of mental illness in their brief summary of the article compared to only 2% in the control condition. A significant difference in responses mentioning mental illness between the control and experimental conditions was found, $\chi^2(1, N=85) = 17.0, p < .001, d = 1.01$. A
moderate positive correlation is also found for mention of mental health history in the respondent’s brief summary and attribution of mental illness as a causal factor, $r(84) = .44$, $p < .001$ (Table 12). This suggests that participants who recalled the mental health history piece of information also tended to report mental illness having a role in causing the violent incident.

When asked about their impressions of the suspect, 48% of the participants in the experimental condition mentioned mental illness in their brief conceptualization while only 5% of the participants in the control condition brought up mental illness. A significant difference was found between the conditions, $\chi^2(1, N=84) = 20.0$, $p < .001$, $d = 1.12$.

An independent samples $t$-test was conducted to examine differences on the recognition memory performance between the control and experimental group. As hypothesized, all participants would exhibit comparable memory for unambiguous information mentioned in the target article, but participants in the experimental condition will endorse significantly more false positives for items that were pragmatically implied and that is plausible (i.e., consistent with mental illness stereotypes). The only significant difference between the groups was for the pragmatic inference items, $t(88) = 2.60$, $p = .011$, Cohen’s $d = .55$, a medium effect size where the mean recognition endorsement of mental illness stereotype, evident of pragmatic inference, was 1.74 ($SD = .26$) for the control group and 1.67 ($SD = .27$) for the experimental group (see Table 10). A lower score indicates a greater extent of pragmatic inference.
Table 12.

**Study 2 Descriptives for Attitudinal Measures**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total (N=84-87)</th>
<th>Experimental (N=42-43)</th>
<th>Control (N=42-44)</th>
<th>Negative mood (N=36-37)</th>
<th>Positive mood (N=48-50)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitudes towards mental illness - Total</td>
<td>2.45 (.63)</td>
<td>2.46 (.56)</td>
<td>2.44 (.69)</td>
<td>2.54 (.58)</td>
<td>2.38 (.65)</td>
</tr>
<tr>
<td>Negative stereotypes</td>
<td>3.09 (.90)</td>
<td>3.17 (.85)</td>
<td>3.01 (.94)</td>
<td>3.17 (.79)</td>
<td>3.02 (.97)</td>
</tr>
<tr>
<td>Recovery</td>
<td>4.03 (.69)</td>
<td>4.08 (.66)</td>
<td>3.98 (.73)</td>
<td>3.94 (.65)</td>
<td>4.10 (.72)</td>
</tr>
<tr>
<td>Reported and intended behavior scale</td>
<td>3.51 (.88)</td>
<td>3.54 (.94)</td>
<td>3.47 (.83)</td>
<td>3.43 (.81)</td>
<td>3.56 (.93)</td>
</tr>
<tr>
<td>Need for cognition</td>
<td>3.61 (.72)</td>
<td>3.48 (.80)</td>
<td>3.73 (.60)</td>
<td>3.47 (.73)</td>
<td>3.70 (.69)</td>
</tr>
<tr>
<td>Need for closure – Total</td>
<td>3.43 (.50)</td>
<td>3.59 (.47)*</td>
<td>3.35 (.57)*</td>
<td>3.48 (.48)</td>
<td>3.41 (.52)</td>
</tr>
<tr>
<td>Closemindedness</td>
<td>2.59 (.64)</td>
<td>2.80 (.64)*</td>
<td>2.47 (.62)*</td>
<td>2.57 (.65)</td>
<td>2.60 (.64)</td>
</tr>
<tr>
<td>Order</td>
<td>3.70 (.78)</td>
<td>3.81 (.70)</td>
<td>3.62 (.81)</td>
<td>3.78 (.75)</td>
<td>3.65 (.79)</td>
</tr>
<tr>
<td>Predictability</td>
<td>3.63 (.89)</td>
<td>3.95 (.77)**</td>
<td>3.41 (.92)**</td>
<td>3.69 (.88)</td>
<td>3.59 (.91)</td>
</tr>
<tr>
<td>Decisiveness</td>
<td>3.13 (.89)</td>
<td>3.02 (.88)</td>
<td>3.27 (.91)</td>
<td>2.99 (.99)</td>
<td>3.23 (.81)</td>
</tr>
<tr>
<td>Ambiguity</td>
<td>3.94 (.68)</td>
<td>4.15 (.69)*</td>
<td>3.82 (.69)*</td>
<td>4.05 (.65)</td>
<td>3.87 (.70)</td>
</tr>
<tr>
<td>Social desirability scale</td>
<td>1.45 (.25)</td>
<td>1.45 (.26)</td>
<td>1.45 (.24)</td>
<td>1.38 (.25) *</td>
<td>1.51 (.23) *</td>
</tr>
</tbody>
</table>

*p < .05, **p < .01

Note. Attitudes towards mental illness: 1=strongly disagree, 5=strongly agree (the higher the more stigmatizing); Reported and intended behavior scale: 1=agree strongly, 5=disagree strongly (the higher the score, the less stigmatizing); Need for closure: 1=strongly disagree, 6=strongly agree (the higher the score, the greater the need); Need for cognition: 1=extremely uncharacteristic, 5=extremely characteristic (the higher score, the greater need for cognition); Social desirability scale: the higher the score, the more socially desirable the participant scored.
Table 13.

Study 2 Correlation matrix among proposed dependent and control variables (N = 84-87)

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Part 1: Suspect had mental illness</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Part 1: Mention of mental health history</td>
<td>.58*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Part 1: Mental illness as cause</td>
<td>.44*</td>
<td>.26</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Mental illness diagnosis (self)</td>
<td>-.085</td>
<td>-.10</td>
<td>.023</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Received treatment (self)</td>
<td>-.17</td>
<td>-.066</td>
<td>-.076</td>
<td>.94**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Family member with diagnosis</td>
<td>.078</td>
<td>-.048</td>
<td>-.015</td>
<td>.25</td>
<td>.24</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Close friend with diagnosis</td>
<td>-.15</td>
<td>-.059</td>
<td>.18</td>
<td>.24</td>
<td>.24</td>
<td>.33*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Part 1: Recognition – Old</td>
<td>-.035</td>
<td>-.008</td>
<td>.006</td>
<td>.019</td>
<td>.027</td>
<td>-.32*</td>
<td>-.049</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Part 1: Recognition – Unrelated</td>
<td>-.15</td>
<td>-.033</td>
<td>-.046</td>
<td>.11</td>
<td>.078</td>
<td>-.081</td>
<td>-.090</td>
<td>.026</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

*p < .01, **p < .001

Note. Recognition measures: the lower the score, the greater the associated error or extent of inference
Table 14.

Study 2 Correlation matrix among proposed dependent and moderator variables (attitudes towards mental illness)

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Part 1: Suspect had mental illness</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Part 1: Mention of mental health history</td>
<td>.58*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>3. Part 1: Mental illness as cause</td>
<td>.44*</td>
<td>.26</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Part 1: Pragmatic inference</td>
<td>-.25</td>
<td>-.22</td>
<td>-.15</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>5. Part 2: Suspect had mental illness</td>
<td>.15</td>
<td>.16</td>
<td>.42*</td>
<td>-.31</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Part 2: Mention of mental health history</td>
<td>.31</td>
<td>.31</td>
<td>.22</td>
<td>-.064</td>
<td>.23</td>
<td>1</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>7. Part 2: Mental illness as cause</td>
<td>.22</td>
<td>.16</td>
<td>.49*</td>
<td>-.43*</td>
<td>.43*</td>
<td>.16</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Part 2: Pragmatic inference</td>
<td>-.36</td>
<td>-.34</td>
<td>-.32</td>
<td>.43*</td>
<td>-.22</td>
<td>.11</td>
<td>-.37</td>
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<tr>
<td>9. AMIS (Total)</td>
<td>-.027</td>
<td>-.017</td>
<td>-.044</td>
<td>-.19</td>
<td>-.019</td>
<td>.13</td>
<td>-.11</td>
<td>-.079</td>
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<td>10. AMIS – negative stereotypes</td>
<td>.14</td>
<td>.13</td>
<td>.038</td>
<td>-.22</td>
<td>-.10</td>
<td>.089</td>
<td>.021</td>
<td>-.25</td>
<td>.82*</td>
<td>1</td>
<td></td>
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<tr>
<td>11. AMIS – recovery</td>
<td>.17</td>
<td>.15</td>
<td>.10</td>
<td>-.087</td>
<td>-.070</td>
<td>-.12</td>
<td>.20</td>
<td>-.12</td>
<td>.82*</td>
<td>-.32*</td>
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<tr>
<td>12. RIBS</td>
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<td>.008</td>
<td>.023</td>
<td>.18</td>
<td>.059</td>
<td>-.24</td>
<td>.054</td>
<td>-.13</td>
<td>.58*</td>
<td>-.43*</td>
<td>.51*</td>
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<tr>
<td>13. Social desirability</td>
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<td>.062</td>
<td>.038</td>
<td>-.11</td>
<td>-.030</td>
<td>.086</td>
<td>.19</td>
<td>.078</td>
<td>.002</td>
<td>.024</td>
<td>-.062</td>
<td>-.20</td>
</tr>
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</table>

** p < .001

Note. AMIS = Attitudes towards mental illness; RIBS = Reported and Intended Behaviour Scale; N (Part 1) = 84-87, N (Part 2) = 63-65
Table 15.

**Study 2 Correlation matrix among proposed dependent and moderator variables (cognitive styles)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Part 1: Suspect had mental illness</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Part 1: Mention of mental health history</td>
<td>.58**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>3. Part 1: Mental illness as cause</td>
<td>.44**</td>
<td>.26</td>
<td>1</td>
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<td></td>
</tr>
<tr>
<td>4. Part 1: Pragmatic inference</td>
<td>-0.21</td>
<td>-0.22</td>
<td>-0.16</td>
<td>1</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Part 2: Suspect had mental illness</td>
<td>0.15</td>
<td>0.16</td>
<td>.43**</td>
<td>.31</td>
<td>1</td>
<td></td>
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</tr>
<tr>
<td>6. Part 2: Mention of mental health history</td>
<td>.31</td>
<td>.31</td>
<td>0.17</td>
<td>-0.064</td>
<td>0.23</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Part 2: Mental illness as cause</td>
<td>0.22</td>
<td>.16</td>
<td>.49**</td>
<td>-.43**</td>
<td>.43**</td>
<td>.16</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>8. Part 2: Pragmatic inference</td>
<td>-.36</td>
<td>-.34</td>
<td>-.32</td>
<td>.43**</td>
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<td>-.37</td>
<td>1</td>
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<tr>
<td>9. Need for cognition</td>
<td>-.027</td>
<td>-.11</td>
<td>.026</td>
<td>.29</td>
<td>-.12</td>
<td>.071</td>
<td>-.006</td>
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<tr>
<td>10. NFCS – Total</td>
<td>.13</td>
<td>.14</td>
<td>-.001</td>
<td>-.085</td>
<td>-.058</td>
<td>.089</td>
<td>.047</td>
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<td>-.32</td>
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<tr>
<td>11. NFCS – Closemindedness</td>
<td>.13</td>
<td>.27</td>
<td>-.019</td>
<td>-.061</td>
<td>.15</td>
<td>.13</td>
<td>.082</td>
<td>-.32</td>
<td>-.40**</td>
<td>.61**</td>
<td>1</td>
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<td></td>
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<tr>
<td>12. NFCS – Order</td>
<td>-.028</td>
<td>-.055</td>
<td>.081</td>
<td>.016</td>
<td>.052</td>
<td>.059</td>
<td>.089</td>
<td>.008</td>
<td>-.28</td>
<td>.75**</td>
<td>0.21</td>
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<td></td>
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<tr>
<td>13. NFCS – Predictability</td>
<td>.21</td>
<td>.18</td>
<td>.112</td>
<td>-.13</td>
<td>.11</td>
<td>.20</td>
<td>.016</td>
<td>-.032</td>
<td>-.32</td>
<td>.81**</td>
<td>.39**</td>
<td>.57**</td>
<td>1</td>
<td></td>
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<tr>
<td>14. NFCS – Decisiveness</td>
<td>-.13</td>
<td>-.042</td>
<td>-.20</td>
<td>-.027</td>
<td>-.33</td>
<td>-.081</td>
<td>-.12</td>
<td>-.02</td>
<td>.26</td>
<td>.27</td>
<td>-.021</td>
<td>0.13</td>
<td>-.11</td>
<td>1</td>
</tr>
<tr>
<td>15. NFCS – Ambiguity</td>
<td>.24</td>
<td>.19</td>
<td>.039</td>
<td>-.12</td>
<td>-.066</td>
<td>.058</td>
<td>-.028</td>
<td>-.19</td>
<td>-.28</td>
<td>.79**</td>
<td>.57**</td>
<td>.36**</td>
<td>.69**</td>
<td>-.02</td>
</tr>
</tbody>
</table>

*p < .0025; **p < .001

Note. NFCS = Need for closure scale; N (Part 1) = 84-87, N (Part 2) = 63-65
Self-report measures on cognitive styles, social attitudes, and response style

Given the large number of pairwise correlations being examined, bonferroni correction to the $p$-value is set at .0025 for the self-report measures and main dependent variables.

Social desirability scale

As seen from Table 12, there were no differences found between the experimental ($M=1.45$, $SD=.26$) and control ($M=1.45$, $SD=.24$) group on the Marlowe-Crowne Social Desirability Scale (M-C SDS; Crowne & Marlowe, 1960). However, participants randomly assigned to the positive mood condition appeared to endorse more items indicating higher social desirability ($M=1.51$, $SD=.23$) relative to those in the negative mood manipulation ($M=1.38$, $SD=.25$), $t(85) = 2.50$, $p = .014$ (see Table 12). For the current sample, social desirability did not significantly correlate with any of the dependent memory measures (Table 14) and thus, does not significantly impact on the dependent measures. Overall internal consistency for the scale, Cronbach’s $\alpha = .75$.

Need for cognition scale

Per Table 12, no significant difference was found between the experimental ($M=3.48$, $SD=.80$) and control sample ($M=3.47$, $SD=.83$), $t(85) = 1.59$, $p = .12$. Similarly, there was no significant difference in the need for cognition between the positive ($M=3.70$, $SD=.69$) and negative mood ($M=3.47$, $SD=.73$) condition, $t(85) = 1.59$, $p = .12$. The mean for the overall sample was $3.61$ ($SD = .72$). No significant correlations was found. The consistency of the scale, Cronbach’s $\alpha = .94$.

Need for closure scale

There were a total of 88 complete responses for the need for closure scale. As suggested by the authors, scores above 15 on the embedded “Lie” scale should be removed from further
analyses, bringing the final total to 76 valid responses. The overall mean for the sample is 3.43 ($SD = .50$). Significant differences between the experimental and control condition were found for the total scale, Predictability, and Ambiguity subscales. The experimental group scored higher on the total scale, ($M$=3.59, $SD=.47$) as compared to the control condition ($M$=3.35, $SD=.57$), $t(86) = -2.63$, $p = .01$. The experimental participants also endorsed greater extent of ambiguity ($M$=4.14, $SD=.67$) compared to the control group ($M$=3.47, $SD=.62$), $t(86) = -2.91$, $p = .005$. The Closemindedness subscale measures one’s propensity to consider alternative explanations. On the Predictability subscale, participants in the experimental condition exhibited a greater need for order and structure in their environments ($M$=3.95, $SD=.68$) relative to those in control condition ($M$=3.41, $SD=.92$), $t(84) = -3.05$, $p = .003$. For the recall measure, the number of participants who self-reported as high versus low in need for closure were too small for further chi-square analyses. As seen from Table 15 too, no significant correlations between the subscales and memory measures were found.

Participants high in need for closure and/or need for cognition were hypothesized to engage in less pragmatic inference during the recognition measures. Bivariate correlational analyses were conducted to explore the relationship between the cognitive measures, attitudes towards mental illness, social desirability, and accuracy on the performance measures. Table 15 shows the correlations between the measures. The hypothesis that need for closure would be significantly correlated with pragmatic inference was not supported, as was the hypothesis for need for cognition. Specifically, there did not appear to be a significant relationship between one’s reported cognitive style and tendency to engage in pragmatic inference. Also, none of the subscales for the need for closure scale correlated with the recognition measures.
**Attitudes towards Mental Illness Scale (AMIS)**

The overall mean score for the sample was 2.45 (SD=.63) and no differences were found between either the experimental and control group, $t(85) = -0.085, p = .933$, or the negative and positive mood group, $t(85) = 1.18, p = .24$ (see Table 12). Similarly, there were no significant differences between the groups on the two subscales (Negative Stereotypes and Recovery). As seen from Table 14, scores on the total and subscales did not significantly correlate with any of the recall and recognition memory measures. The overall internal consistency for the total 7-item scale, Cronbach’s $\alpha = .79$, for the Negative Stereotypes subscale, Cronbach’s $\alpha = .81$, and the Recovery subscale, Cronbach’s $\alpha = .80$.

**Reported and Intended Behaviour Scale (RIBS)**

As per Table 12, the overall mean for the scale was 3.51 (SD=.88). Both the experimental and control condition reported comparable scores, $t(85) = -.36, p = .72$, and the same pattern was found between negative and positive mood condition, $t(85) = -.66, p = .51$. No significant correlations was found between the dependent measures and RIBS total and subscales. Internal consistency for the scale was, Cronbach’s $\alpha = .87$.

Overall, scores on two different attitudinal measures towards mental illness did not significantly correlate with recognition measures. Therefore, the hypothesis that participants who reported greater stigmatizing attitudes towards persons with mental illness will exhibit greater pragmatic inference in the mental illness stereotype prime condition is not supported.
PART 2

A total of 83 responses were recorded and 79 respondents were able to be matched with their responses from Part 1. Of the 79 matched respondents, 66 participants who passed the mental illness manipulation check also fully completed the questionnaires and were included in the final analyses.

Table 16.

*Paired samples t-test results between Part 1 and 2 of Study 2*

<table>
<thead>
<tr>
<th>Time</th>
<th>Part 1</th>
<th>Part 2</th>
<th>t</th>
<th>df</th>
<th>Cohen’s d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recall measures</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suspect had mental illness</td>
<td>.29 (.46)</td>
<td>.53 (.50)</td>
<td>-2.92*</td>
<td>57</td>
<td>.77</td>
</tr>
<tr>
<td>Mention of mental illness</td>
<td>.22 (.42)</td>
<td>.17 (.38)</td>
<td>1.62</td>
<td>59</td>
<td>-</td>
</tr>
<tr>
<td>Mental illness as cause</td>
<td>.33 (.47)</td>
<td>.31 (.47)</td>
<td>-.24</td>
<td>57</td>
<td>-</td>
</tr>
<tr>
<td>Recognition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Old items</td>
<td>1.83 (.16)</td>
<td>1.79 (.18)</td>
<td>2.03</td>
<td>65</td>
<td>-</td>
</tr>
<tr>
<td>Unrelated items</td>
<td>1.97 (.07)</td>
<td>1.89 (.17)</td>
<td>3.44*</td>
<td>61</td>
<td>.09</td>
</tr>
<tr>
<td>General inference items</td>
<td>1.48 (.23)</td>
<td>1.36 (.26)</td>
<td>3.29*</td>
<td>60</td>
<td>.12</td>
</tr>
<tr>
<td>Pragmatic inference items</td>
<td>1.77 (.27)</td>
<td>1.46 (.33)</td>
<td>7.54**</td>
<td>62</td>
<td>.23</td>
</tr>
</tbody>
</table>

* p < .05, ** p < .001
Note: Recall measures: Mental illness not reported = 0, Mental illness reported = 1

As seen in Table 16, the only significant difference in recall measures between Part 1 ($M=.29, SD=.46$) and Part 2 ($M=.53, SD=.50$) was for the impression of suspect, $t(57) = -2.92, p = .005, d = .77$. Specifically, after a one-week delay, more participants reported that the suspect had mental illness. No differences were found for reporting mental illness as cause and mention of mental illness in vignette.

Overall, recognition memory appeared to worsen after a week, other than the old items which were verbatim items taken from the article (see Table 16). The extent of pragmatic
inference was significantly greater (evidenced by the lower score) a week later ($M=1.46$, $SD=.33$) relative to the first presentation of the article ($M=1.77$, $SD=.27$), $t(62) = 7.54$, $p < .001$, $d = .23$, a small effect size. Similarly, there was evidence of greater general inference made in Part 2 of the study ($M=1.36$, $SD=.26$) than Part 1 ($M=1.48$, $SD=.24$), $t(60) = 3.29$, $p = .001$, $d = .12$. Contrary to expectations though, there was also a significant difference in performance on the unrelated items. Specifically, participants were more inaccurate in Part 2 ($M=1.89$, $SD=.17$) than Part 1 ($M=1.97$, $SD=.07$), $t(61) = 3.44$, $p < .05$, $d = .09$. Of note, the effect sizes for the latter two results are almost negligible and thus, not discussed further.
Chapter 16: Study 2 Discussion

Similar to Study 1, a main effect of mental illness prime was found whereby participants in the experimental condition exhibited a greater extent of pragmatic inference on the recognition memory measures. That is, participants were more likely to misremember pragmatically implied information that was consistent with negative stereotypes of mental illness. Additionally, in the immediate recall measures, participants in the experimental condition were more likely to report that the suspect has a mental illness and that mental illness had a role in causing the violent incident.

In the delayed recall measures, the only significant difference after the time delay was for impression of suspect where participants were more likely to report that the suspect had a mental illness. Relative to Study 1, no significant difference was found in the recall question asking about the cause of the incident. The pattern of results for the recognition measures after the one-week delay were similar to Study 1. A significant difference was found for the pragmatic inference measure which indicates that a greater degree of pragmatic inference was greater after the one-week delay. There were also differences found between the other recognition measures; however, the effect sizes for these measures were negligible relative to pragmatic inference.

The main interaction between mood and mental illness stereotype prime was not supported, and neither was the main effect of mood. Mood manipulation did not appear to significantly affect participants’ memory of the target article. Overall, self-report measures of attitudes towards mental illness and information processing styles did not significantly correlate with the dependent memory variables.
Given the wide range and amount of information that is typically presented in a news article, it is unclear how the casual reader of news actually processes the material. Past studies have suggested a negatively biased representation of persons with mental illness in the media (Corrigan et al., 2005; Diefenbach, 1997; Granello & Pauley, 2000; Wahl, 1992, 2003; Wahl et al., 2002) and researchers have strongly suggested that this representation has led to more stigmatizing attitudes towards mental illness in the general public (Corrigan et al., 2013; McGinty et al., 2013). Thus, Study 1 examined if the lay public are more inclined to adopt stereotypical beliefs about mental illness (i.e., persons with mental illness are unpredictable and dangerous) when they are primed with the concept of mental illness while reading an article on a violent incident. Results supported the main effect of mental illness prime where participants who were provided with a single line, *the suspect had a history of schizophrenia*, were significantly more likely to report mental illness had a role in causing the violent incident. This was in contrast to participants in the control condition who mentioned a myriad of causes including unemployment, drug use, robbery, and unknown causes. Of note, participants in the experimental group of both studies were 10-15 times more likely to report mental illness as the cause of the crime.

Additionally, when participants were tested on recognition measures for their memory of the article, the experimental group exhibited a greater tendency to engage in pragmatic inference that was heavily biased by negative stereotypes of mental illness. That is, they were more likely to misremember that the article had contained stereotypical information of mental illness, such as the news stating that it was the suspect’s mental illness that caused the violence and that the suspect was reported to be unpredictable. Both items were not mentioned in the article but were
misremembered by participants in the experimental condition due to the mental illness history prime and pragmatic inference. After a week’s delay, participants who reported mental illness at the initial encoding stage continued to mention mental illness when asked about the cause of the incident and/or impressions of the perpetrator. Participants’ recognition memory also worsened across board, and there was evidence of greater extent of misremembering stereotypically-biased information.

Study 2 aimed to replicate Study 1 with the mental illness prime manipulation and also, extend the study by examining the potential effects of negative and positive mood manipulation on participants’ memory of presented information. As in Study 1, results from the experiment supported the main effect of mental illness stereotype prime; participants in the mental illness prime condition were significantly more likely to state the cause of the violent incident as the suspect’s history of schizophrenia and misremember mental illness stereotype-consistent information as being reported in the news article they had read. However, there was no interaction effect of mood and mental illness prime found which suggests that mood did not have a significant impact on the information-processing mechanisms in this context.

Findings from the two studies strongly support the significance, and practical importance, of the mental illness prime in an article on a violent incident, and that this prime subsequently affected readers’ memory of the article. In past studies on the impact of mental illness media, the significance of mentioning mental illness has been documented and lasting effects in the lay person alluded to (Corrigan et al., 2013; McGinty et al., 2013; Wahl et al., 2002). The current line of study was designed to unravel the mechanism, especially in terms of which bits of information stood out to readers and how they remember the information. The results presented provide preliminary evidence that readers engage in pragmatic inference when digesting
information presented in the news. Also, that existing stereotypes impact the process of pragmatic inference by highlighting the parts of information being remembered.

Another corollary implication of the large effects of the mental illness prime found is on the use of pragmatic inference as a mechanism in explaining everyday phenomenon. The current research extends the use of pragmatic inference beyond other facets discussed earlier in reading and social communication (Brewer, 1977), courtroom testimony (Harris & Monaco, 1978), and everyday false memories (McDermott & Chan, 2006). This also suggests its applicability in other areas of research such as racial and gender stereotypes as portrayed in the media.

The pattern of findings here also appears markedly similar to classic stereotype studies where the researchers primed participants with a category or concept (e.g., African American male face) and found the presence of pervasive stereotypical beliefs of the category (e.g., hostile) (Bargh et al., 1996; Dijksterhuis et al., 2000). Therefore, it can be inferred that known stereotypical beliefs of mental illness were activated when participants were primed and subsequently influenced the type of information they remembered from reading the article. Furthermore, self-report questionnaires that specifically assessed for these stereotypical beliefs did not correlate with respondents’ memory for the stimulus which strongly suggests that these stereotypical beliefs are activated in spite of one’s awareness. This adds support to the argument for the automaticity of stereotypes, its pervasiveness, and how it can be influential without one’s conscious effort as put forward by several researchers (e.g., Bargh, 1994, 1999; Greenwald & Banaji, 1995; Uleman et al., 2008).

Thus, the lay person who may not report negative attitudes nonetheless is likely exposed to existing negative stereotypes of mental illness and is thus susceptible to their influence. This has wide-ranging implications for the media as the inclusion of relevant, and pertinent,
information should undergo a thoughtful process that does not exacerbate the stigma of persons 
with mental illness. Past content analyses of the media have already highlighted the widespread 
use of negative information being reported alongside mental illness (Corrigan et al., 2005; 
Diefenbach, 1997; Granello & Pauley, 2000; Klin & Lemish, 2008; Wahl, 1992; Wahl et al., 
2002). The current paradigm used further drives home the point that any small piece of 
information that can be as innocuous as “Mr. John Doe has a history of schizophrenia” could 
spark off stereotypical beliefs and biased one’s memory of information resulting in recounting of 
stories that are at times, just plain wrong and stigmatizing (for example, as one respondent wrote, 
“the schizophrenic guy had an episode of some sort”).

In terms of stigma reduction interventions, the current pattern of results can help to 
inform their efficacy. A recent review was conducted on the effectiveness of mass media 
interventions in reducing the stigma of mental illness. Results were generally inconclusive and 
pointed to small effects but slightly more supportive for prejudice, encompassing reported 
attitudes and beliefs, relative to discrimination, defined as tangible behavior experienced and 
reported. The authors highlighted some significant limitations in this area of research, such as 
the lack of standardized and sound research methods in these research, over-dependence on 
students as participants, and not fully understanding the mechanism in which mass media 
intervention is purported to have (Clement et al., 2013). The current studies can aid in providing 
some empirical evidence for several of the questions raised. First, no differences were found 
between students and community members in the dependent measures and thus, this adds to the 
ecological validity of using students as participants. With regard to improving methodological 
issues, this study adds to the literature by providing another form of dependent measure, that is, 
using memory variables to assess degree of stigma in addition to the usual direct questions on
attitudes towards mental illness. The current research paradigm also offers a direct test of the proposed mechanism of how one perceives and remember information presented in the media, and also provides a glimpse of the potential effect of more responsible journalism in the control condition where there was a significant lack of stigmatizing responses and information remembered.

When the self-report data from both Study 1 and 2 was collapsed into one analysis to increase power, the only significant result was for the negative stereotypes subscale as measured on the Attitudes Towards Mental Illness scale and pragmatic inference recognition measure, $r(237) = -.13, p = .04$, indicating that the greater the extent of negative stereotypes endorsed, the more greater the degree of pragmatic inference. This supports the theory underlying the interplay of social (stereotypes) and cognitive (pragmatic inference) factors in understanding the overwhelmingly negative beliefs lay people have of persons with mental illness. However, the effect remains rather small relative to the main effect of mental illness prime. The other null findings for the rest of the self-reported attitudes towards mental illness and the outcome variables also suggest that this mechanism in digesting and remembering information occurs largely uniformly in the lay person. Thus, this implies that increased responsibility and prudence in the media can lead to more effective stigma reduction in disseminating news, relative to psychoeducation on mental illness to the public. Of course, that is not to say that the latter is ineffective and should be ignored. Rather, it highlights the one-sidedness of media portrayal of information and the entrenched negative stereotypes in society that unwittingly and pervasively affects one’s processing of presented information (Nordt, Rössler, & Lauber, 2006). The first step thus is to reduce the associations of negative stereotypes and one way to initiate this process is to start with the media’s choice in leaving out irrelevant information given its influence in

Regarding potential moderating factors, no significant correlations were found between most of the self-report attitudinal measures towards mental illness and information processing styles. The null findings in this area was surprising, given the literature that has covered potential moderating factors on stereotype activation and application. Future research would benefit from examining the other potential factors such as goals (Moskowitz et al., 1999) and context of the responses (Wittenbrink et al., 2001).

**Clinical implications**

Mental health professionals have been found to also endorse stigmatizing attitudes and beliefs towards persons with mental illnesses (Caldwell & Jorm, 2001; Rao et al., 2009) and even reported comparable low desired level of interaction as the public (Nordt et al., 2006). While this study did not seek to recruit these professionals, it is suggestive of the deep-rooted stereotypical biases that society in general has of mental illness and which the professionals are not immune to as the mentioned studies have shown. Additionally, the current results point to the automaticity in which these stereotypes operate in and influence memory and information, mental health professionals involved in clinical judgment about persons with mental illness would benefit from being extra mindful about the mindset and information they are using to base their judgment on.

One particularly relevant finding in past memory studies was that the phenomenological experiences of false and real memories were not reported to be different in cases of pragmatic inference (Chan & McDermott, 2006). While this was not explicitly tested in the current studies, it plausibly follows past research findings. Furthermore, the endorsement of pragmatically
implied information in the recognition measures indicate that the information was initially encoded by participants as such, and thus logically, the “false” memory here would not differ from the factually real memories experientially. Practically, this can help explain why social psychological processes such as confirmation bias further reinforce stereotypes and the general difficulty in implementing effective stigma reduction programs (Clement et al., 2013).

**Limitations and Future Directions**

One potential explanation for the significant results of mental illness prime may be due to the types of questions asked and mental health-related questionnaires which may have served as a general prime for mental illness. However, the same questions were asked of the control group and additional study check questions at the end of the survey did not indicate any particular suspicions from the participants.

The impact of overall mood on the main dependent memory measures in the study was not significant. Besides the plausible reason of a small sample size, another reason that could explain the lack of effect is the types of mood, positive (happy) and negative (sad), that were examined in the present study. It is possible that other types of negative moods such as fear and anger may be more relevant to the violent news article and effect a greater impact. Past research has shown support in the differential effects of various negative mood states such as anger versus sadness in social information processing (Bodenhausen et al., 1994b), fear versus anger in beliefs and attitudes relating to perceived risks of threat (Lerner et al., 2003), and anger, sadness, and fear in attitudes towards public policies as a response to crime and accident news articles (Solloway, Slater, Chung, & Goodall, 2015). As the present studies were conducted solely online, happy and sad moods were chosen to bolster the efficacy of the online mood induction methods from past literature supporting the viability of the inductions (Goritz, 2007; Verheyen &
Goritz, 2009) and also for potential ethical concerns about inducing anger moods virtually. Future research, if done in person, could explore differences between the negative mood states.

The overwhelming null findings for the self-report measures appear to suggest that individual differences did not impact on one’s processing of presented information. One limitation could be the need of a larger sample to discern the smaller effects of these proposed attitudes and information-processing styles. Additionally, only explicit attitudes were assessed in this study and the target vignette and subsequent questions may have made participants more aware of the target measures of the studies despite having some control measures such as the neutral (control) article during the retention period and interspersing attitudinal questionnaires with information processing style questionnaires. Given that the influence of stereotypical beliefs on pragmatic inference is postulated to occur on a tacit level, implicit attitudes would potentially be a moderator and should be measured in future studies. Implicit attitudes have been found to be present even in the absence of explicit bias (Teachman et al., 2006) and its importance in social attitudes emphasized (Stier & Hinshaw, 2007). Therefore, measuring participants’ implicit attitudes would be illuminating in further studies to determine if individual difference in beliefs can potentially impact on the processing mechanism.

Contact with mental illness was measured in the study and did not correlate with the dependent measures of stigmatized responses, save for one variable (close friend with diagnosis) which correlated only with one recall measure and was not replicated in Study 2. The current results follow the general pattern of inconclusive, and at times contradictory, findings in past literature (Alexander & Link, 2003; Couture & Penn, 2003). It may be that the present questions are not nuanced enough in terms of assessing the quality and nature of contact. Future research examining the experience of one’s contact with mental illness would illuminate its viability as a
moderating factor. It would also be interesting to examine current mental health professionals’
stereotypical beliefs and extent of pragmatic inference. Some studies have indicated that people
working in the mental health field also hold similar stereotypical beliefs about persons with
serious mental illness as the general public (Caldwell & Jorm, 2001), and more negative attitudes
about recovery (Jorm, Korten, Jacomb, Christensen, & Henderson, 1999). Thus, it is likely that
mental health professionals would exhibit a similar extent of stereotypically-biased pragmatic
inference.
Appendix A: Vignette of Target News Article

Instructions:
Please read the following article carefully. You will be asked questions about the article after.

 Arrest Made in Fatal Beating of 68-Year-Old

The police arrested a 20-year-old man Tuesday in connection with the fatal sidewalk attack of a 68-year-old man on Friday, the authorities said. The police said they were holding the suspect, John Doe, on charges of murder, robbery and assault.

Surveillance video captured the attack, which occurred Friday evening on East Sixth Street. The footage shows a man cornering a smaller man, hurling him against a wall and then stomping on him as he lies crumpled on the ground. The assailant then walks away. Several people pass by the victim, H. Brown, a retired garment factory worker, but do not come to his assistance. After several minutes, a woman kneels next to him; the police arrive sometime later.

Mr. Brown was taken to St. Luke’s Roosevelt Hospital Center, where he died from his injuries on Saturday.

The Ninth Precinct detective squad, which covers the East Village, received a tip on Tuesday, not long after midnight, that the man they were looking for was in the neighborhood, the police said, adding that Mr. Doe was taken into custody soon afterward.

Investigators believe that Mr. Doe had sought to rob Mr. Brown. In custody, Mr. Doe did not give a statement to detectives, the police said.

The police have said Mr. Brown was most likely identified as a vulnerable target for a robbery, but have provided no other details for why he was singled out. Mr. Brown came to the United States 20 years ago. In his retirement he spent much of his free time at the local community centers. He lived on Avenue C, just around the corner and down the block from where he was attacked.
Mr. Doe, who lives in a housing development on the Lower East Side that is also near the site of the attack, has been arrested numerous times, on charges that include criminal trespass; most of the cases against him, however, have been sealed. *Mr. Doe also reportedly has a history of schizophrenia.* *(for experimental condition)*

Relatives of Mr. Doe could not immediately be reached for comment. The Legal Aid Society, which is representing Mr. Doe in a prior case, said the judge would assign him a lawyer during his arraignment hearing if he needed one.

One of Mr. Brown’s daughters, Jenny, declined to speak to a reporter by phone. At a memorial on Monday, she was despondent, dropping to her knees and wailing that she had not been there to help her father: “So many people passed. They didn’t help, they didn’t call the police. Why wasn’t I here when you needed me?”
Appendix B: Vignette of Control News Article

Instructions:
Please read the following article carefully. You will be asked questions about the article after.

Europe must 'boost demand' to revive economy, US warns

The US Treasury Secretary has urged eurozone countries to "boost demand" in order to reduce unemployment and avoid deflation. Jack Lew was speaking at a meeting of the G20 group, which includes several of the world's largest economies.

Earlier this month, the European Central Bank introduced new measures to stimulate the area's flagging economy. However it has stopped short of adopting the policies favored by its US counterpart, the Federal Reserve. As well as launching an asset purchase program, through which it will buy debt products from banks, the ECB cut its benchmark interest rate to 0.05%. The bank has been under pressure to kick-start the eurozone economy, as manufacturing output has slowed and inflation has fallen to just 0.3%.

"Europe is going to need to solve its problems and resolve differences it has internally," Mr. Lew told reporters at the meeting in Australia, "but what's clear from the US experience is that the combination of taking action to boost demand in the short run and make structural changes for the long run is an important combination, and it shouldn't become a choice between the two. "You really need to pursue both."

Mr. Lew also expressed concern about the political tensions between European countries, and the effect this may have on pushing through urgent policies.

"The concern that I have is that if the efforts to boost demand are deferred for too long, there is a risk that the headwinds get stronger, and what I think Europe needs is more tailwinds in the economy," he cautioned.
Appendix C: Recognition Questions

Remember the first article you read earlier about an incident involving the police? On the following page, there are 20 statements about the article. Please read each one carefully and indicate whether you remember the specified information from the first article you read. If you think the statement contains correct information from the news article, click on the YES button; if you think that the statement is not accurate based on what you read from the article, click on the NO button. Please give a yes or no answer for each sentence, even if you feel you have to guess. You don’t have to spend too much time on each statement, just give it your best guess and move on to the next statement.

(i)  *Old* items – sentences used in the article
1. The victim was a 68-year-old male.  *(yes)*
3. Surveillance video captured the attack.  *(yes)*
19. The victim’s daughter decline to speak with reporters.  *(yes)*
11. The suspect did not give a statement to the detectives.  *(yes)*
14. The victim came to the United States about 20 years ago and is currently retired.  *(yes)*
15. The victim lived just around the corner and down the block from where he was attacked.  *(yes)*
17. Relatives of the suspect could not be reached for comment.  *(yes)*

(ii)  *Unrelated* items – including features from the original article but is inconsistent with presented information
8. The victim passed away immediately at the scene.  *(no)*
6. The assailant called the ambulance.  *(no)*
12. The police reported that the motivation for the attack was due to provocation by the victim.
2. The suspect was a 20-year-old female.  *(No)*
9. The suspect had no prior arrests.  *(no)*
5. Several people rushed to help the victim when he was being beaten up by the suspect.  *(no)*

(iii)  *Inference* – pragmatically or generally implied by the article
13. The suspect’s mental illness caused the attack.  *(no/pragmatic)*
4. The assailant used a weapon during the attack.  *(no/general)*
16. The police felt that the suspect was unpredictable.  *(no/pragmatic)*
18. The police felt that the suspect was dangerous.  *(no/general)*
20. The suspect was sent by the judge to be psychiatrically evaluated.  *(no/pragmatic)*
7. It took six policemen to subdue and arrest the suspect.  *(no/pragmatic)*
10. The suspect was unemployed.  *(no/general)*
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