REDUCING MENTAL ILLNESS STIGMA: INTERVENTIONS AND MECHANISMS

by

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Abstract

Individuals with mental illness endure pervasive stigma from society because of their condition, which puts them at elevated risk for distress, diminished self-esteem, social maladjustment, and worsened treatment outcomes. Therefore, treating only the symptoms of mental illness is not sufficient to improve the quality of lives of affected individuals. Rather, societal change in reducing stigma of mental illness must occur.

This study tested the efficacy of a commonly used strategy (education-contact intervention; EC), relative to a novel intervention (loving-kindness meditation; LKM), and a control condition on reducing cognitive, affective, and behavioural stigma toward the mental illness of bipolar disorder. This addressed a number of limitations in the existing literature regarding measurement of stigma components and assessment of intervention efficacy.

Three hundred seventy-six participants watched a 15-minute video corresponding to one of the three conditions: EC, LKM, or control. Then, they completed a self-report measure of affective, cognitive, and behavioural stigma toward a hypothetical person with bipolar disorder, and an implicit stigma measure. Participants also interacted with a confederate who presented as a fellow participant and disclosed being diagnosed with bipolar disorder. After the interaction, participants completed measures of affective stigma toward the confederate. Behavioural stigma toward the confederate was measured by participants’ behavioral intentions to interact with the confederate in the future, the confederate’s impression rating of the participant, and naïve coders’ thin-slice coding of the interaction.

Results indicated that the EC condition led to improvements in some aspects of stigma toward a hypothetical person with bipolar disorder, and greater intentions to interact with the confederate. Importantly, knowledge of bipolar disorder, positivity toward others, and negativity
toward others were significant mediators through which EC impacted improvements in stigma
toward a hypothetical person with bipolar disorder. Although LKM did not reduce affective and
implicit stigma as expected, it was associated with greater intentions to interact with the
confederate. Moreover, higher positivity toward others due to LKM mediated positive outcome
in some aspects of stigma. Implications of findings for stigma interventions, as well as clinical
implications for individuals with mental illness and mental health care providers, are discussed.
Lay Summary

Stigma about mental illness is widely prevalent in our society. The negative impact of stigma on individuals with mental illness is significant. This study investigated the effect of education-contact (EC), a commonly used strategy, relative to loving-kindness meditation (LKM), a novel intervention, against a control condition on reducing cognitive, affective, and behavioural stigma toward the mental illness of bipolar disorder. The results showed that there was a significant impact of EC on reducing anger and increasing beliefs of intelligence toward a hypothetical person with bipolar disorder. Importantly, EC and LKM interventions both increased the likelihood of the participant interacting with a confederate who disclosed having a bipolar disorder diagnosis. The study also found that EC improved stigma of bipolar disorder through more knowledge about bipolar disorder, more positivity toward others, and less negativity toward others, whereas LKM reduced stigma through more positivity toward others. Clinical implications of these findings are discussed.
Preface

This study was approved by the UBC Behavioural Research Ethics Board (H18-02484). All of the work for this dissertation was conducted by myself (Jennifer Na) under the guidance of Dr. Amori Mikami, who is my supervisor and the principal investigator of the Peer Relationships in Childhood Lab. I designed the study and collected the data with the help of my research assistants (whom I trained on the research protocol). I conducted all data analysis and writing of the dissertation.
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List of Abbreviations

EC: Education-contact

LKM: Loving-kindness meditation
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Dedication

I dedicate my dissertation to my mom, Sooyeon Kim. All of my endeavours have been possible because of her sacrifices and courage.

Mom—your unconditional love, unwavering faith, and prayers have shaped me into the person I am today. You inspire me to be open-minded, curious, and brave. I love you.

이 박사논문을 저의 어머니에게 헌정 합니다. 엄마의 희생과 용기가 있었기에 이 모든 것이 가능했습니다. 엄마의 무조건적인 사랑과, 흔들리지 않는 믿음, 그리고 기도가 저를 지탱하고 오늘의 저를 있게 했습니다. 엄마에게서 열린 마음, 호기심과 용기를 배운 덕분에 이 박사학위와 제 삶이 풍요로울 수 있었습니다. 엄마 사랑해.
**Introduction**

Stigma, which is defined as a physical and bodily sign marking inferiority and bad moral character, is particularly relevant to mental illness (Goffman, 1963). Indeed, individuals with mental illness are often subjected to stigma associated with their condition and have been referred to as among the most marginalized members of society (Johnstone, 2001). Considerable literature suggests that experiencing stigma because of mental illness places someone at incrementally greater risk for adverse adjustment consequences, above and beyond the ramifications associated with the mental illness itself (Rüsch et al., 2005). For these reasons, the World Health Organization (2001) recognizes the negative impact of stigma on the quality of life of those with mental illness and considers stigma to be a global health problem.

Public stigma toward mental illness is conceptualized as the stereotypes and prejudice that society holds against individuals with mental health conditions and the discrimination that follows from these negative cognitions and attitudes (Hinshaw & Stier, 2008). Typically, discriminatory behaviours enacted against individuals with mental illness are expressed as increased social distance and loss of social opportunities (Corrigan, 1998). The consequences of public stigma are intensified when recipients internalize the stigma (i.e., self-stigma), resulting in distress, diminished self-esteem, and poorer social adjustment (Corrigan, 2004; Perlick et al., 2001; Wahl, 1999; Watson et al., 2007). Public and self-stigma may impede recipients’ treatment-seeking behaviour, worsen the course and outcome of treatment, reduce adherence to treatment, and increase the risk of relapse (Shrivastava et al., 2013). These types of stigma are perpetuated due to and embedded in a system of structural discrimination that is intentional (e.g., laws and media) and unintentional (e.g., policy that leads to less opportunities for individuals with mental illness; Corrigan et al., 2004). In sum, the negative impact of stigma and its sequelae
may be as harmful as the effects of the core symptoms of the mental illness itself (Corrigan & Penn, 2015).

Therefore, treating only the symptoms of mental illness is insufficient to improve quality of life among stigmatized individuals; societal change in reducing public stigma toward mental illness must also occur. Without the pervasiveness of public stigma, individuals with mental illness would be less likely to internalize stigma and experience the additional consequences associated with self-stigma. The burden of reducing the impact of stigma should not rest on those with mental illness, via attempts to minimize symptoms or self-stigma, but rather on society as a whole through fostering more nonjudgmental and compassionate attitudes toward mental illness.

The goal of the current study is to investigate the efficacy of a commonly used strategy (education-contact intervention; EC) relative to a novel approach (loving-kindness meditation; LKM), and a control condition, in reducing public stigma toward mental illness. The current study also examines mediators of potential intervention effects. In this Introduction section, I first summarize the different components of mental illness stigma, and then I present the theory and efficacy of the EC approach as an existing intervention to reduce mental illness stigma. Next, I present what I view as five key limitations of the existing research literature and the efficacy of stigma reduction strategies. This leads to a description of the novel approach of LKM, which I propose could potentially improve upon the efficacy of EC. I also explain how the current study was designed to address other methodological limitations. I conclude by explaining my choice of stigma toward bipolar disorder as the specific mental illness to be targeted, and present the study aims and hypotheses.

**Components of Mental Illness Stigma**

Public stigma toward mental illness is traditionally considered to be comprised of three
components: cognitive, affective, and behavioural stigma. Following the socio-cognitive model, the cognitive component of stigma is exemplified by stereotypic beliefs, the affective component by emotional responses, and the behavioural component by discriminatory behaviours (Byrne, 2000; Corrigan, 2000).

Cognitive stigma refers to agreement with stereotypic beliefs, or commonly acknowledged and overgeneralized assumptions about the attributes of those with mental illness. Assumptions about such individuals tend to have a common theme of incompetence, dangerousness, and blameworthiness (Corrigan et al., 2012; Crisp et al., 2000).

Affective stigma reflects the experience and expression of negative emotions toward individuals with mental illness due to their condition. Typical emotional reactions to those with mental illness are anger, fear, and pity (Angermeyer & Matschinger, 2003). Importantly, affective stigma may be associated with cognitive beliefs about mental illness. For example, assumptions of dangerousness may evoke fear; whereas assumptions that people with mental illness are to blame for their condition may elicit anger (Corrigan et al., 2003).

Lastly, behavioural stigma, also sometimes described as discrimination, consists of unfair or differential treatment of those with mental illness due to their condition. Discriminatory behaviours pertinent to mental illness stigma include social distance, unfair employment and housing decisions, and coercion into treatment (Corrigan et al., 2003; Krupa et al., 2009). These behaviours may be elicited by stereotypic beliefs (cognitive stigma) and emotional responses to mental illness (affective stigma). I note, however, that measurement of actual discriminatory behaviours in research, particularly using observational methods, have been scant. Instead, self-reported intentions to engage in behaviours (usually directed toward a hypothetical target with mental illness or nonspecific “persons with mental illness” in general) are nearly always used as
proxies for assessing behavioural stigma. In the current study, I use the term “behavioural stigma” to refer to real-life, observed discriminatory behaviours toward those with mental illness. In contrast, the term “behavioural intentions” refers to self-reported intentions to engage in a certain behaviour toward someone with mental illness (and I distinguish between whether behavioural intentions are directed toward a hypothetical target with mental illness, relative to a real-life, actual person with mental illness).

As the cognitive, affective, and behavioural components of stigma are distinct but closely intertwined, measuring all three components is crucial when assessing the efficacy of stigma reduction interventions. Moreover, understanding how each component of stigma may contribute to change in the other components may provide insight into where to direct intervention efforts.

**Mental Illness Stigma Interventions**

To date, the most commonly implemented interventions to reduce public stigma toward mental illness are education, contact, and the combination of education and contact approaches (referred to as EC), as reviewed in Corrigan et al. (2012). Below, I describe these existing interventions, the theory behind them, and their empirical support. The EC approach will later be contrasted with the LKM approach consisting of loving-kindness meditation as a novel strategy for reducing stigma toward mental illness.

**Education Intervention**

Education approaches aim to increase recipients’ knowledge about mental illness by replacing stereotypic beliefs and dispelling misconceptions with information based on scientific evidence (Watson et al., 2004). This intervention approach is based on a cognitive model of stereotype change, which holds that disconfirming information is needed to modify beliefs about the outgroup (Tan et al., 2001). Within the literature, some debate exists regarding how people
process disconfirming information. The bookkeeping model posits that stereotype change results from incrementally gathered disconfirming information, whereas the conversion model argues that stereotype change occurs when a threshold of disconfirming information has been reached (Rothbart, 1981). Further, the subtyping model asserts that the degree of stereotypicality of the information is crucial; only moderately counterstereotypic information is processed as disconfirming evidence that influences stereotype change, as highly counterstereotypic individuals are likely to be categorized as a separate subgroup (Taylor, 1981). These cognitive models provide a theoretical basis for education interventions and also inform how disconfirming information might be presented to maximally result in stigma reduction.

Existing educational interventions addressing mental illness stigma typically focus on disseminating knowledge about the causes, treatment, prognosis, and recognition of disorders. Interventions are delivered through books, videos, workshops and may target many recipients at once (Rüşch et al., 2005). Within education interventions, some types of knowledge may have more potential for reducing public stigma relative to other types of knowledge. The research addressing this question has mostly involved the associations between beliefs about the causes of mental illness and attitudes toward those with mental illness. Specifically, psychosocial explanations for the cause of mental illness are more likely to be correlated with positive behaviours or behavioural intentions toward mental illness than are biological explanations. For example, when participants believed that their partner in the study had a mental illness which was due to biological reasons (e.g., chemical imbalance), this was associated with greater harshness of shocks administered to their partner; by contrast, participants who believed a psychosocial explanation for their partner’s mental illness did not differ from those who believed their partner had no history of mental illness in the harshness of shocks they administered (Mehta
Similarly, participants who endorsed biological causes for schizophrenia and depression demonstrated higher desire for social distance toward individuals with these conditions, compared to those who endorsed psychological causes (Dietrich et al., 2004). Thus, it is possible that education interventions may be more effective in reducing stigma when the explanation provided for the onset of a mental illness focuses on the interaction between psychosocial and biological causes (as opposed to offering exclusively biological explanations).

**Contact Intervention**

Contact approaches attempt to reduce stigma toward mental illness by creating opportunities for in-vivo, video, or imaginal contact with individuals who have mental illness. This intervention approach is based on the theory that increased familiarity with people who have mental illness leads to recipients having more accurate knowledge about mental illness, as well as reduced anxiety and more empathy toward people with mental illness (Angermeyer et al., 2004). Like psychoeducation, contact is meant to correct negative stereotypes and misinformation, but with the thought that having a personalized positive experience with someone who has mental illness might facilitate changing recipients’ attitudes and beliefs (e.g., Voci & Hewstone, 2003).

In support of the theory behind contact as a stigma reduction intervention, a well-established body of research demonstrates that intergroup contact in general is associated with less intergroup prejudice across a broad range of outgroup targets and contact settings, a finding that also extends to attitudes toward mental illness (Pettigrew & Tropp, 2006). For example, studies have found that participants’ reports of previous contact with someone who has mental illness are also associated with their reports of feeling less negative emotion, social distance, and stereotypic beliefs toward those with mental illness in general (Couture & Penn, 2003).
Importantly, this appears to occur regardless of whether the previous contact was voluntary or involuntary (Link & Cullen, 1986). Pertinent to the mechanisms behind this effect, contact and familiarity with outgroup members in general have been found to relate to lower intergroup prejudice through the mediators of enhanced knowledge about the outgroup and reduced anxiety and more empathy toward the outgroup; however, the mediational effect of increased knowledge may be less robust than that of reduced anxiety and increased empathy (Pettigrew & Tropp, 2008). Although these mediators are established in the intergroup contact literature, their roles as mediators for reducing stigma of mental illness have not been specifically tested. Based on evidence that affective mediators (i.e., anxiety and empathy) play a more critical role than the cognitive mediator (i.e., improved knowledge) for reducing prejudice toward an outgroup in general, the same pattern may apply to reducing mental illness stigma.

Contact interventions typically create opportunities where participants and individuals with mental illness can interact in a positive and meaningful manner. This has been implemented in a variety of ways. Some contact interventions include a structured panel or workshop where someone with mental illness speaks about their experience (Kosyluk et al., 2016), or through a theatrical performance (Michalak et al., 2014). Contact has also been employed by having participants watch video footage of someone discussing personal experiences with a mental illness, or by reading someone’s written description of personal experiences (Thonon et al., 2016). Imagined contact, a strategy where participants imagine interacting with an individual with mental illness described in a vignette, has also been used as an intervention to improve positive attitudes toward those with mental illness (Na & Chasteen, 2016; West et al., 2011).

**Combined Education-Contact Intervention**

Combining education and contact approaches may be sensible for several reasons. First,
these two approaches share the primary goal of increasing recipients’ knowledge about outgroup members. Contact interventions emphasize learning about mental illness directly from an individual with mental illness, whereas education interventions provide similar information in a more objective and information-focused manner. However, both strive to correct misconceptions about mental illness. Second, as discussed below, education and contact approaches have the most empirical support for reducing stigma toward mental illness to date (despite what I view as some crucial limitations in the efficacy of these interventions). In fact, more contact-based education interventions ($k = 78$) were identified compared to pure contact studies ($k = 20$) in a recent meta-analysis of contact interventions for mental illness stigma (Maunder & White, 2019), exemplifying the extent to which combining education and contact approaches is an established technique. Another potential benefit of combining the two approaches is that the contact component may also invoke stronger affective changes (in addition to cognitive changes) regarding stigma, because of the personalized experience with someone who has mental illness. I elaborate on this idea below.

The order in which components are administered may matter in EC interventions which combine the two approaches (Ellison, Mason, & Scior, 2015). In a school-based intervention for high school students, greater reductions in stigmatizing attitudes, social distance, and knowledge, were found when the education component preceded the contact video. When the contact video was shown before the education component, the magnitude of change was not significantly different from the education-alone condition (Ellison, Mason, & Scior, 2015). The authors hypothesized that the education component may provide background that facilitates processing of the contact video.

**Efficacy of Education and Contact Interventions**
Substantial evidence suggests that both education and contact interventions (as well as EC, the combination of the two) demonstrate some effect on reducing stigma of mental illness - at least as measured by participants’ explicit self-reports about their cognitions, emotions, and behavioural intentions toward a hypothetical target with mental illness described in a vignette or toward nonspecific “persons with mental illness” in general. Notably, these interventions have been shown to be efficacious regardless of the medium through which they were delivered. Participants in an education program, both in person and via film, reported significant improvements in beliefs about responsibility (Angermeyer & Dietrich, 2006). Moreover, an online-based website intervention also demonstrated significant reductions in stigma toward depression and improvements in knowledge about depression, relative to the control condition (Griffiths et al., 2004). A study by Bannatyne and Stapleton (2015) found that two types of education interventions (biogenetic or multifactorial explanations for anorexia nervosa) led to significant reductions in participants’ self-reported stigma and unfavourable attributions (e.g., blame, responsibility) compared to the control condition at post-intervention as well as 8-week follow-up. Moreover, there is evidence to suggest that education interventions can successfully reduce mental illness stigma and increase knowledge about mental illness in middle school youths in grades 6-8 (Watson et al., 2004).

Likewise, contact interventions, both in-vivo and videotaped, have led to improved behavioural intentions (e.g., less desire for social distance) toward nonspecific persons with severe mental illness in general (Penn et al., 1994), as well as decreases in participants’ beliefs about the dangerousness of mental illness (Alexander & Link, 2009). Desforges et al. (1991) demonstrated that among participants who initially endorsed negative attitudes toward a confederate with a history of mental illness, those randomly assigned to engage in a structured
cooperative task with the confederate reported more positive impressions of the confederate and more positive attitude toward persons with mental illness in general than participants who were in the control condition (i.e., studying in the same room). In addition, participants randomly assigned to attend a presentation and discussion with an individual with mental illness endorsed more positive attributions about controllability and stability of depression compared to those who were exposed to protest materials (i.e., condemnation against disrespectful media representation of mental illness; Corrigan et al., 2001). Finally, mental health professionals who were randomly assigned to receive a component of their training from an individual with mental illness endorsed more positive attitudes (e.g., nonstigmatizing beliefs) toward mental illness compared to those who received training from another mental health professional (Cook et al., 1995). In a recent meta-analysis summarizing this literature about contact approaches, Maunder and White (2019) found that the overall immediate effect of contact on mental illness stigma was small to medium in size (k = 97; d = -0.38). Specifically, they found significant effects on explicit attitudes, affective bias, behavioural intentions, and prejudice, but not on implicit bias or behaviour. They also did not find any differences in the efficacy of contact delivered via different mediums (i.e., face-to-face, imagined, video, presentation; Maunder & White, 2019).

Meta-analytic findings of intervention studies to reduce stigma of mental illness summarize the overall efficacy of education and contact interventions, which comprise the vast majority of the existing and included research, as noted above (Corrigan et al., 2012; Griffiths et al., 2014). To date, two meta-analyses have concluded that the effect sizes for these mental illness stigma interventions are significant; nonetheless, they are small in size (Corrigan et al., 2012; Griffiths et al., 2014) and these effects may diminish at follow up (Corrigan et al., 2015). A recently updated meta-analyses (Na et al., in preparation) employed more rigorous selection
criteria for studies (e.g., only included controlled studies with baseline stigma data). Separate meta-analyses were conducted for each of the components of mental illness stigma to examine the effects of interventions on cognitive stigma, affective stigma, and behavioural intentions individually (Na et al., in preparation). None of the identified studies in this meta-analysis measured actual behavioural stigma as an outcome measure (only behavioural intentions). The pooled effect of interventions on cognitive stigma was small and significant at post-intervention ($g = .30$) and at follow-up ($g = .31$). A medium effect size was calculated for behavioural intentions at post-intervention ($g = .54$); this effect was reduced to small at follow-up ($g = .41$). For affective stigma, the pooled effect size was small and significant at post-intervention ($g = .26$) but was no longer significant at follow-up ($g = .20$). This non-significant effect may have been due to a limited number of studies which reported follow-up outcomes for affective stigma ($k = 6$). The pattern of smaller effect sizes at follow-up suggests that the intervention effects weaken over time; this was also found by Corrigan and colleagues (2015) in their meta-analysis of follow-up studies.

Interestingly, contact versus education versus combined EC interventions were not statistically different in reducing cognitive stigma and behavioural intentions toward hypothetical or nonspecific persons with mental illness in the meta-analysis (Na et al., in preparation). There were not enough studies examining alternative approaches to draw meaningful conclusions about interventions other than education, contact, or their combination. However, results from individual studies suggest some potential distinctions between these approaches. A study that examined both education and contact interventions found that participants who viewed an education videotape showed improvement in beliefs associated with responsibility (e.g., individuals with mental illness are not to be blamed for their symptoms), whereas those who
viewed a contact videotape showed improvements in terms of lower behavioural intentions of coercion and segregation and lower pity toward nonspecific people with mental illness in general (Corrigan et al., 2006). This finding provides some empirical support that these two intervention approaches may change distinct components of stigma (i.e., cognitive, affective, and behavioural) and suggests that combining education and contact strategies may lead to additive effects on stigma reduction (Corrigan et al., 2006).

Collectively, the strongest empirical evidence exists for education and contact interventions (and EC, representing their combination) as efficacious for mental illness stigma reduction. These approaches lead to medium to small improvements in all three components of stigma in the short-term and small improvements in cognitive stigma and behavioural intentions in the longer-term toward individuals with mental illness, when outcomes are self-reported on explicit measures involving a hypothetical person with mental illness in a vignette or toward nonspecific “persons with mental illness” in general. In the current study, I test a combined EC intervention condition designed to include the components of each approach with the most empirical support for reducing stigma of mental illness. Although the existing literature does suggest some meaningful improvements in stigma that likely result from education and contact approaches, nonetheless, findings also highlight room to improve the efficacy of stigma reduction interventions. I note that the novel approach of LKM is proposed to potentially improve the efficacy of EC in some important ways. In the next section, I discuss what I view as each of the main limitations of existing research. The current study also attempts to address all of these limitations.

Limitations of Existing Research

The following limitations, in my view, characterize existing research on interventions to
reduce mental illness stigma. First, the measurement of affective stigma (relative to cognitive stigma and behavioural intentions) is scarce despite it being one of the three core components of stigma. Second, and relatedly, our field can benefit from better understanding and careful testing of the order in which the three stigma components change as a result of interventions. Third, despite theory regarding the mechanisms through which education and contact interventions may reduce stigma, most studies have neglected to empirically test these mechanisms. Fourth, changes in participants’ actual behaviours and behavioural intentions toward real-life people with mental illness are rarely measured; rather, studies nearly exclusively assess participants’ self-reported behavioural intentions toward a hypothetical target in a vignette or toward nonspecific individuals with mental illness in general (and not an actual, real-life individual) as outcome variables. Fifth, how interventions affect mental illness stigma that is measured implicitly, as opposed to by explicit self-report, is largely missing in the literature to date. Below, I elaborate on each limitation.

**Failure to Address Affective Stigma**

The vast majority of stigma intervention studies have examined changes in participants’ cognitive stigma and behavioural intentions toward those with mental illness but have neglected to examine changes in affective stigma (the emotional response toward individuals with mental illness). The meta-analysis by Na et al. (in preparation) reported that only eight (of 41) included studies reported whether their intervention resulted in changes in emotional reactions toward mental illness. The pooled effect sizes indicated that the interventions were efficacious in reducing affective stigma ($k = 8; g = .26$) immediately after the intervention, however, unlike cognitive stigma and behavioural intentions, the effects were no longer significant at follow-up ($k = 6; g = .20, p = .15$; Na et al., in preparation). By contrast, 36 studies included outcome
measures of cognitive stigma and 26 studies included outcome measures of behavioural intentions (Na et al., in preparation).

Na et al. (in preparation) updated the previous meta-analysis done by Corrigan et al. (2012), using recent studies and more stringent inclusion criteria. However, notably, Corrigan et al. (2012) pooled only 41 effect sizes for affective stigma (relative to 373 for cognitive stigma and 193 for behavioural intentions). Corrigan et al. (2012) also found that contact interventions did not yield significant improvements in affective stigma ($k = 17; d = -.03$), although education interventions led to significant but small reductions in affective stigma ($k = 24; d = .14$). The estimated effect size in Corrigan et al. (2012) is likely to be inflated due to including multiple effect sizes from the same study. Regardless, the vast difference in the number of effect sizes entered for cognitive stigma and behavioural intentions compared to affective stigma highlights the scarcity of assessment of affective stigma in comparison to assessment of the other stigma components. Additionally, it raises doubts about whether existing interventions effectively reduce the affective component of stigma.

I argue that researchers need to consistently measure affective stigma as an outcome variable, as well as potentially design interventions to more directly target affective stigma. In addition to the fact that affective stigma is one of the three core components of stigma (Corrigan et al., 2012), there is reason to believe that reducing affective stigma will most strongly lead to lowering behavioural stigma, which is the ultimate aim for anti-stigma interventions. In the case of racial bias, a meta-analysis demonstrated that emotional prejudices were two times more closely related to discriminatory behaviours than were stereotypic beliefs (Talaska et al., 2008). In addition, emotional prejudices were linked to both observed and self-reported discrimination, whereas stereotypic beliefs were related to only self-reported discrimination or behavioural
intentions (Talaska et al., 2008). These findings highlight the importance of emotions for influencing behaviour and suggest that while cognitive and affective stigma both relate to people’s report of what they say they have done or will do (i.e., behavioural intentions), affective stigma is more closely related to people’s actual behaviours (i.e., behavioural stigma) than is cognitive stigma (Talaska et al., 2008). In fact, the necessity for engaging emotions rather than cognitions to reduce stigma has been identified in a review of school-based interventions for mental illness (Schachter et al., 2008). Thus, reductions in affective stigma toward mental illness may be most useful for effecting lasting changes in behavioural stigma.

It is possible that EC intervention approaches are useful in targeting stigmatizing beliefs, but do not sufficiently address the negative and difficult feelings elicited (e.g., discomfort and anxiety) when presented with an opportunity to interact with or think about a person with mental illness. Thus, an intervention strategy that aims to target these emotional responses specifically may be needed to address affective stigma toward mental illness. In the current study, I propose that LKM, or loving-kindness meditation, may be a viable strategy for increasing empathy and positive regard for others, thereby representing a novel approach to reducing affective stigma in particular.

LKM may effect change in stigma through a different route than currently available intervention options. EC interventions for mental illness have primarily targeted the cognitive route of reducing stigma via augmenting knowledge and understanding about mental illness. Although contact interventions are theorized to improve attitudes toward mental illness in part via reductions in anxiety and fear, increase in knowledge is also a proposed mediator and a key component of contact studies (Pettigrew & Tropp, 2008). Moreover, the pooled effect size for contact interventions suggests that this approach may not be successful in reducing affective
stigma (Corrigan et al., 2012). Contact interventions are often purposefully designed to be informative experiences for participants; thus, this approach likely relies heavily on disseminating knowledge-based information about mental illness as much as an education intervention.

In comparison, LKM is a technique aimed to foster an affective state of kindness toward the self and others. LKM has been linked with positive outcomes in social cognitions and prosocial behaviours toward outgroup members (Stell & Farsides, 2015), making it a potentially suitable strategy to reduce stigma toward mental illnesses. The LKM approach may allow for processing of relevant information and emotions through a different route, which might be more efficacious in targeting affective components of stigma. The potential of LKM as an intervention to reduce stigma of mental illness will be elaborated further in the sections below.

**Unknown Order of Change in Stigma Components**

Related to our limited understanding of affective stigma, the order in which the three components of stigma influence one another (or change, as a result of intervention) is largely unclear. However, understanding the potential inter-relatedness between cognitive, affective, and behavioural stigma may improve intervention efficacy, by suggesting the targets for intervention that are most likely to start ripple effects to potentially change other stigma components.

Attribution theory and intergroup contact theory each propose a different process for the order of change in the three stigma components. Attribution theory explains stigmatization via a cognitive-emotional process, whereby attributional beliefs related to controllability and responsibility (cognitive stigma) are theorized to cause emotional reactions such as anger or pity (affective stigma), which then affect behavioural intentions toward a hypothetical target with mental illness (Corrigan et al., 2003). Support for the attribution model comes from empirical
studies manipulating participants’ beliefs about controllability of the cause of a hypothetical individual’s mental illness and the dangerousness of this hypothetical individual, and then measuring emotional reactions and behavioural intentions toward the hypothetical individual. These studies found that when participants were provided with information that the mental illness was under the hypothetical person’s control, they responded with less pity and more anger, and ultimately were less inclined to help this person. Moreover, when participants believed that the hypothetical target individual with mental illness was dangerous, this led to feelings of increased fear, which then predicted behavioural intentions to avoid the person with mental illness or to support coercive treatment for this person (Corrigan et al., 2003). Thus, the attribution model suggests that changes in stereotypic beliefs may precede changes in affect, which ultimately result in changes in behavioural intentions.

In contrast, intergroup contact theory posits that emotional responses to a hypothetical target with mental illness (affective stigma), precede stereotypic beliefs (cognitive stigma), which then result in behavioural intentions. Interestingly, a few studies find support for the pathway of affective stigma preceding cognitive stigma, relative to vice versa. Aberson and Haag (2016) validated the fit of a model wherein reduction of anxiety led to lower levels of stereotype endorsement and more positive explicit attitudes toward an outgroup, as opposed to vice versa. The authors posited that this finding might be due to the effect of anxiety on narrowing attention and increasing reliance on stereotypes for judgments. Specific to mental illness stigma, Na and Chasteen (2016) examined the impact of imagined contact on reducing stigma toward depression and compared two possible pathways. Between a model with affective stigma (e.g., increase in positivity) as the mediator and cognitive stigma (e.g., stereotypic beliefs) as the outcome variable and an alternative model with cognitive stigma as the mediator and affective stigma as the
outcome, the former model had better statistical fit than the latter model. In other words, imagined contact was suggested to reduce cognitive stigma through reduction in affective stigma, rather than vice versa.

As expected, studies have also demonstrated that reductions in affective stigma precede changes in behavioural intentions following intergroup contact. A longitudinal study demonstrated that for individuals of the ethnic majority group, intergroup anxiety mediated the effect of intergroup contact on desire to enter into a social relationship with a nonspecific member of the outgroup (Binder et al., 2009). In a cross-sectional study, affective stigma mediated the effect of imagined contact with an individual with schizophrenia on behavioural intentions toward persons with schizophrenia in general (Stathi et al., 2012). These studies signify that changes in affective stigma likely precede changes in behavioural intentions; however, these results would be consistent with both attribution theory and the intergroup contact model, both of which assume that affective (and cognitive) stigma precede behavioural intentions toward hypothetical individuals or nonspecific people with mental illness in general.

Thus, while the attribution and intergroup contact theories agree that changes in behavioural intentions may result from changes in cognitive and affective stigma, whether changes in cognitive stigma precede changes in affective stigma, or vice versa, differs between these theories. In the current study, I attempt to advance existing literature by testing the order of change in the three core stigma components that may result from EC intervention.

**Omission of Mediator Testing**

Most studies investigating the efficacy of anti-stigma interventions have neglected to propose and test the core mechanisms through which the intervention may result in reduced stigma. Crucially, this type of mediator testing is needed to improve the theoretical
understanding of the factors that mitigate mental illness stigma, as well as the reasons why some interventions are more efficacious than others.

For education interventions, increase in knowledge about mental illness is a plausible mediator of effects on stigma reduction, based on the theory behind this intervention approach. Indeed, lack of knowledge has been associated with greater negative attitudes toward mental illness (Wolff et al., 1996), and education interventions attempt to directly teach knowledge in order to dismantle stereotypes. Yet, among the 30 controlled studies testing the efficacies of education and the combined EC intervention included in the recent meta-analyses by Na et al. (in preparation), only two examined increase in knowledge of mental illness as a mediator of the effects of intervention on reduction in stigma outcome. Further, the available empirical findings are mixed regarding whether increased knowledge does in fact mediate education intervention effects. Milin et al. (2016) found that for each unit increase in mental health knowledge score following an education intervention, there was a corresponding increase in positive attitudes toward mental illness. In contrast, Griffiths et al. (2004) concluded that the change in depression literacy did not mediate stigma reduction associated with receipt of an educational intervention. Interestingly, a number of studies have examined knowledge about mental illness as an outcome measure rather than a mediator (e.g., Clement et al., 2012; Dimoff et al., 2016; Finkelstein et al., 2008; Jones et al., 2014; Kiropoulos et al., 2011; Li et al., 2015; Perry et al., 2014). These studies generally find that education interventions result in greater knowledge, but do not assess whether this knowledge is in turn associated with reduced stigma toward mental illness.

Examination of mediators has been even more scarce among contact interventions targeting stigma of mental illness. Based on intergroup contact literature, increases in empathy, decreases in intergroup anxiety, and improved knowledge should be viable mediators for the
effects of contact interventions on reduced mental illness stigma (Pettigrew & Tropp, 2008). In two cross-sectional studies conducted with undergraduate and online adult samples, Na and Chasteen (2016) found that imagined contact reduced stereotyping of an individual with depression through increased positive emotions toward the individual, which provides some empirical support for this mediational pathway. Unfortunately, based on a review of the 17 controlled studies examining the effect of contact-based and combined EC interventions included in the meta-analysis by Na et al. (in preparation), none of the studies explored mediators of the effects.

The finding that contact versus education versus EC interventions were not statistically different in reducing cognitive stigma or behavioural intentions (toward hypothetical targets or nonspecific persons with mental illness in general) also calls for further investigation of mechanisms behind each intervention approach (Na et al., in preparation). It is unclear whether any of these approaches have actually affected their putative mediators (and relatedly, whether EC interventions have effectively targeted putative mediators for both education and contact). In turn, it is additionally unknown whether change in putative mediators as a consequence of intervention has led to reduction of stigma. In the current study, I test the efficacy of a combined EC intervention on reducing stigma of mental illness, as well as potential mediators of any effects. Overall, to understand the reasons for efficacy (or lack of efficacy) of interventions on reducing stigma of mental illness, examination of mediational pathways is crucial to first determine whether the interventions are changing the putative mediators. If an intervention targets increased knowledge in participants, for example, and this target is achieved but decreases in stigma do not follow, then perhaps a different target of intervention should be chosen instead of knowledge. However, if the intervention is unsuccessful in affecting
knowledge (despite this being a goal), and decreases in stigma are not evident, then it is possible that new intervention approaches should be considered that better change knowledge.

*Lack of Measurement of Actual Behavioural Stigma*

Another limitation in the current literature is that almost all studies rely upon explicit, self-report measures of behavioural intentions toward hypothetical targets with mental illness in a vignette or nonspecific “people with mental illness” in general, as opposed to actual discriminatory behaviours or behavioural intentions toward identified, real-life members of this group (Corrigan et al., 2012; Mehta et al., 2015). A meta-analysis of intergroup contact studies targeting mental illness stigma identified only 5 studies (out of 100) which measured actual behaviour toward someone with mental illness, and found that the overall effect size on this outcome variable was nonsignificant (Maunder & White, 2019).

This is a significant oversight, given that reducing real-life discriminatory behaviours toward those with mental illness is the ultimate goal of anti-stigma efforts. Whether behavioural intentions measured in stigma reduction studies are linked to actual, real-life behavioural changes is an empirical question that is mainly unanswered to date. In the current study, to evaluate intervention efficacy, I obtained behavioural measures (behavioural stigma and behavioural intentions) through observation coding of an interaction with a real-life confederate who self-discloses having a mental illness.

*Scarcity of Measurement of Implicit Stigma*

In contrast to the evidence for intervention effects on stigma toward mental illness as measured via explicit, self-report measures, there is much poorer understanding of how existing interventions influence evaluations or expressions of bias that are automatically activated without one’s awareness or control, also known as implicit stigma (Greenwald & Banaji, 1995;
Explicit, self-report measures have been criticized for being subject to demand characteristics and impression management (Greenwald et al., 2002), which may influence individuals to respond more positively to questions assessing their stigmatizing attitudes toward mental illness. In addition to possibly resulting in biased responses, another limitation of explicit measures is that they may not reflect all levels of attitude change (Stier & Hinshaw, 2007), which may inadequately capture potential intervention efficacy.

Implicit and explicit stigma of mental illness have been found to be unrelated to each other, which suggests the independence of the two constructs (Teachman & Wilson, 2006). Crucially, implicit measures have been conceptualized to better reflect affective, rather than cognitive judgments (Hofmann, 2005). Together, these findings imply that implicit measures may capture a different component of stigma compared to explicit measures, potentially better tapping the affective than cognitive aspect of stigma. Importantly, implicit biases have been linked to behavioural intentions; more implicit bias in mental health workers was associated with lower willingness to help someone with mental illness (Brener, Rose, von Hippel, & Wilson, 2013b).

Notably, the evidence for contact and education strategies on reduction of implicit stigma is not promising. Lincoln, Arens, Berger and Rief (2008) found that an education intervention did not mitigate implicit stigma, even though it decreased aspects of explicitly reported cognitive stigma and stated desire for social distance toward persons with schizophrenia in general. Implicit stigma also remained unchanged among students who completed 1 month of psychiatric clerkship (Wang et al., 2015). Although the psychiatric clerkship was not designed as an anti-stigma intervention, it included aspects of contact and education that someone might be exposed to in an EC intervention. Based on the limited evidence to date, contact and education strategies
appear to be ineffective in reducing implicit stigma of mental illness.

In the current study, I assessed intervention effects on implicit stigma as well as on explicit stigma. I further tested whether the alternative strategy of LKM may not only better target affective stigma relative to existing education and/or contact approaches, but also better impact implicit stigma. In the next section, I elaborate on why LKM might be a feasible strategy for reducing affective stigma as well as implicit stigma, and present evidence for its efficacy as a prejudice reduction strategy.

**Loving-kindness Meditation Practice as a Novel Stigma Reduction Strategy**

In recent years, mindfulness meditation has been investigated as a viable strategy for improving intergroup relationships and reducing prejudice against outgroups. Mindfulness is defined as the state of being attentive to and aware of the present reality and current experience. In a state of mindfulness, a person’s open and receptive attention and awareness is directed toward both inner states and the outside world, in a non-judgmental and non-evaluative manner (Brown & Ryan, 2003; Brown et al., 2007). Thus, mindfulness practice may potentially engender a non-judgmental awareness and acceptance of negative emotions and thoughts in reaction to an individual with mental illness. Below, I discuss a type of mindfulness practice, LKM, that I believe has the most potential as an alternative intervention approach to reduce stigma toward mental illness.

Among many mindfulness practices, LKM has been the most tested practice for reducing bias and prejudice toward an outgroup because it contains explicit instructions to engender positive affect and to direct it toward others (Price-Blackshear et al., 2017). In similar ways in which LKM improves social connectedness and intergroup relationships, it may potentially also reduce stigma toward mental illness. As with all mindfulness meditations, LKM is grounded in
nonjudgmental, accepting, and non-evaluative orientation toward the present moment (Salzberg, 1995). However, in comparison to other mindfulness meditations, LKM explicitly guides meditators in directing compassion and well-wishes toward the self and toward real or imagined others to elicit changes in behaviour toward the self and others (Salzberg, 1995). Specifically, LKM practice begins with establishing loving-kindness toward the self, then intentionally expanding the field of loving-kindness to someone for whom the participant naturally harbours positive feelings. Then, the practice extends to someone with whom the participant’s relationship is more neutral (or to a stranger). Finally, the field of loving-kindness is expanded to include all beings of the universe, including someone with whom the participant might have a conflictual or difficult relationship. The purpose of extending loving-kindness to a “difficult” person is not to attempt to forgive or mend the relationship with this person but to recognize this person’s humanness, including the person’s suffering and desire for happiness (Kabat-Zinn, 2017).

Based on the theoretical and intended benefits, LKM may be a feasible strategy for reducing stigma toward mental illness, via increases in emotional positivity toward other people in general (e.g., compassion and empathy) and decreases in negativity toward others. Notably, a correlational study found that experienced compassion-based meditators expressed less racial prejudice compared to those with no experience with meditation, and that this relationship was mediated by the experienced meditators having more empathy (Hunsinger et al., 2012). Those with mental illness are often perceived as being “difficult” by society, such that people may rarely expand compassion to them under typical circumstances. Thus, a compassion-based meditation such as LKM, may have promise for increasing empathy and reducing stigma toward individuals with mental illness. LKM may reduce stigma through a predominantly affective route, which is in contrast to education and/or contact interventions, where the dominant route of
change may be cognitive-focused. In this study I explored whether LKM, through increasing positivity and decreasing negativity toward other people in general, would lead to reductions in affective stigma and ultimately in behavioural stigma, including more favourable behavioural intentions, toward individuals with mental illness.

**Mechanisms of LKM**

If LKM does indeed reduce stigma toward mental illness, this may occur via the mechanism of participants experiencing more positive emotions (e.g., love, contentment, calm, joy, gratitude, hope, pride, interest, amusement, awe) and less negative emotions toward others (Carson et al., 2005; Fredrickson et al., 2008; Salzberg, 1995). Experimental research offers some support for the link between LKM and such emotional changes that contribute to more favourable evaluation of others. Hutcherson et al. (2008) found that participants randomly assigned to follow a guided LKM in a laboratory endorsed perceiving themselves to be more similar to and feeling more connected to a neutral stranger who was not targeted in the meditation compared to the control group; this effect was partially mediated by increased positive emotion after LKM. Moreover, Fredrickson et al. (2008) found that increases in positive emotions following a 9-week LKM training were associated with participants reporting more social connectedness with others.

With regards to negative emotions, a controlled pilot study conducted with individuals with chronic back pain examined the effect of eight weekly, 90-minute sessions of LKM practice and education on anger. Patients who practiced LKM longer were less angry the following day (Carson et al., 2005). Although this study targeted a population with chronic pain, the finding suggests benefits of LKM on reducing negative affect, such as anger, which is a common emotion felt toward those with mental illness. In contrast, however, Fredrickson et al. (2008) did
not observe improvements in negative emotions following LKM.

Neuroimaging studies also provide some support for LKM's effect on emotion regulation. One study found that LKM practice was associated with activity in the caudate and the lateral prefrontal cortex, which play a role in efficient and voluntary emotion regulation (Lee et al., 2012). This association between LKM and adaptive emotion regulation potentially suggests that LKM may be a worthwhile strategy to explore for reducing maladaptive emotions.

In summary, although scarce, there is some evidence to suggest that LKM may lead to adaptive regulation of emotion; specifically, increases in positive emotions which are conducive to improved intergroup relationships, such as compassion, and decreases in negative emotions underlying prejudice, such as anger. Potentially, these effects may apply to participants’ perceptions of and interactions with individuals who have mental illness, as this is a group that is often considered to be “difficult” regarding the establishment of positive relationships. If reduction of negative affect toward others could be achieved by LKM, this would be especially pertinent for changing affective stigma toward mental illness, as anger and anxiety are often elicited in response to individuals with this condition (Reavley et al., 2016). Notably, although the practice of LKM explicitly aims to promote positive feelings and decrease negative feelings toward both the self and others (Salzberg, 1995), the aforementioned studies did not pinpoint the target of emotional changes resulting from LKM; rather, participants’ emotional experiences were assessed generally. In this study, I differentiate between emotions toward the self versus others that may result from LKM, for a more nuanced understanding of the effect of LKM on emotional experiences and potentially, stigma reduction.

Evidence for LKM on Improving Explicit Biases

Some studies have experimentally tested LKM as a potential strategy for reducing both
explicit biases toward stigmatized outgroups (e.g., people who are homeless, Black people). Parks, Birtel and Crisp (2014) found that participants assigned to an 8-minute LKM exercise endorsed reduced intergroup anxiety, more positive explicit attitudes, and higher intentions for future contact toward people who are homeless compared to those who were not assigned to engage in the LKM exercise. Furthermore, they found that the effects of LKM on intentions for future contact were mediated by more positive attitudes and lower anxiety about future contact (Parks et al., 2014). Importantly, this study demonstrates that LKM can reduce explicit negative attitudes toward an outgroup target even when that outgroup target is not mentioned directly in the meditation exercise. In another study, participants in the LKM group engaged in an 11-minute LKM practice of directing love toward their loved ones and a neutral stranger shown to them on a screen. Compared to the control condition, the participants in LKM group self-reported perceiving the strangers who were not targeted in the meditation practice more positively and this effect was mediated by increases in positive mood (Hutcherson et al., 2008).

Thus, there is some evidence to suggest that LKM may potentially lead to improvements in explicit stigma toward an outgroup (e.g., those with mental illness) even without targeting that outgroup directly in the meditation, via increases in positive mood. Nonetheless, a limitation of this literature is that LKM has not been specifically tested on stigma toward mental illness. It is possible that stigma toward mental illness is not equivalent with bias toward other groups (e.g., people who are homeless, Black people), or LKM may operate differently on participants’ perceptions of a target with mental illness compared to participants’ feelings about a neutral stranger.

Evidence for LKM on Improving Implicit Biases

There is also some evidence for LKM improving implicit attitudes toward others. In an
experimental study, participants randomized to engage in a 7-minute LKM exercise, which included 3 minutes of LKM directed specifically toward a Black person in a photograph, displayed lower implicit bias toward Black people afterwards compared to the control group (Stell & Farsides, 2015). Likewise, Hutcherson et al., (2008) found that LKM led to more positive implicit evaluations of the stranger targeted in the meditation; however, this pattern was not found for implicit evaluations of strangers who were not targeted in the meditation. Interestingly, Kang et al. (2014) found that 6 weeks of LKM discussion and practice of extending loving-kindness to all beings, compared to a LKM discussion group alone, significantly decreased implicit bias toward Black people and homeless people, but did not influence explicit bias toward these outgroups. Although the duration of LKM practice was substantially longer than in the aforementioned studies, this result suggests that under some conditions, LKM may lead to improved implicit attitudes toward a social group even when loving-kindness is not directed specifically toward this group.

Together, these findings provide some initial support that LKM intervention may be a promising strategy to address explicit and implicit stigma of mental illness. However, it is important to note that although a single session LKM was associated with positive attitudes toward a stranger who was not targeted in the meditation, this stranger was a “neutral” one who did not belong to a stigmatized group. Moreover, no study has examined the efficacy of a single session LKM on implicit stigma. Thus, this study was be the first to examine the efficacy of a short (i.e., 15-minutes) LKM practice on reducing both explicit and implicit stigma toward a stigmatized condition that was not specifically targeted in meditation.

**Bipolar Disorder Stigma**

Bipolar disorder is a condition that has been scarcely examined and targeted by stigma
reduction interventions. The majority of existing stigma research about mental illness has examined stigma toward “mental illness” in general, or toward either schizophrenia or unipolar depression in particular (Angermeyer & Dietrich, 2006; Bonnington & Rose, 2014). Potentially, the benefit of addressing stigma of mental illness in general is that it allows for interventions to be applied to all disorders, thereby increasing the reach of these interventions. However, it is possible that interventions are more efficacious when they target stigma of a particular mental illness. At least for EC approaches, receiving more personalized information about a specific mental illness could better reduce stigmatizing perceptions of individuals with that condition. In addition, the idea that a single, nonspecific intervention will sufficiently target all mental illness stigma may overlook the unique experiences and struggles of individuals with diverse conditions.

Bipolar disorder is unique relative to other disorders in that public stereotypes associated with it are both positive and negative. In the media, bipolar disorder has been associated with creativity and intelligence (Ellison et al., 2013). This association may reflect research finding a link between creativity and bipolar disorder in case-control studies using Swedish registries. For instance, individuals with bipolar disorder were shown to be overrepresented in creative professions compared to those with schizophrenia and unipolar depression in both Kyaga et al. (2011) and MacCabe et al. (2018).

The public also tends to perceive those with bipolar disorder as having better personal hygiene than those with depression (Day et al., 2007). Moreover, media coverage of bipolar through TV programs and celebrity disclosures have increased over the last decade, contributing to increased familiarity with and awareness of bipolar disorder (Ellison et al., 2013). An experimental study explored whether stigma reduction toward bipolar disorder could be achieved
via parasocial contact with a celebrity (i.e., Demi Lovato) with bipolar disorder in one of the three forms of contact (announcement, TV interview, or a magazine interview) versus a comparison condition (Wong et al., 2017). Results indicated that exposure to TV and magazine disclosures led to reductions in social distance and endorsement of negative stereotypes toward people with bipolar disorder in general (Wong et al., 2017).

At the same time, people also perceive those with manic symptoms as being quite out of control, dangerous, and unpredictable (Ellison et al., 2013; Wolkenstein & Meyer, 2010). These types of stereotypic beliefs have been found in other stigma research to be associated with fear, which predicts discriminatory behaviours (Corrigan et al., 2003). Specifically, mania is viewed as more dangerous than anxiety and depressive symptoms, although less unpredictable than schizophrenia (Stip et al., 2006). These public perceptions are in contrast to data suggesting that risk of violence in individuals with bipolar disorder can be accounted for by substance abuse comorbidity; in other words, the risk was minimal in individuals without substance abuse comorbidity and this link was further weakened when unaffected full siblings of individuals with bipolar disorder were used as controls (Fazel et al., 2010).

There are a number of reasons why stigma toward bipolar disorder needs to be addressed specifically, rather than via a non-specific mental illness stigma intervention. First, compared to unipolar depression, bipolar disorder is less understood by the public and may be associated with higher levels of stigma. Among adults 19 to 35 years old, attitudes toward an individual with manic symptoms were more negative than attitudes toward an individual with depressive symptoms (Wolkenstein & Meyer, 2010). Second, compared to schizophrenia, bipolar disorder has greater prevalence; encountering someone with bipolar disorder directly or by extension in one’s daily life is more realistic.
In addition, and more importantly, the need to explore public stigma toward bipolar disorder is apparent due to the impact of public stigma’s harmful impact on the quality of life as demonstrated by the moderate to high degree of internalized stigma in individuals living with the disorder (Ellison et al., 2013). In a study of individuals who self-reported to be functioning well with bipolar disorder, Michalak et al., (2011) found that several participants reported internalizing the negative public stigma of bipolar disorder, and that a proportion of participants described a gradual process of coming to an acceptance of living with the diagnosis and progression toward no longer endorsing and internalizing stigma. These reports indicate that stigma is a significant stressor for individuals living with bipolar disorder.

A review by Hawke et al. (2013) summarizes the negative repercussions of stigma on quality of life, functioning, and interpersonal relationships for individuals with bipolar disorder, as well as on increased burden and stress in caregivers of those with bipolar disorder. Among individuals with bipolar disorder, concerns about being stigmatized for their condition are linked with greater impairment in social and leisure functioning, even after controlling for social adaptation, symptom severity, and demographic characteristics (Perlick et al., 2001). Moreover, internalized stigma appears to predict social functioning and other factors that are linked to social functioning, such as perceived social support and depressive symptoms, in individuals who are in complete remission for bipolar disorder (Cerit et al., 2012).

Given the uniqueness of the disorder and the apparent need, investigating the stigma associated with bipolar disorder may provide a more nuanced understanding of mental illness stigma reduction strategies and contribute to the overall improvement in the quality of life in individuals living with bipolar disorder. For these reasons, I chose bipolar disorder as the target condition in the current study.
The Current Study

The aim of the study was to test the efficacy of a novel intervention approach involving mindfulness practice (LKM), relative to the efficacy of an intervention combining education and contact strategies (EC), and a control condition, on reducing stigma of bipolar disorder. All three components of stigma (affective, cognitive, and behavioural) were measured. Stigma was assessed via self-reported explicit measures toward a hypothetical person with bipolar disorder. In addition, I included implicit measures of stigma, and measures of actual behaviours and behavioural intentions, and actual affect, toward an individual believed to have bipolar disorder via a real-life interaction task. The addition of these measures is in contrast to the vast majority of existing literature that limits outcome variables to affect and behavioural intentions toward a hypothetical target with mental illness in a vignette or toward nonspecific persons with mental illness in general. I also tested the putative mediators of each intervention (in contrast to existing literature), and then explored the potential order of change in stigma components.

The EC approach is currently the most empirically supported intervention for reducing stigma as measured by explicitly self-reported cognitive stigma, affective, and behavioural intentions toward a hypothetical person with mental illness (or toward nonspecific people with mental illness in general), albeit with medium to small effect sizes that diminish over a longer period of time (Na et al., in preparation). However, the existing literature suggests less support for EC on implicit stigma, affective stigma toward hypothetical and real-life people with mental illness, and behavioural stigma (including intentions) toward real-life people with mental illness. EC is theorized to reduce stigma via the mediator of higher knowledge of bipolar disorder.

LKM is proposed as a novel intervention for targeting the emotional route of stigma reduction (affective stigma), and implicit stigma. Given that changes in affect are thought to
closely relate to behavioural changes, LKM may also have greater effects on reducing
behavioural stigma (and resulting in more positive behavioural intentions) toward real-life
people with mental illness. LKM is hypothesized to operate via the meditators of more positivity
and less negativity toward others.

Study Aims and Hypotheses

Aim 1: Intervention Effects on Explicit Stigma Toward a Hypothetical Person

My first aim was to assess the effects of each intervention condition on explicit stigma
toward a hypothetical person with bipolar disorder, and mediators of these effects. Explicit
stigma includes cognitive stigma (i.e., stereotypic beliefs), affective stigma (i.e., emotional
responses), and behavioural intentions (i.e., desire for social distance) toward a hypothetical
target with bipolar disorder in a vignette. This is the most common way that stigma has been
assessed in the literature to date.

Hypothesis 1a. I hypothesized that both the EC and LKM interventions would lead to
significantly lower levels of each of the three components of explicit stigma relative to the
control condition. Differences between LKM and the EC intervention were also expected for
affective stigma and cognitive stigma. Specifically, I hypothesized that LKM would lead to less
affective stigma compared to EC, whereas the EC intervention would lead to less cognitive
stigma compared to LKM. No differences between LKM and the EC intervention were expected
for behavioural intentions toward a hypothetical person with bipolar disorder.

Hypothesis 1b. Regarding mediators of these main effects, I hypothesized that LKM
would lead to lower levels of explicit affective stigma and to more positive behavioural
intentions toward the hypothetical person with bipolar disorder as a result of higher positivity
and lower negativity toward other people (compared to the other conditions). See Figure 1.
By contrast, I hypothesized that the EC intervention would result in lower levels of explicit cognitive stigma and in more positive behavioural intentions through higher knowledge about bipolar disorder relative to other conditions. See Figure 2.

**Aim 2: Intervention Effects on Implicit Stigma**

My second aim was to assess the effects of each intervention condition on implicit stigma toward bipolar disorder, and mediators of these effects. Implicit stigma consists of expressions of bias that are automatically activated without one’s conscious awareness or control (Greenwald & Banaji, 1995; Teachman & Wilson, 2006).

**Hypothesis 2a.** I hypothesized that LKM would result in lower implicit stigma than the EC intervention and the control condition. No significant differences between the EC intervention and control condition were expected.

**Hypothesis 2b.** Regarding mediators of this effect, I hypothesized that LKM would lead to lower implicit stigma through being higher in positivity and lower in negativity toward other people in general relative to EC and control conditions. This is the same pathway through which LKM is hypothesized to lead to lower explicit stigma toward a hypothetical person. See Figure 3.

**Aim 3: Intervention Effects on Stigma Toward a Confederate**

My third aim concerned intervention effects (and mediators of these effects) on lower behavioural stigma, as measured via real-life observed discriminatory behaviours and behavioural intentions toward a confederate with bipolar disorder; this is in contrast to self-reported behavioural intentions toward a hypothetical target with bipolar disorder. I also examined these same intervention effects on lower affective stigma toward the real-life confederate with bipolar disorder, which again differs from existing work that focuses on affective stigma reported toward a hypothetical target with mental illness in a vignette.
**Hypothesis 3a.** I predicted that lower real-life discriminatory behaviours and more positive behavioural intentions (willingness for future contact) toward an actual confederate with bipolar disorder would be observed in the EC and LKM conditions compared to the control condition. However, LKM was expected to be associated with lower discriminatory behaviour and greater intention for future contact with the confederate with bipolar disorder compared to the EC condition. Similarly, compared to the control condition, LKM and EC interventions were both expected to be associated with lower negative affect and higher positive affect (i.e., affective stigma) during the interaction task with a partner believed to have bipolar disorder. However, I also predicted that LKM would be associated with lower negative affect and higher positive affect than the EC condition.

**Hypothesis 3b.** LKM and EC interventions would be associated with lower real-life behavioural stigma, more positive behavioural intentions, and lower affective stigma toward an actual confederate with bipolar disorder via the same mechanisms as proposed for explicit cognitive stigma, affective stigma, and behavioural intentions toward a hypothetical target with bipolar disorder in a vignette (Hypothesis 1b). Compared to the control group, LKM would be associated with lower real-life behavioural stigma, more positive behavioural intentions, and lower affective stigma due to higher positivity and lower negativity toward other people in general. See Figure 4.

For EC, the association between the intervention and the outcomes of lower real-life behavioural stigma, more positive behavioural intentions, and lower affective stigma would be due to higher knowledge of bipolar disorder (Figure 5).

**Aim 4: Order of Change in Stigma Components**

As an exploratory aim, the order of change in the stigma components following the
completion of the EC intervention was examined. I selected the EC condition to examine this question in order to build upon the existing empirical findings of previous education and contact interventions on reducing stigma. Moreover, the two theoretical frameworks relevant for understanding the order in which stigma components may change, the attribution and intergroup contact theories, have served as foundations for education and contact strategies. By contrast, little is known about the potential for LKM to reduce stigma, or how the hypothesized reduction might occur, as LKM is a novel approach. Thus, given the stronger theoretical and empirical basis for examining the order of change in stigma components after EC, I chose to test this aim through comparing the EC condition to the control condition.

The outcome variable was real-life behavioural stigma for both of the models. The first serial mediation model (i.e., affective-cognitive) tested whether the EC intervention first leads to lower affective stigma, followed by cognitive stigma. An alternative model (i.e., cognitive-affective) explored whether change in cognitive stigma precedes change in affective stigma. Notably, both models hold that changes in behavioural stigma would occur after changes in both cognitive and affective stigma, the difference concerns the order in which cognitive and affective stigma change occurs.

**Hypothesis 4a.** I predicted that the affective-cognitive mediation model would emerge as the statistically significant model. See Figure 6.
Figure 1
Mediation Model for the Effect of LKM on Affective Stigma and Behavioural Intentions Toward a Hypothetical Person

![Diagram showing the relationship between LKM, positivity/negativity, affective stigma, and hypothetical behavioural intentions.]

Figure 2
Mediation Model for the Effect of EC on Cognitive Stigma and Behavioural Intentions Toward a Hypothetical Person

![Diagram showing the relationship between EC, knowledge about bipolar disorder, cognitive stigma, and hypothetical behavioural intentions.]

**Figure 3**

*Mediation Model for the Effect of LKM on Implicit Stigma*

![Diagram](image)

**Figure 4**

*Mediation Model for the Effect of LKM on Stigma Toward the Confederate*

![Diagram](image)
Figure 5

*Mediation Model for the Effect of EC on Stigma Toward the Confederate*

![Diagram of the mediation model](image)

Figure 6

*Serial Mediation Models for the Effect of EC on Behavioural Stigma*

![Diagram of serial mediation models](image)
Method

Participants

Participants were 376 undergraduate students recruited from the Department of Psychology’s Human Subjects Pool (HSP) at the University of British Columbia. The HSP is composed of students enrolled in an undergraduate psychology course in which they could receive extra marks toward the final grade for participation in research. There were no inclusion criteria other than being in the HSP system. Participants were compensated with 1.5 course credits for 1.5 hours of participation.

Among the participants, 284 identified as female, 90 identified as male, and 2 identified as other (i.e., agender and non-binary). Their mean age was 20.82 years old (SD = 2.77) and the range was 17 to 40 years old; two participants declined to report their age. Participants were 22.3% Caucasian, 44.2% East Asian (i.e., Chinese, Japanese, Korean), 11.4% South Asian, 5.1% Central Asian/Middle Eastern, 4.3% Southeast Asian, 2.4% South or Latin American, 1.3% African or Caribbean/West Indian, and 9% other. Among these participants, 46.5% were born in Canada and 54.3% reported English as being their first language.

Procedure

Participants were informed that they were taking part in a study examining people’s knowledge about various mental illnesses. Upon arrival at the waiting area of the laboratory, they were introduced to a confederate, who was ostensibly a fellow undergraduate student scheduled for the same timeslot of the study. This study involved eight confederates, who were recruited

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1 Three hundred and eighty-five undergraduate students completed the experimental protocol, but nine participants were excluded prior to analyses due to non-adherence to instructions for intervention videos (e.g., attempted to exit the video prematurely or research assistants observed clear signs of participant not watching the intervention video).
via ad postings in the Department of Psychology. The mean age of confederates was 21.50 (SD = 3.07) and the range was 20 to 29 years old. There were seven female confederates and one male confederate. Most of the confederates had completed 2 years of post-secondary education (range 1-4 years) and therefore, were credible in their role as fellow study participants. All of the confederates were fluent in English and were trained to adhere to a study protocol which outlined how they should interact with the participants.

During the consent process, a research assistant obtained written and verbal consents from both the participant and the confederate and provided them with copies of the consent form for their records. They were informed about and consented to the video recording involved in the study. Prior to starting the study tasks, the participant and the confederate (as a pair) were asked to randomly select a mental illness they would be learning about as part of the study by drawing a slip from a hat containing a number of slips that ostensibly contained different mental disorders. However, all pairs were assigned to hear about bipolar disorder. This deception was needed to reduce participants' suspicions regarding the confederate's subsequent disclosure in the interaction task about having a bipolar disorder diagnosis. The confederate was kept unaware of the design of the study, the participant’s experimental condition, the measures administered to the participants, and the participant’s answers on measures, but was aware that the purpose of the study was to examine factors influencing participants’ stigma toward bipolar disorder.

The participant and the confederate were then instructed to complete the first part of the study in two separate rooms. All experimental tasks and measures were completed at the lab and administered on laptops using the Qualtrics software. Participants were randomly assigned to one of three experimental conditions: (a) LKM, (b) EC, (c) control. Random number generator was used to generate a number from 1 to 3 corresponding to each of the conditions for each
participant ID prior to data collection. When a participant’s data was excluded for reasons listed above, the data was replaced according to the participant ID order.

Materials for all three conditions were delivered via a prepared video-recording by the same presenter, Dr. Steven Barnes, who is a faculty member in the Department of Psychology at the University of British Columbia. Dr. Barnes is an ideal person to present this material because of his personal experience with bipolar disorder, as well as with teaching and instructional videos (i.e., he speaks in recorded educational videos for Massive Open Online Courses). Video-recording was chosen to best ensure that all the participants in the same experimental condition received the same stimulus. Dr. Barnes delivered all three recordings to balance potential effects of the presenter across the three conditions.

In a private room without the confederate, participants completed measures of shyness and sociability (see Appendix A). Then, participants watched the video associated with the condition to which they were assigned. See Appendix B for detailed scripts and instructions for each of the conditions. Participants assigned to LKM watched a 15-minute video recording, in which Dr. Barnes guided them through a meditation exercise. Progressively, they were instructed to direct their love and warmth toward a loved one, oneself, an acquaintance, a difficult person, and all beings.

Those randomized to the EC condition watched a 15-minute video clip of Dr. Barnes, in which he provided psychoeducation about bipolar disorder and also shared his personal experience with bipolar I disorder. The education component was presented first, and included empirically supported information (e.g., prognosis, treatment options, the impact of stigma for individuals with bipolar disorder) about bipolar disorder. In second half of the video, Dr. Barnes shared his personal experience with the disorder. The sequence of education and contact material
presented was based on the finding by Chan et al., (2009) that those who received education followed by video-contact demonstrated greater decreases in stigma compare to those who received video-contact prior to education, and those who received education alone.

Participants assigned to the control condition watched a 15-minute video clip of Dr. Barnes presenting non-educational information about bipolar disorder. The clip mentioned bipolar disorder without the active ingredients of the education intervention (i.e., empirical evidence about prognosis, treatment, stigma). For example, the video contained information such as names of researchers who study bipolar disorder around the world, and their universities.

Following the video, all participants completed a battery of manipulation checks and outcome measures on a laptop. Manipulation check measures assessed if positivity toward self and others was higher and negativity toward self and others was lower in the LKM condition, and knowledge of bipolar disorder was higher in the EC condition, relative to the other conditions (see Appendix C). These variables were also tested as mediators, and thus were completed before the outcome measures to ensure appropriate temporal order for examining mediation. Then, participants completed outcome measures of explicit and implicit stigma toward bipolar disorder and reported on characteristics such as their familiarity with the disorder (see Appendices D, E, and F).

The final part of the study consisted of the participant interacting with the confederate for a 5-minute “peer debrief” session. The purpose of this ostensible peer debrief was to create a situation as realistic and naturalistic as possible where the confederate could disclose a bipolar disorder diagnosis to the participant. Participants were presented with the following rationale for the piloting of peer debrief method (instead of a traditional debrief with a research assistant): (a) to enhance the learning experience of the participants by engaging in a discussion about the
study, and (b) to streamline the debriefing process. The participant and confederate were given a set of peer debriefing questions to follow. During the first minute of the peer debrief, the confederate revealed to the participant that their experience of participating in the study was uncanny because they have bipolar disorder (see script in Appendix G). Following this disclosure, the participant and confederate continued to complete the other peer debriefing questions. Confederates were trained to adhere to a strict procedure and script to ensure standardization of the interaction across all participants. The entire duration of the interaction task was recorded.

Following the interaction task (i.e., peer debriefing session), participants completed the post-interaction affect measure and suspiciousness check before they were debriefed thoroughly at study end (see Appendices G and H).

Measures

Participants completed all of the self-report and behavioural measures in the order presented in this Measures section.

See Appendices A, C, D, E, F, G, and H for all measures. The same measures were completed by participants in all three experimental conditions.

**Participant Personality Characteristics (Potential Covariates)**

Before watching the video associated with their experimental condition, participants reported on their shyness and sociability by completing the Revised Cheek and Buss Shyness Scale (Cheek & Buss, 1990; $\alpha = .90$) and Cheek and Buss Sociability Scale (Cheek & Buss, 1981; $\alpha = .79$). They rated the extent to which each statement was characteristic of their feelings and behaviours ($1 = very uncharacteristic or untrue; 5 = very characteristic or true$). These
measures were necessary to establish that there were no significant differences in participants’
shyness and sociability across the conditions.

Post-Video Measures (Manipulation Checks and Mediators)

Evaluation of Experimental Condition Video. Immediately after watching the video
associated with their experimental condition, participants completed a self-assessment of how
engaged they were (1 = not at all; 5 = extremely) and how they felt about the speaker in the
video (0 = extremely negative/cold; 100 = extremely positive/warm).

Positivity and Negativity Toward Self and Other. Participants then completed the Self-
Other Four Immeasurables (SOFI; Kraus & Sears, 2008) scale. This scale is composed of four
subscales: Positive Self (α = .91), Negative Self (α = .89), Positive Other (α = .87), and Negative
Other (α = .83). Participants rated the extent to which each positivity and negativity word applied
to themselves and to others in general on a five-point Likert scale (1 = very slightly or not at all;
5 = extremely). This was used to test the hypothesis that LKM is associated with more positivity
toward self and others in general (friendly, joyful, accepting, compassionate) and less negativity
toward self and others in general (hateful, angry, cruel, mean), relative to EC and control.

Knowledge About Bipolar Disorder. Participants also completed a knowledge test
about bipolar disorder. The questions were in a multiple choice and true-or-false format and
based on the video that participants in the EC intervention watched. This was used to test the
hypothesis that participants in EC would show higher knowledge than those in LKM and control.

Explicit Stigma Toward a Hypothetical Person (Outcome Variable)

After the mediator/manipulation check measures were completed, participants completed
a battery of measures assessing explicit stigma toward a hypothetical target person with bipolar
disorder. They first read a vignette of a person diagnosed with bipolar disorder (Ellison, Mason,
Although a diagnostic label can have additional negative influence on attitudes toward the person who is labelled (Angermeyer & Matschinger, 2003), due to the design of the study, the diagnosis of the vignette individual was explicit. Participants’ emotional reactions, stereotypical beliefs, and behavioural intentions toward the hypothetical target with bipolar disorder in the vignette were measured.

**Cognitive Stigma (Stereotypic Beliefs) Toward a Hypothetical Person.** The Personal Attributes Scale (PAS) was used to assess two components of stereotypes about mental illness, perceived dangerousness and dependency (Angermeyer et al., 2004), and a third component specific to bipolar disorder, intelligence/creativity (Ellison, Mason, & Scior, 2015). Participants rated the extent to which these attributes describe the hypothetical person described in the vignette using a five-point Likert scale (1 = definitely not true; 5 = definitely true). Cronbach’s alpha in this sample was .67 for dependency, .75 for dangerousness, and .83 for intelligence/creativity, which was comparable to the coefficients (range = .69 to .87) reported by Ellison, Mason and Scior (2013).

**Affective Stigma (Emotional Reaction) Toward a Hypothetical Person.** The Emotional Reaction to Mental Illness Scale (Angermeyer et al., 2004; Wolkenstein & Meyer, 2010) consists of 15 items which map onto three overarching categories of emotional responses (specifically, fear, pity, and anger) that people typically express toward an individual with mental illness. Participants rated the extent to which they felt each of the emotions toward the hypothetical individual in the vignette using a five-point Likert scale (1 = not at all; 5 = very much). An average score was calculated for each of the three categories of emotions: fear (α = .85), pity (α = .81), and anger (α = .91).

**Behavioural Intentions Toward a Hypothetical Person.** Participants’ desire for social
distance from an individual with bipolar disorder was measured using the Social Distance Scale (SDS; Link et al., 1999). Participants rated their desire to: (a) move next door to the target person with bipolar disorder in the vignette, (b) spend an evening socializing with the person, (c) make friends with the person, (d) start working closely with the person, and (e) have the person marry into the family, on a 4-point Likert scale (1 = definitely unwilling; 4 = definitely willing). Higher scores indicate lower desire to distance from the hypothetical individual with bipolar disorder (i.e., more positive behavioural intentions to interact with someone with bipolar disorder). A composite measure of social distance was calculated by totaling the sum of all items. Cronbach’s alpha was .83.

**Implicit Stigma (Outcome Variable)**

The Single Category Implicit Attitudes Test (SC-IAT; Karpinski and Steinman, 2006) was administered to measure participants’ implicit attitudes toward bipolar disorder. The SC-IAT was chosen over the Implicit Attitudes Test (IAT), the most commonly used procedure to assess implicit stigma, as there is no natural complementary comparison group for bipolar disorder, which is required for the IAT. The SC-IAT script provided by Millisecond Software was run on Inquisit 5 (Millisecond Software, 2015). This script was based on Karpinski and Steinman (2006) with minor changes. In this task, participants were required to correct their error responses as recommended by Greenwald et al. (2003).

The final list of words consisted of 15 positive attribute words, 15 negative attribute words, and 4 target category (i.e., bipolar disorder) words. During the SC-IAT, the participants were presented with the attribute words in the middle of a computer screen. First, participants were instructed to press one key on a keyboard whenever the attribute word belonged to the category on the left (e.g., “Positive or Bipolar Disorder”) and to press a different key when the
attribute word belonged to the category on the right (e.g., “Negative”). Then, this pattern was reversed so that participants pressed one key whenever the attribute word belongs to the category on the right (e.g., “Negative or Bipolar Disorder”), and pressed the other key when they saw attribute words that belonged to the category on the left (e.g., “Positive”). The computer screen displayed reminders about these instructions. See Appendix E for instructions and figures of the instructions page. Each block consisted of 24 practice trials and 72 test trials.

The mean response time when the category label word referring to the vignette target with bipolar disorder was paired with negative attribute words were subtracted from when the category label word referring to target with bipolar disorder was paired with positive attribute words; then the difference was divided by the standard deviation. This calculation is commonly referred to in the SC-IAT literature as a d-score (Karpinski and Steinman, 2006). Thus, in the current study, positive d-scores indicate more implicit stigma toward bipolar disorder, whereas negative d-scores indicate more positivity toward bipolar disorder.

**Participant Demographic Characteristics (Potential Covariates)**

Participants then completed a demographics questionnaire. They also completed questions assessing their familiarity (e.g., Do you know anyone who has been diagnosed with bipolar disorder? How close are you to this person?) and personal experience with bipolar disorder (e.g., Have you been diagnosed with bipolar disorder?), and with other mental illnesses (Have you ever been diagnosed with a mental disorder? If so, please specify). Finally, they were asked if they knew Dr. Barnes (the presenter of the videos) and his bipolar disorder diagnosis prior to participating in the study.

**Stigma Toward the Confederate (Outcome Variables)**

Following the completion of all aforementioned measures, participants completed a 5-
minute interaction task, which was presented as a peer debriefing procedure to increase the likelihood that the participants believed that they had completed the experimental component of the study. However, the actual purpose of the task was to measure participants’ affect, behaviour, and behavioural intentions toward a real-life individual with bipolar disorder. The task was composed of a structured component in which the participants answered the debriefing questions provided to them, and an unstructured component following the completion of the standardized debriefing questions.

Participants were told that “the current study is one of several HSP studies this semester that is piloting a paired peer debrief procedure to evaluate its usefulness over the traditional debriefing method.” The participant and the confederate were instructed to sit at a specific spot for observation coding purposes. They were instructed that the research assistant would return in 5 minutes to meet with them individually to receive feedback about the peer debriefing procedure and to answer any questions about the study. Peer debriefing questions were as follows: (1) How many studies have you participated in prior to this one; (2) What was this experiment like for you; (3) Were there any surprises; (4) What part of the study did you find most engaging; (5) What would you change about the experiment? The purpose of these questions was to guide the interaction between the confederate and the participant and to give the confederate an opportunity to disclose a bipolar disorder diagnosis when answering the second question. If the participants finished discussing all the questions before the end of the 5 minutes, they were told to wait until the research assistant returned.

**Affective Stigma (Emotional Reaction Toward the Confeder ate).** Following the interaction task, participants completed the ERMIS to rate the degree to which they experienced each of the emotions toward the confederate during the task. This is the same measure that the
participants completed earlier to assess their emotional response to the hypothetical target with bipolar disorder in the vignette. This time, however, participants completed the ERMIS about their affective response during their real-life encounter with the confederate. All of the emotion words were identical to the ones used in the previous version of ERMIS about the hypothetical person, but they were reordered so that the participants would not be familiar with the order in which the emotion words were presented. The internal consistencies for each of the subscales were as follows: fear ($\alpha = .83$), pity ($\alpha = .79$), and anger ($\alpha = .91$).

**Behavioural Stigma (Behaviours Toward the Confederates).** Immediately after the interaction task, the confederate completed an impression rating of the participant by rating the participant’s positivity and negativity toward them during the task. Specifically, positivity was measured by confederate’s rating of how warm, likeable, pleasant, and friendly ($\alpha = .92$) the participant was toward them, and negativity was measured by the confederate’s rating of how cruel, tense, standoffish, rigid, uncomfortable, and frightened ($\alpha = .80$) the participant seemed toward them, on a 5-point scale. Positivity and negativity scores were calculated by averaging the ratings for the words in each of the categories.

In addition, thin-slice methods used in social psychology to study racial bias in Dovidio et al. (2002) and Richeson and Shelton (2005) were adapted for this study. Two research assistants who were not involved in the coding process first watched the peer interaction task videos to mark the structured and unstructured components. The structured component captured the 30 seconds of the interaction immediately following the confederate’s disclosure of having a diagnosis of bipolar disorder, which occurred after the second debriefing question. The unstructured component began as soon as the last debriefing question was answered and lasted until the end of the 5-minute interaction. Because participants varied in how long they spent on
answering the prescribed debriefing questions, the start time of the unstructured component varied across dyads. Once the timepoints of the unstructured component was determined for each participant’s interaction, a 1-minute segment of the unstructured component was randomly chosen to be coded. A study comparing coded behaviours from a 1-minute “thin-slice” segment and from the full 15-minute interaction showed high correlations between the two for participants’ non-verbal behaviours (e.g., gaze, gesture, nod, smile; Murphy, 2015). Based on this finding, I decided that coding a 1-minute segment instead of the full segment would increase efficiency while not compromising reliability.

Coders who were unaware of the participant's experimental condition then watched the 30-second clip of the interaction immediately after the confederate discloses a bipolar disorder diagnosis (referred to as the structured component). They also watched the randomly selected 1-minute segment of the unstructured component of the interaction. Coders watched the video clips without sound and did have any prior knowledge of the context of the interaction. The coding team was comprised of four coders (75% female, $M_{age} = 20.25$) recruited via ads posted within the Department of Psychology. They were either enrolled in 3rd or 4th year of undergraduate studies and had no prior knowledge about the design and the purpose of the study. Two pairs of coders were randomly assigned to each of the participants; one pair for the structured segment and another pair for the unstructured segment. Coders rated the participant using the same impression rating measure used by the confederate to rate the participant after the interaction. Interclass correlation coefficients (ICC) were computed to assess the reliability between the two coders (Table 1). Conventions for ICCs are that values less than 0.5 indicate poor reliability, values between 0.5 and 0.75 indicate moderate reliability, values between 0.75 and 0.9 indicate good reliability, and values greater than 0.9 suggest excellent reliability (Koo & Li, 2016).
Overall, ICCs between coders were poor to moderate for the structured segment, ranging from -0.037 to 0.67 for both positive and negative descriptors. For the unstructured segment, ICCs for negative descriptors were not acceptable (range 0.021 to 0.59), whereas ICCs for positive descriptors (i.e., warm, pleasant, likeable, friendly) were within the acceptable range, 0.78 to 0.80. Thus, only the positive descriptors from the unstructured segments were used in the analyses because I was not confident in the inter-rater reliability of the other codes. For each of the positive descriptors (i.e. warm, pleasant, likeable, friendly), a mean score was calculated by averaging the impression ratings from the two coders. The internal consistency for the four positive descriptors was $\alpha = .98$. Therefore, an overall positive impression score was calculated by computing the average of the four positive descriptors.

**Behavioural Intentions Toward the Confeder ate.** For a measure of actual, real-life behavioural intentions for social engagement with an individual who has bipolar disorder, participants were asked if they would like to participate in a follow-up study with their debriefing partner (the confederate who ostensibly has bipolar disorder). The follow-up study was described as one in which they will engage in relationship- and trust-building exercises, such as sharing answers to questions designed to increase closeness between two individuals. The purpose of this description was so that the participant would expect to engage in a significant level of social interaction with the confederate should they elect to sign up for the follow-up study. Participants were assured that their decision to participate or not would not affect their grade in any course. Also, they were told that the follow-up study would offer monetary compensation instead of course credit, in order to be viable for the participants who did not need more course credit. Participants were asked to indicate whether they want to: (a) sign up for the follow-up study now, or (b) decline to do so. In reality, no such study was conducted; the sole
purpose of presenting the study to the participants was to measure their behavioural intentions for future social interaction with the confederate.

**Suspiciousness Check**

At the conclusion of the study, participants also completed suspiciousness questions to assess whether they were aware of the purpose of the study while they were completing the tasks and whether they believed if the confederate had bipolar disorder or not. Participants were also asked if they knew Dr. Barnes, the presenter in the videos associated with each experimental condition.

**Data Analytic Plan**

**Power Analysis**

An a priori power analysis was conducted with G*Power software. The appropriate number of participants needed across three conditions in total to detect a small effect size of \( f = 0.18 \) (converted from \( g = .36^2 \)) with power of .80 is 303 (101 per condition).

**Missing Data**

Among the 376 participants included in the analyses, complete data were collected for 328 participants. There were six participants whose interaction with the confederate could not be coded due to unavailable video recording. All of their self-reported and confederate-reported measures were included. For 13 participants who reported being suspicious of the confederate, only the responses regarding their explicit and implicit stigma toward a hypothetical individual with bipolar disorder were retained. Twenty-nine participants participated without a confederate.

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2 A small effect size \((g = .36)\) was chosen based on the weighted pooled effect sizes calculated for an earlier draft of Na et al. (in preparation). Since the completion of data collection, an updated meta-analysis has been conducted with additional studies. The findings are summarized on p. 11. Given that the updated effect sizes are larger, the effect size estimate used to determine number of participants for this study was conservative.
(because of issues scheduling a confederate), and therefore did not have data from the interaction task. Listwise deletion was used for calculating subscale scores when data were missing for the participant. The sample size for each of the administered tasks/measures is reported in the descriptive tables. See Table 2 for a detailed breakdown of participants.

**Intervention Main Effects**

An omnibus multivariate analysis of variance (MANOVA) was first conducted to test the effect of experimental condition (LKM, EC, or control) on each category of dependent variables that were considered to be theoretically related. A significant MANOVA result was followed up with a univariate analysis of variance (ANOVA) for each dependent variable in the category. Tukey's HSD post hoc comparisons were performed to determine when a particular condition had a significant effect and the pattern for each significant result. For hypotheses with only a single dependent variable, an ANOVA was conducted, and significant results were followed up with Tukey’s HSD post hoc comparisons.

**Explicit Stigma Toward a Hypothetical Person (Hypothesis 1a).** To investigate the effect of experimental condition on explicit stigma toward a hypothetical person with bipolar disorder, all of the composite scores for explicit stigma were entered into one MANOVA model: fear, pity, anger (affective), perceived dangerousness, dependency, and intelligence/creativity (cognitive), and behavioural intentions (behaviour).

**Implicit Stigma (Hypothesis 2a).** An ANOVA was conducted to test the effect of experimental condition on implicit stigma toward bipolar disorder.

**Affective Stigma Toward the Confederate (Hypothesis 3a).** To assess for the omnibus effect of experimental condition on real-life affective stigma toward a confederate who ostensibly has bipolar disorder, participants’ ratings of fear, pity, and anger toward the
confederate following the interaction task were entered into one MANOVA model.

**Behavioural Stigma Toward the Confederate (Hypothesis 3a).** Behavioural stigma toward the confederate was assessed using: (a) confederates’ impression ratings of the participants’ positivity and negativity during the interaction, and (b) coders’ impression ratings of participants’ positivity (because ratings of negativity did not have acceptable inter-rater reliability). The correlations among these variables were significant and in the expected direction. Thus, composite scores for these outcome measures were entered into one MANOVA model to test the effect of experimental condition on positivity and negativity toward the confederate.

**Behavioural Intentions Toward the Confederate (Hypothesis 3a).** For categorical outcome data (i.e., participants’ behavioural intentions for future interaction with the real-life confederate), a Pearson chi-square test was conducted to assess whether there is a relationship between participants’ willingness to engage in future research with the confederate (yes versus no) and the condition type (LKM, EC, control). Therefore, the data were organized into a 3 x 2 contingency table. Yes versus no response frequency was computed for each condition to examine whether there is a significant difference in the pattern of responses (i.e., the proportion of participants that indicated yes versus no to future participation with the confederate) across the three conditions. Cramér’s statistic (V) was consulted to determine the strength of the associations. Odds ratios were calculated to interpret the findings.

**Mediation Analyses**

Mediation analyses were conducted to test the mechanisms through which the EC and LKM interventions potentially reduce stigma of bipolar disorder. Analyses were conducted only for categories of outcomes for which significant univariate or omnibus main effects of condition
were observed. An individual mediation analysis was conducted for each of the outcome variables belonging to each category.

Mediations were tested by assessing the size of the indirect effect and its bootstrapped confidence interval using model 4 of the PROCESS macro developed by Hayes (2014). A significant mediation effect was inferred if the confidence interval did not contain zero (Field, 2018). Dummy variables were created to use experimental condition as the predictor variable. As there were three conditions ($k = 3$) in the study, two dummy variables ($D_i = k - 1$) were needed. The control group was chosen as the baseline group and was assigned “0” for both dummy variables. The experimental group of interest was coded as “1” and the other experimental group was coded as “0”. For the dummy contrast in which LKM is the comparison group ($D_{LKM}$), the set of contrasts used for testing LKM and its mediators was [LKM:1; EC: 0; control: 0]. For examining the effects of EC, the dummy variable ($D_{EC}$) was coded as [LKM: 0; EC: 1; control: 0]. Both of the dummy variables were entered into each of the regression models (Hayes & Preacher, 2013). Dummy codes were used instead of orthogonal contrasts to allow for comparison of each of the experimental condition to the control group (i.e., reference group).

For LKM, the mediators of interest were: (a) more positivity toward others, and (b) less negativity toward others. For the EC intervention, more knowledge of bipolar disorder was the proposed mediator. A priori decision was made to examine these variables as mediators only if there was a significant main effect of condition on each of these variables.

**Exploratory Analyses (Hypothesis 4)**

Two serial mediation analyses were conducted to determine whether affective stigma precedes cognitive stigma, or vice versa, in changing behavioural stigma as a result of completing the EC intervention. Analyses were conducted using model 6 of the PROCESS macro. As serial
mediation analysis was explored only for a subset of the sample – those in EC or the control condition - a new dummy variable was created for this analysis. The EC condition was coded as “1” and the control condition was coded as “0”. The dummy variable was entered into the model as the predictor variable. Then, behavioural stigma was entered as the outcome variable. To test the affective-cognitive model, affective stigma was entered first, then cognitive stigma as the proposed mediator. To examine the cognitive-affective model, cognitive stigma was entered first, and then the affective stigma as the proposed mediator. The two mediation models were compared to determine which model(s) met the conditions for a significant mediation.
### Table 1

**Interclass Correlation Between Coders**

<table>
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<tr>
<th>Attributes</th>
<th>Unstructured</th>
<th>Structured</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Positivity</strong></td>
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<td></td>
</tr>
<tr>
<td>Warm</td>
<td>.79</td>
<td>.44</td>
</tr>
<tr>
<td>Pleasant</td>
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<td>.67</td>
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<td>.64</td>
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<td>Friendly</td>
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<td>.55</td>
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<tr>
<td><strong>Negativity</strong></td>
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<td></td>
</tr>
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<td>.09</td>
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<tr>
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<td>.28</td>
</tr>
<tr>
<td>Rigid</td>
<td>.44</td>
<td>.19</td>
</tr>
<tr>
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<td>-.04</td>
</tr>
<tr>
<td>Cruel</td>
<td>.33</td>
<td>.18</td>
</tr>
<tr>
<td>Uncomfortable</td>
<td>.48</td>
<td>.38</td>
</tr>
</tbody>
</table>

*Note. Two-way random effects model where people effects and measures effects are random. ICC values less than 0.5 indicate poor reliability, values between 0.5 and 0.75 indicate moderate reliability, values between 0.75 and 0.9 indicate good reliability, and values greater than 0.9 suggest excellent reliability. Values with acceptable reliability (e.g., ICC ≥ .75) are bolded.*

### Table 2

**Available Data Across Conditions**

<table>
<thead>
<tr>
<th></th>
<th>EC</th>
<th>LKM</th>
<th>Control</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data from all tasks included</td>
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<td>108</td>
<td>110</td>
<td>327</td>
</tr>
<tr>
<td>Missing interaction task video</td>
<td>0</td>
<td>4</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>No confederate</td>
<td>3</td>
<td>11</td>
<td>15</td>
<td>29</td>
</tr>
<tr>
<td>Confederate suspicions</td>
<td>3</td>
<td>7</td>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>115</td>
<td>130</td>
<td>131</td>
<td>376</td>
</tr>
</tbody>
</table>
Results

Descriptive Statistics

Descriptive statistics of the primary study variables are presented in Table 3. The bivariate correlation matrix is presented in Table 4.

I first tested all outcome variables for homogeneity of variance, using Levene’s test based on the median. Levene’s test indicated that the variances were homogenous for all outcome variables. Next, to assess the distribution of data, I examined the skewness and kurtosis of all outcome variables. As shown in Table 3, the variables representing the affective response of anger and the belief of dependence about the hypothetical person with bipolar disorder were positively skewed above 1, and the kurtosis value for anger was above 1. Similarly, for confederate variables, participants’ anger and fear toward the confederate and confederate’s perceived negativity of the participant were positively skewed. A Monte Carlo simulation study found that F-test is robust to violations of normality under homogeneity of variance and also when distributions have values of skewness and kurtosis ranging between -1 and 1 (Blanca et al., 2017). Therefore, I conducted log transformations for beliefs of dependence and for anger. Applying a log transformation twice to the variables shifted their skewness and kurtosis to a more reasonable range (Table 5). Notably, the results found with the original values were not appreciably different from the results found using these transformed values, suggesting that the non-normal distribution of these variables did not affect the findings.

Participant Characteristics (Potential Covariates)

Descriptive statistics for participant characteristics (frequencies of participants’ familiarity with bipolar disorder, mental illness diagnosis, familiarity with the video presenter, and prior mindfulness experience, as well as the means of their sociability and shyness) are
summarized in Table 6. I conducted a series of ANOVAs to determine whether these participant characteristics differed across EC, LKM, and control conditions. I did not expect any differences, given random assignment to conditions. However, because each of these participant characteristics could potentially affect the outcome measures of stigma, any participant characteristic that was not equivalent across EC, LKM, and control groups would be covaried in main analyses.

As expected, ANOVAs revealed that none of these participant variables differed across EC, LKM, or control groups: participants’ familiarity with an individual with bipolar disorder, \( F(2, 373) = .46, p = .63 \); diagnosis of bipolar disorder, \( F(2, 372) = .12, p = .89 \); diagnosis of other mental disorder, \( F(2, 372) = .83, p = .43 \); prior familiarity with Dr. Barnes, \( F(2, 369) = 1.56, p = .21 \); awareness of Dr. Barnes’ diagnosis, \( F(2, 79) = .80, p = .45 \); prior experience with mindfulness meditation, \( F(2, 373) = 1.84, p = .16 \); shyness, \( F(2, 354) = .64, p = .53 \); or sociability, \( F(2, 368) = .15, p = .86 \). Thus, none of the participant characteristics were included as covariates.

**Confederate Factors**

A chi-square test between the eight confederates and the three experimental conditions indicated that there was no statistical difference in the distribution of confederates across the conditions, \( \chi^2 (14) = 14.15, p = .44 \). Based on this finding, I concluded that the confederates were approximately balanced across EC, LKM, and control conditions. I then conducted MANOVAs to explore whether the effects of experimental condition on the outcome measures reflecting the interaction with the confederate differed depending on the confederate. No interaction effects would justify collapsing data across confederates.
Crucially, there was no significant condition by confederate interaction in MANOVA testing the outcome variables of: participants’ reported affective stigma toward the confederate, Wilks’ $\lambda = .85, F(42, 777) = 1.09, \ p = .33, \eta_p^2 = .055$; or behavioural stigma toward the confederate as indicated by confederates’ positivity and negativity ratings and coders’ positivity rating, Wilks’ $\lambda = .88, F(21, 745) = .76, \ p = .87, \eta_p^2 = .041$. Nor was there a significant condition by confederate interaction in a chi-square testing the outcome of behavioural intentions toward the confederate as indicated by participants’ willingness to sign up for a follow-up study with the confederate, $\chi^2 (23) = 31.88, \ p = .10$. Therefore, I collapsed data across all confederates.

**Evaluation of Experimental Condition Videos**

Participants who watched the EC and LKM videos rated their engagement with the video to be significantly higher than those who watched the control video, $F (2, 325) = 97.93, \ p < .001$. There was no significant difference between EC and LKM groups ($p = 1.00$). Positive feelings toward Dr. Barnes were significantly higher for participants who watched EC and LKM videos compared to those who watched the control video, $F(2, 317) = 57.76, \ p < .001^3$. There was no significant difference between EC and LKM conditions on their feelings toward Dr. Barnes immediately following the video ($p = 1.00$). See Table 7 for means across the conditions.

**Manipulation Checks**

Manipulation checks were conducted to test whether each condition had the intended effect on the participants. See Table 8 for means of manipulation check variables across conditions. An ANOVA revealed that the knowledge of bipolar disorder after the video was

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^3 The reported $F$-statistics are based on 320 participants who responded to this question after a correction was made to a typo on one of the labels of the scale (i.e., “positive/cold” instead of “positive/warm”). As a result, 43 participants were excluded.
significant across the three conditions, \(F(2, 273) = 168.03, p < .001\). As expected, the mean of knowledge of bipolar disorder was the highest and significantly different in the EC condition compared to LKM (\(p < .001\)) and control (\(p < .001\)) conditions. Not surprisingly, there were no significant differences between LKM and control conditions in knowledge of bipolar disorder (\(p = .68\)). This finding provides support that EC condition was successful in increasing participants’ knowledge of bipolar disorder.

To test the effect of LKM on positivity and negativity toward self and others, a multivariate analysis of variance (MANOVA) was conducted. There was a significant multivariate main effect of condition, Wilks’ \(\lambda = .89, F(8, 718) = 5.54, p < .001, \eta_p^2 = .058\). Univariate tests on the variables revealed significant effects for positivity toward self, \(F(2, 326) = 11.32, p < .001, \eta_p^2 = .059\), and positivity toward others, \(F(2, 326) = 13.75, p < .001, \eta_p^2 = .094\). As expected, participants in the LKM had higher positivity toward self compared to those in the control condition (\(p < .001\)). Interestingly, those in the EC condition also had significantly higher positivity toward self compared to those in the control condition (\(p = .005\)). Participants’ positivity toward self did not differ between EC and LKM conditions (\(p = .41\)). Similarly, positivity toward others was significantly higher in LKM condition (\(p < .001\)), compared to the control condition, as expected. Higher positivity toward others was found in the EC condition (\(p < .001\)) compared to control condition as well, and there was no significant difference between LKM and EC conditions (\(p = .92\)). There was no significant main effect of condition on negativity toward self, \(F(2, 362) = .95, p = .39, \eta_p^2 = .016\). There was a marginally significant effect of condition on negativity toward others, \(F(2, 362) = 2.98, p = .052, \eta_p^2 = .016\), which was driven by the EC condition having lower negativity than the control condition; LKM did not differ from either the EC or the control condition.
This set of findings indicate that LKM was successful in increasing positivity toward self and others relative to the control condition, as expected, but that it did not affect negativity toward self and others. An unexpected finding was that EC also increased positivity toward self and others relative to the control condition, and that there was a trend for EC to reduce negativity toward others relative to control condition.

**Main Effects of Experimental Condition**

**Explicit Stigma Toward a Hypothetical Person (Hypothesis 1a)**

There was a significant multivariate main effect of condition on participant self-report measures of explicit stigma toward the hypothetical person with bipolar disorder in the vignette, Wilk’s $\lambda = .91, F(14, 708) = 2.41, p = .003, \eta^2_p = .046$. However, univariate tests on the outcome variables revealed significant effects only for beliefs of intelligence, $F(2, 360) = 4.68, p = .01, \eta^2_p = .025$, and feelings of pity, $F(2, 360) = 3.05, p = .049, \eta^2_p = .017$, and anger, $F(2, 360) = 3.12, p = .046, \eta^2_p = .017$. There was a marginally significant effect of condition on beliefs of dangerousness, $F(2, 360) = 2.75, p = .065, \eta^2_p = .015$.

Post-hoc Tukey’s HSD indicated that the participants in the EC condition provided significantly higher ratings of beliefs of intelligence compared to the control condition ($p = .007$) but the LKM condition was not significantly different from either the EC ($p = .34$) or control ($p = .21$) conditions. Participants in the EC condition indicated significantly higher feelings of pity toward the hypothetical person with bipolar disorder than those in the LKM condition ($p = .038$). However, the EC condition did not significantly differ from the control condition ($p = .34$) and

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4 The same pattern of results was found when the MANOVA was conducted with transformed values for anger and belief that a person with bipolar disorder is dependent, Wilk’s $\lambda = .91, F(14, 708) = 2.52, p = .002, \eta^2_p = .047$. Furthermore, univariate tests on the transformed outcome variables mirrored the original findings.
the control condition did not differ from the LKM condition \( (p = .53) \), in reported feelings of pity. Significantly lower levels of anger toward the hypothetical person with bipolar disorder were reported in the EC condition compared to the control condition \( (p = .035) \), but there were no significant differences between EC and LKM \( (p = .36) \) and between LKM and control \( (p = .51) \). All the means of the explicit stigma variables are reported in Table 9. Results are presented in graphs in Figures 7 and 8.

**Implicit Stigma (Hypothesis 2a)**

An ANOVA on the d-score yielded from the SC-IAT task indicated that there was no significant main effect of condition on implicit stigma, \( F(2, 373) = .14, p = .87 \). The scores indicate a “moderate” preference (i.e., d-score < 0.35) for bipolar disorder and negative attribute word pairings that consistently occurred across the three conditions (Milliseconds Software LLC, 2015). As a point of comparison, little to no preference is indicated by a d-score falling within the range of -0.15 to 0.15. Mean d-scores for each of the conditions are listed in Table 9.

**Stigma Toward the Confederate (Hypothesis 3a)**

**Affective Stigma Toward the Confederate.** There was no significant multivariate main effect of condition on participant self-report measures of affective stigma toward the confederate, Wilks’ \( \lambda = .98, F(6, 632) = 1.01, p = .41, \eta_p^2 = .010^5 \). Means for each of the conditions are listed in Table 10 and presented as a graph in Figure 9.

**Behavioural Intentions Toward the Confederate.** There was a significant association between the experimental condition and whether or not participants would take part in a follow-

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^5 Results remain unchanged when the MANOVA was run with transformed values for participants’ ratings of anger and fear toward the confederate, Wilks’ \( \lambda = .98, F(6, 632) = 1.22, p = .29, \eta_p^2 = .011 \).
up study with a confederate (who ostensibly has bipolar disorder), $\chi^2 (2) = 6.73, p = .035$. The odds ratio of participants’ willingness to participate in future research with the confederate was 1.86 times higher for participants in the EC and 1.78 times higher for participants in the LKM conditions compared to those in the control condition. There was no significant difference between participants in the EC and LKM conditions in their willingness to take part in a future study with the confederate. See Table 11 for a contingency table and Figure 10 for a graph.

**Behavioural Stigma toward the Confederate.** There was no significant multivariate main effect of condition on behavioural stigma toward the confederate as assessed by the confederate’s and the coders’ impression ratings, Wilks’ $\lambda = .99, F(6, 614) = .68, p = .67, \eta^2_p = .007$. Table 12 lists the means for each condition and Figure 9 displays the means in a graph.

**Mediation Analyses**

The mediating effects of knowledge of bipolar disorder for EC and positivity toward others for LKM on significant outcome variables (i.e., significant omnibus or univariate effect as an outcome category) were tested. In addition, as negativity toward others was marginally lower in the EC condition, it was also tested as a potential mediator in lieu of intergroup anxiety for EC. Thus, the outcome variables of interest included lower explicit stigma toward the hypothetical person with bipolar disorder and more positive behavioural intentions toward the confederate (i.e., willingness to participate in a follow-up study). All unstandardized $b$ coefficients for the paths in the mediation models are listed in Tables 13, 14, and 15.

**Knowledge of Bipolar Disorder**

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6 Results remain unchanged when the MANOVA was run with transformed value for confederates’ ratings of participants’ negativity, Wilks’ $\lambda = .99, F(6, 614) = .68, p = .67, \eta^2_p = .007$. 65
As predicted, the EC condition was significantly associated with more knowledge of bipolar disorder (i.e., $a_{EC}$ path) in the expected direction, whereas LKM was not (i.e., $a_{LKM}$ path).

**Explicit Stigma Toward a Hypothetical Person (Hypothesis 1b).** More knowledge of bipolar disorder was found to mediate the effects of EC on the following indices of stigma toward the hypothetical person with bipolar disorder: anger, fear, behavioural intentions, beliefs of dangerousness, and beliefs of dependency (Figure 11).

The relative indirect effect of EC on anger toward a hypothetical person with bipolar disorder via knowledge was significant, $b = -.28 [-.48, -.078]$. In other words, compared to those in LKM and control conditions, the higher knowledge of bipolar disorder for participants in EC was associated with lower anger toward the hypothetical person. Interestingly, although there were no significant main effects, more knowledge of bipolar disorder was found to mediate the effects of EC on fear ($b = -.28 [-.47, -.085]$), behavioural intentions ($b = .27 [.14, 40]$), and on beliefs of dangerousness ($b = -.37 [-.60, -.17]$) and dependency ($b = -.33 [-.52, -.16]$). The findings indicate that compared to those in the LKM and control conditions, participants in the EC condition reported less anger and pity, lower perceptions of dangerousness and dependency, and more positive behavioural intentions toward the hypothetical person, via the mediator of having more knowledge about bipolar disorder.

Although there was a significant main effect of EC on beliefs of intelligence, this effect was not mediated by knowledge of bipolar disorder, $b = -.12 [-.32, .075]$. Similarly, the significant main effect of EC on pity was not mediated by knowledge of bipolar disorder ($b = .070 [-.14, .28]$).
Behavioural Intentions Toward the Confederate (Hypothesis 3b). Knowledge of bipolar disorder was not a significant mediator of the relationship between EC and desire to participate in a follow-up study with the confederate, $b = .37 [-.094, .86]$.

In sum, greater knowledge of bipolar disorder emerged as a significant mediator for the EC condition’s effect on lower beliefs of dangerousness and dependence, more willingness to interact with, and less fear of and anger toward a hypothetical person with bipolar disorder in a vignette. However, knowledge did not mediate findings of EC on ratings of intelligence and pity toward the hypothetical person, or on behavioural stigma toward the confederate.

Positivity Toward Others

As expected, the LKM intervention was associated with more positivity toward others compared to control and EC conditions combined (i.e., $a_{LKM}$ path). An unexpected finding was that EC intervention was also significantly associated with more positivity toward others relative to LKM and control conditions combined (i.e., $a_{EC}$ path). Thus, mediation analyses for both LKM and EC interventions are reported below and in Table 14.

Explicit Stigma Toward a Hypothetical Person (Hypothesis 1b). More positivity toward others was found to mediate the effects of LKM on the following outcome variables, all reflecting self-reported stigma toward a hypothetical person with bipolar disorder in the vignette: behavioural intentions, beliefs of intelligence, and pity (Figure 12). The relative indirect effects of LKM on these outcomes are: behavioural intentions, $b = .056 [.006, .11]$, beliefs of intelligence, $b = .11 [.038, .19]$, and pity, $b = .17 [.090, .26]$. Interestingly, more positivity toward others was similarly found to mediate the effects of EC on the same three outcome variables: behavioural intentions, $b = .055 [.007, .12]$, beliefs of intelligence, $b = .11 [.039, .18]$, and pity, $b = .17 [.089, .26]$). These findings suggest that compared to those in the control
condition, participants in the LKM and EC conditions were inclined to report more willingness to interact with, higher perceptions of the intelligence of, and more pity toward the hypothetical person with bipolar disorder, through the mediator of feeling more positively toward others.

However, more positivity toward others did not significantly mediate LKM’s effect on beliefs of dependence ($b = .019 [-.043, .081]$) and dangerousness ($b = .033 [-.018, .092]$), as well as emotional responses of anger ($b = -.005 [-.053, .039]$) and fear ($b = .012 [-.0586, .080]$). A similar pattern was observed for EC condition: more positivity toward others was not a significant mediator for dependence ($b = .018 [-.044, .079]$), dangerousness ($b = .032 [-.018, .089]$), anger ($b = -.005 [-.051, .038]$), and fear ($b = .012 [-.056, .080]$).

**Behavioural Intentions Toward the Confeder ate (Hypothesis 3b).** More positivity toward others significantly mediated the relationship between LKM and desire to participate in a follow-up study with the confederate, $b = .21 [.043, .43]$. Moreover, it was a significant mediator for EC as well, $b = .19 [.037, .39]$. See Figure 13.

**Negativity Toward Others**

Another unexpected finding was that negativity toward others was marginally lower in the EC condition relative to LKM and control conditions. Thus, it was tested as a potential mediator in lieu of intergroup anxiety for EC. Mediation analyses are reported below and in Table 15.

**Explicit Stigma Toward a Hypothetical Person (Hypothesis 1b).** Less negativity toward others was found to mediate the effects of EC on the following outcome variables, all reflecting self-reported stigma toward a hypothetical person with bipolar disorder in the vignette: anger, fear, beliefs of dependence and dangerousness (Figure 14). The relative indirect effects of LKM on these outcomes are as follows: anger, $b = -.03 [-.08, -.00]$, fear, $b = -.07 [-.13, -.02]$,
beliefs of dependence, $b = -.04 [-.10, -.01]$, and dangerousness, $b = -.04 [-.08, -.01]$. These post-hoc findings suggest that compared to those in the control condition, participants in the EC condition were more inclined to report less fear and anger toward, and lower perceptions of the dependence and dangerousness of, the hypothetical person with bipolar disorder through the mediator of feeling less negative toward others.

**Behavioural Intentions Toward Confederates (Hypothesis 3b).** More negativity toward others did not mediate the relationship between EC and desire to participate in a follow-up study with the confederate, $b = -.01 [-.10, .06]$.

In summary, more positivity toward others was a significant mediator of the effect of LKM on more positive behavioural intentions, beliefs of intelligence, and pity toward the hypothetical person, and willingness for future contact with the confederate; however, this was not the case for the outcome measures of beliefs of dependence and dangerousness, anger, and fear. Notable post-hoc findings indicated that EC was also associated with more positivity and less negativity toward others. Positivity toward others emerged as a significant mediator for the effect of EC on the same outcome variables as it did for LKM: beliefs of intelligence, pity toward the hypothetical person, and behavioural intentions toward the confederate. More negativity toward others was a significant mediator for the effect of EC on negative emotions and attitudes toward the hypothetical person: anger, fear, and beliefs of dependence and dangerousness.

**Exploratory Hypothesis (Hypothesis 4)**

To explore the affective-cognitive and cognitive-affective serial mediation pathways, only those outcome variables that revealed a significant main effect of the EC intervention were included. Thus, intelligence represented cognitive stigma, pity and anger represented affective...
stigma, and desire to participate in a follow-up study with the confederate represented behavioural stigma.

The indirect path of the EC condition on behavioural stigma thorough intelligence then anger was not significant $b = .061 [-.026, .22]$, and neither was the path through anger then intelligence, $b = .10 [-.001, .26]$. The indirect effect of the EC condition on behavioural stigma through intelligence then pity was not significant, $b = .012 [-.047, .088]$; the reverse path (i.e., pity-intelligence) was also not significant, $b = .077 [-.009, .21]$. Thus, in our sample, there was no evidence for either serial mediation pathway.
Table 3

Descriptive Statistics for Stigma Toward Bipolar Disorder

<table>
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<tr>
<th>Stigma Measure</th>
<th>N</th>
<th>Scale</th>
<th>M</th>
<th>SD</th>
<th>Skewness</th>
<th>Kurtosis</th>
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</thead>
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<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behavior intentions</td>
<td>375</td>
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<td>2.59</td>
<td>0.62</td>
<td>-0.12</td>
<td>0.08</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Dependent</td>
<td>376</td>
<td>1 - 5</td>
<td>1.95</td>
<td>0.85</td>
<td>1.02</td>
<td>0.74</td>
</tr>
<tr>
<td>Dangerous</td>
<td>372</td>
<td>1 - 5</td>
<td>2.48</td>
<td>0.71</td>
<td>0.54</td>
<td>0.31</td>
</tr>
<tr>
<td>Intelligent</td>
<td>375</td>
<td>1 - 5</td>
<td>2.63</td>
<td>0.97</td>
<td>0.05</td>
<td>-0.57</td>
</tr>
<tr>
<td>Affective stigma toward the hypothetical person</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anger</td>
<td>370</td>
<td>1 - 5</td>
<td>1.32</td>
<td>0.55</td>
<td>2.78</td>
<td>8.71</td>
</tr>
<tr>
<td>Pity</td>
<td>376</td>
<td>1 - 5</td>
<td>3.51</td>
<td>0.91</td>
<td>-0.41</td>
<td>-0.29</td>
</tr>
<tr>
<td>Fear</td>
<td>375</td>
<td>1 - 5</td>
<td>2.07</td>
<td>0.89</td>
<td>0.92</td>
<td>0.41</td>
</tr>
<tr>
<td>Implicit Stigma</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SC-IAT d-score</td>
<td>376</td>
<td>-</td>
<td>0.27</td>
<td>0.36</td>
<td>-0.24</td>
<td>-0.22</td>
</tr>
<tr>
<td>Affective Stigma toward the confederate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anger</td>
<td>337</td>
<td>1 - 5</td>
<td>1.05</td>
<td>0.27</td>
<td>7.79</td>
<td>66.95</td>
</tr>
<tr>
<td>Pity</td>
<td>340</td>
<td>1 - 5</td>
<td>2.09</td>
<td>0.91</td>
<td>0.70</td>
<td>-0.06</td>
</tr>
<tr>
<td>Fear</td>
<td>339</td>
<td>1 - 5</td>
<td>1.59</td>
<td>0.73</td>
<td>1.69</td>
<td>2.94</td>
</tr>
<tr>
<td>Behavioural stigma toward the confederate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behavioural intentions</td>
<td>330</td>
<td>Y/N</td>
<td>190a</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Confederate: negativity</td>
<td>323</td>
<td>1 - 5</td>
<td>1.49</td>
<td>0.58</td>
<td>1.20</td>
<td>0.49</td>
</tr>
<tr>
<td>Confederate: positivity</td>
<td>323</td>
<td>1 - 5</td>
<td>3.10</td>
<td>0.95</td>
<td>-0.17</td>
<td>-0.64</td>
</tr>
<tr>
<td>Coder: positivity</td>
<td>316</td>
<td>1 - 5</td>
<td>2.53</td>
<td>1.16</td>
<td>.25</td>
<td>-1.07</td>
</tr>
</tbody>
</table>

Note. Higher scores indicate more agreement/endorsement on the corresponding stigma measure.

a This cell indicates n of Yes responses. b Confederates’ rating of participants’ negativity and positivity. c Coders’ rating of participants’ positivity.
Table 4

**Correlation Matrix of Main Study Variables**

<table>
<thead>
<tr>
<th>Mediators</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>
<th>15</th>
<th>16</th>
<th>17</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Knowledge of bipolar disorder</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>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Positivity toward others</td>
<td>.12*</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>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Negativity toward others</td>
<td>-.14**</td>
<td>-.18**</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>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Stigma toward the hypothetical person | 4. Behavioural intentions | .19** | .15** | -.06 | -   |     |     |     |     |     |     |     |     |     |     |     |     |
|                                      | 5. Dependent               | -.17** | .00  | .16** | -.33** | -   |     |     |     |     |     |     |     |     |     |     |     |
|                                      | 6. Dangerous               | -.21** | .04  | .18** | -.40** | .56** | -   |     |     |     |     |     |     |     |     |     |     |
|                                      | 7. Intelligent             | .05  | .19** | .04  | .09  | .11* | .12* | -   |     |     |     |     |     |     |     |     |     |
|                                      | 8. Anger                   | -.18** | -.05 | .21** | -.34** | .42** | .41** | -.01 | -   |     |     |     |     |     |     |     |     |
|                                      | 9. Pity                    | .10  | .26** | .00  | .20** | .09  | .13* | .17** | -.06 | -   |     |     |     |     |     |     |     |
|                                      | 10. Fear                   | -.11* | .01  | .25** | -.45** | .45** | .58** | .04  | .61** | .11* | -   |     |     |     |     |     |     |
|                                      | 11. Implicit stigma        | -.10 | .00  | -.01 | -.23** | .14** | .13* | -.02 | .16** | -.02 | .16** | -   |     |     |     |     |     |

| Stigma toward the confederate | 12. Anger                  | -.06 | -.10 | .30** | -.16** | .15** | .15** | .00  | .27** | -.06 | .16** | .00  | -   |     |     |     |     |
|                               | 13. Pity                   | -.05 | .07  | .15** | .06  | .15** | .13* | .09  | .21** | .32** | .23** | .00  | .28** | -   |     |     |     |
|                               | 14. Fear                   | -.10 | -.03 | .18** | -.03 | .12* | .19** | .06  | .22** | .07  | .26** | .00  | .38** | .24** | -   |     |     |
|                               | 15. Behavioural intentions | .11* | .17** | .01  | .29** | -.09 | -.10 | .06  | -.10 | .06  | -.16** | -.10 | .02  | .10  | -.02 | -   |     |
|                               | 16. Confederate: negativity | .03  | -.08 | .03  | -.08 | .02  | .01  | .08  | .02  | -.02 | .06  | -.02 | -.01 | -.05 | .17** | -.04 | -   |
|                               | 17. Confederate: positivity | .05  | .18** | -.14** | .06  | -.02 | .01  | -.01 | -.02 | .06  | -.09 | .04  | -.08 | .06  | -.11* | .09  | -.27** | -   |
|                               | 18. Coder: positivity      | .08  | .16** | -.14* | .06  | -.07 | -.07 | -.03 | -.06 | .04  | -.08 | .04  | -.15** | -.01 | -.07 | .14** | -.19** | .33** |

* p < .05, ** p < .01
Table 5

*Skewness and Kurtosis Following Transformations*

<table>
<thead>
<tr>
<th></th>
<th>Skewness</th>
<th></th>
<th>Kurtosis</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Original</td>
<td>log</td>
<td>log *2</td>
<td>Original</td>
</tr>
<tr>
<td>Explicit stigma toward a hypothetical person</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dependent</td>
<td>1.02</td>
<td>0.23</td>
<td>0.003</td>
<td>0.74</td>
</tr>
<tr>
<td>Anger</td>
<td>2.78</td>
<td>1.79</td>
<td>1.53</td>
<td>8.71</td>
</tr>
<tr>
<td>Affective stigma toward the confederate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anger</td>
<td>7.79</td>
<td>6.41</td>
<td>6.00</td>
<td>66.95</td>
</tr>
<tr>
<td>Fear</td>
<td>1.69</td>
<td>.88</td>
<td>.66</td>
<td>2.94</td>
</tr>
<tr>
<td>Confederate’s impression of the participant</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negativity</td>
<td>1.20</td>
<td>.76</td>
<td>.61</td>
<td>0.49</td>
</tr>
</tbody>
</table>

*Note.* Original values indicate means for each of the subscale.
Table 6

**Descriptive Statistics for Participant Characteristics**

<table>
<thead>
<tr>
<th>Participant Characteristic</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Familiarity with bipolar disorder</td>
<td>147</td>
<td>39</td>
</tr>
<tr>
<td>Mental illness diagnosis</td>
<td>107</td>
<td>28</td>
</tr>
<tr>
<td>- Bipolar disorder</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>- Other</td>
<td>84</td>
<td>22</td>
</tr>
<tr>
<td>- Prefer not to state</td>
<td>17</td>
<td>5</td>
</tr>
<tr>
<td>Familiarity with presenter</td>
<td>82</td>
<td>22</td>
</tr>
<tr>
<td>- Aware of diagnosis</td>
<td>46</td>
<td>12</td>
</tr>
<tr>
<td>Mindfulness practice experience</td>
<td>179</td>
<td>48</td>
</tr>
<tr>
<td>- Rarely</td>
<td>115</td>
<td>31</td>
</tr>
<tr>
<td>- Monthly</td>
<td>23</td>
<td>6</td>
</tr>
<tr>
<td>- Once a week</td>
<td>17</td>
<td>5</td>
</tr>
<tr>
<td>- 2-3 times a week</td>
<td>15</td>
<td>4</td>
</tr>
<tr>
<td>- Almost every day</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>- Every day</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Sociability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shyness</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* N = 376. Percentage calculated from the total N. Sociability and shyness were measured on a 5-point Likert scale (1 = *very uncharacteristic* or *untrue*; 5 = *very characteristic* or *true*).

Table 7

**Participants’ Evaluation of the Experimental Video**

<table>
<thead>
<tr>
<th>Range</th>
<th>M (SD)</th>
<th>EC</th>
<th>LKM</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video engagement</td>
<td>1 - 5</td>
<td>3.43 (0.75)(^a)</td>
<td>3.55 (0.95)(^a)</td>
<td>2.20 (0.75)(^b)</td>
</tr>
<tr>
<td>Feelings toward the presenter</td>
<td>0 - 100</td>
<td>70.89 (19.59)(^a)</td>
<td>70.70 (20.91)(^a)</td>
<td>44.76 (20.95)(^b)</td>
</tr>
</tbody>
</table>

*Note.* Higher numbers indicate higher engagement and more positivity/warmth.
Table 8

Descriptive Statistics for Manipulation Check Variables

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Range</th>
<th>EC M</th>
<th>EC SD</th>
<th>LKM M</th>
<th>LKM SD</th>
<th>Control M</th>
<th>Control SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge of bipolar disorder</td>
<td>376</td>
<td>1 - 20</td>
<td>13.58a</td>
<td>3.19</td>
<td>8.21b</td>
<td>2.46</td>
<td>7.93b</td>
<td>2.42</td>
</tr>
<tr>
<td>Positivity toward self</td>
<td>365</td>
<td>1 - 5</td>
<td>3.22a</td>
<td>0.86</td>
<td>3.38a</td>
<td>1.02</td>
<td>2.82b</td>
<td>0.96</td>
</tr>
<tr>
<td>Positivity toward others</td>
<td>365</td>
<td>1 - 5</td>
<td>3.57a</td>
<td>0.75</td>
<td>3.59a</td>
<td>0.86</td>
<td>3.01b</td>
<td>0.98</td>
</tr>
<tr>
<td>Negativity toward self</td>
<td>365</td>
<td>1 - 5</td>
<td>1.40a</td>
<td>0.72</td>
<td>1.32a</td>
<td>0.73</td>
<td>1.44a</td>
<td>0.67</td>
</tr>
<tr>
<td>Negativity toward others</td>
<td>365</td>
<td>1 - 5</td>
<td>1.14a</td>
<td>0.41</td>
<td>1.21ab</td>
<td>0.51</td>
<td>1.29b</td>
<td>0.55</td>
</tr>
</tbody>
</table>

*Note.* Means that do not share superscripts within columns are significantly different at p < .01.

Table 9

Means and Standard Deviations for Explicit and Implicit Stigma

<table>
<thead>
<tr>
<th></th>
<th>EC (N = 113)</th>
<th>LKM (N = 126)</th>
<th>Control (N = 124)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Behavioural intentions</td>
<td>2.66a</td>
<td>.59</td>
<td>2.63a</td>
</tr>
<tr>
<td>Dependent</td>
<td>1.86a</td>
<td>.72</td>
<td>1.89a</td>
</tr>
<tr>
<td>Dangerous</td>
<td>2.35a</td>
<td>.69</td>
<td>2.49a</td>
</tr>
<tr>
<td>Intelligient</td>
<td>2.82a</td>
<td>1.08</td>
<td>2.65ab</td>
</tr>
<tr>
<td>Anger</td>
<td>1.21a</td>
<td>.36</td>
<td>1.31ab</td>
</tr>
<tr>
<td>Pity</td>
<td>3.68a</td>
<td>.83</td>
<td>3.39b</td>
</tr>
<tr>
<td>Fear</td>
<td>2.06a</td>
<td>.78</td>
<td>1.99a</td>
</tr>
<tr>
<td>Implicit stigma</td>
<td>.27a</td>
<td>.35</td>
<td>.26a</td>
</tr>
</tbody>
</table>

*Note.* Means that do not share superscripts within columns are significantly different at p < .01.

a Social Distance Scale used a 4-point Likert Scale, 1 = definitely unwilling; 4 = definitely willing. 
b Personal Attribute Scale used a 5-point Likert Scale, 1 = definitely not true; 5 = definitely true. 
c Emotional Reaction to Mental Illness Scale used a 5-point Likert Scale, 1 = not at all; 5 = very much. 
d Single Category Implicit Attitudes Test yielded a d-score. 0.15 < d-score < 0.35 indicates a moderate preference for bipolar and negative attribute word pairings.
Table 10

*Means and Standard Deviations for Affective Stigma Toward the Confederate*

<table>
<thead>
<tr>
<th></th>
<th>EC (N = 108)</th>
<th></th>
<th>LKM (N = 108)</th>
<th></th>
<th>Control (N = 105)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Anger</td>
<td>1.02</td>
<td>.11</td>
<td>1.04</td>
<td>.29</td>
<td>1.08</td>
<td>.36</td>
</tr>
<tr>
<td>Pity</td>
<td>2.02</td>
<td>.87</td>
<td>2.11</td>
<td>.93</td>
<td>2.13</td>
<td>.93</td>
</tr>
<tr>
<td>Fear</td>
<td>1.46</td>
<td>.62</td>
<td>1.62</td>
<td>.71</td>
<td>1.68</td>
<td>.82</td>
</tr>
</tbody>
</table>

*Note.* Emotional Reaction toward Confederate Scale used a 5-point Likert Scale, 1 = *not at all*; 5 = *very much*.

Table 11

*Condition by Follow-up Study Participation Contingency Table*

<table>
<thead>
<tr>
<th></th>
<th>Participation in Follow-up study</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No (%)</td>
</tr>
<tr>
<td>EC</td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td>43&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>% within Condition</td>
<td>39.80%</td>
</tr>
<tr>
<td>% within FU study</td>
<td>28.70%</td>
</tr>
<tr>
<td>LKM</td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td>45&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>% within Condition</td>
<td>40.90%</td>
</tr>
<tr>
<td>% within FU study</td>
<td>30.00%</td>
</tr>
<tr>
<td>Control</td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td>62&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>% within Condition</td>
<td>55.40%</td>
</tr>
<tr>
<td>% within FU study</td>
<td>41.30%</td>
</tr>
</tbody>
</table>

*Note.* Each subscript letter denotes a subset of follow-up (FU) study categories whose column proportions do not differ significantly from each other at the .05 level.
Table 12

Means and Standard Deviations for Interaction Task Variables

<table>
<thead>
<tr>
<th></th>
<th>EC (N = 104)</th>
<th>LKM (N = 105)</th>
<th>Control (N = 103)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Confederate: Negativity</td>
<td>1.50</td>
<td>.59</td>
<td>1.45</td>
</tr>
<tr>
<td>Confederate: Positivity</td>
<td>3.14</td>
<td>.97</td>
<td>3.16</td>
</tr>
<tr>
<td>Coder: Positivity</td>
<td>2.51</td>
<td>1.18</td>
<td>2.70</td>
</tr>
</tbody>
</table>

Note. Confederates and coders rated their impression of the participants’ positivity and negativity on a 5-point Likert scale, 1 = not at all; 5 = extremely. None of the means were significantly different from each other.
Table 13

Mediation Analyses with Knowledge of Bipolar Disorder as the Mediator

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Mediator</th>
<th>Stigma Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Path</td>
<td>$b$</td>
</tr>
<tr>
<td>Stigma toward the hypothetical person</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behavioural Intentions</td>
<td>$a_{EC}$</td>
<td><strong>5.68</strong></td>
</tr>
<tr>
<td></td>
<td>$a_{LKM}$</td>
<td>.30</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dependent</td>
<td>$a_{EC}$</td>
<td><strong>5.66</strong></td>
</tr>
<tr>
<td></td>
<td>$a_{LKM}$</td>
<td>.28</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intelligent</td>
<td>$a_{EC}$</td>
<td><strong>5.66</strong></td>
</tr>
<tr>
<td></td>
<td>$a_{LKM}$</td>
<td>.24</td>
</tr>
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<td></td>
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<tr>
<td>Dangerous</td>
<td>$a_{EC}$</td>
<td><strong>5.67</strong></td>
</tr>
<tr>
<td></td>
<td>$a_{LKM}$</td>
<td>.29</td>
</tr>
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<tr>
<td>Anger</td>
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<td></td>
<td>$a_{LKM}$</td>
<td>.24</td>
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<td></td>
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<tr>
<td>Pity</td>
<td>$a_{EC}$</td>
<td><strong>5.66</strong></td>
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<tr>
<td></td>
<td>$a_{LKM}$</td>
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<td>Fear</td>
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<td>$a_{LKM}$</td>
<td>.32</td>
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<td>$a_{LKM}$</td>
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</table>

Note. The confidence interval is a 95-percentile bootstrap CI based on 10000 samples. C path denotes the total effect and c’ path denotes the direct effect. Statistically significant values are bolded.

* The PROCESS macro does not run the total effect model for dichotomous criterion variable.

*p < .05. **p < .01.
### Table 14

**Mediation Analyses with Positivity Toward Others as the Mediator**

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Mediator</th>
<th>Stigma Variable</th>
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<td>Path</td>
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</tr>
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<td>a_{LKM}</td>
<td>.60**</td>
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<td>a_{EC}</td>
<td>.58**</td>
</tr>
<tr>
<td></td>
<td>a_{LKM}</td>
<td>.58**</td>
</tr>
<tr>
<td><strong>Dangerous</strong></td>
<td>a_{EC}</td>
<td>.58**</td>
</tr>
<tr>
<td></td>
<td>a_{LKM}</td>
<td>.59**</td>
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<td>.58**</td>
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<tr>
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<td>.59**</td>
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<tr>
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<td>.59**</td>
</tr>
<tr>
<td></td>
<td>a_{LKM}</td>
<td>.60**</td>
</tr>
<tr>
<td><strong>Pity</strong></td>
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<td>.58**</td>
</tr>
<tr>
<td></td>
<td>a_{LKM}</td>
<td>.59**</td>
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<td></td>
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<td>.65**</td>
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**Note.** The confidence interval is a 95-percentile bootstrap CI based on 10000 samples. C path denotes the total effect and c' path denotes the direct effect. Statistically significant values are bolded.

*a The PROCESS macro does not run the total effect model for dichotomous criterion variable.

*p < .05. **p < .01.
### Table 15

**Mediation Analyses with Negativity Toward Others as the Mediator**

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Mediator</th>
<th>Stigma Variable</th>
</tr>
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<tr>
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<td>CI</td>
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<td>Behavioural Intentions</td>
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<td></td>
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<tr>
<td>ec</td>
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</tr>
<tr>
<td>alkm</td>
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<td>[.28, -.03]</td>
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<td>alkm</td>
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<td>[.28, -.03]</td>
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<tr>
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<td>ec</td>
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<td>alkm</td>
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<tr>
<td>Fear</td>
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<td>ec</td>
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<td>alkm</td>
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<td>Stigma toward the</td>
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<tr>
<td>Behavioural Intentions</td>
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<tr>
<td>ec</td>
<td>-14*</td>
<td>[.27, -.01]</td>
</tr>
<tr>
<td>alkm</td>
<td>-.08</td>
<td>[.20, .05]</td>
</tr>
</tbody>
</table>

**Note.** The confidence interval is a 95-percentile bootstrap CI based on 10000 samples. C path denotes the total effect and c’ path denotes the direct effect. Statistically significant values are bolded.

* The PROCESS macro does not run the total effect model for dichotomous criterion variable.

*p < .05. **p < .01.
Figure 7

Cognitive and Affective Stigma Toward the Hypothetical Person

Note. Cognitive and affective stigma toward the hypothetical person with bipolar disorder are shown for EC, LKM, and control conditions. Cognitive stigma scale measured participants’ belief that the hypothetical was dependent, dangerous, and intelligent on a 5-point Likert scale (1 = definitely not true; 5 = definitely true). Affective stigma measured participants’ anger, pity and fear toward the hypothetical person (1 = not at all; 5 = very much). Error bars show standard deviations. Only the significant difference between two groups are noted.

* p < .05, ** p < .01.
Figure 8

*Behavioural Intentions Toward the Hypothetical Person*

![Graph showing behavioural intentions towards a hypothetical person with bipolar disorder across EC, LKM, and control conditions.](image)

*Note.* Behavioural intentions toward the hypothetical person with bipolar disorder are shown for EC, LKM, and control conditions. A 4-point Likert scale (1 = *definitely unwilling*; 5 = *definitely willing*). Error bars show standard deviations. There were no significant differences across the groups.
Affective and Behavioural Stigma Toward the Confederate

**Figure 9**

*Note.* Affective stigma toward the confederate are shown for EC, LKM, and control conditions. Confederates’ ratings of participants’ negativity and positivity, and coder’s rating of participants’ positivity are shown for each of the condition. All measures used a 5-point Likert scale. Higher rating indicates higher endorsement of the outcome variable. Error bars show standard deviations. There were no significant differences across the groups.
Figure 10

*Behavioural Intention Toward the Confederate*

![Bar chart showing the distribution of responses to participating in a follow-up study with the confederate.](chart)

*Note.* Counts indicate participants’ responses of “Yes” or “No” to participating in a follow-up study with the confederate. Participants in the control group were more likely to decline participating in a follow-up study with the confederate, relative to EC and LKM.
**Figure 11**

Mediating Effect of Knowledge of Bipolar Disorder on Explicit Stigma Toward the Hypothetical Person


Note. Significant indirect effects of EC via knowledge of bipolar disorder were found for the listed stigma outcomes toward a hypothetical person.

** p <.001.
Figure 12

Mediating Effect of Positivity Toward Others on Explicit Stigma Toward the Hypothetical Person

Note. Significant indirect effects of LKM and EC via higher positivity toward others were found for the listed stigma outcomes toward the hypothetical person.

** $p < .001$. * $p < .05$
Figure 13

Mediating Effect of Positivity Toward Others on Behavioural Intentions Toward the Confederate

Note. Significant indirect effects of EC and LKM via positivity toward others was found for behavioural intentions toward the confederate.

* $p < .05$
Mediating Effect of Negativity Toward Others on Explicit Stigma Toward the Hypothetical Person

Note. Significant indirect effects of EC via lower negativity toward others were found for the listed stigma outcomes toward the hypothetical person.

** p < .001. * p < .05
Discussion

The results of this study provide insight into improving the efficacy of mental illness stigma interventions by comparing LKM (a novel mindfulness-based intervention approach), EC (a commonly studied intervention containing education and contact), and a control condition, on reducing stigma toward bipolar disorder. Cognitive, affective, and behavioural stigma toward a hypothetical person and a real-life confederate (ostensibly diagnosed with bipolar disorder) were measured using self-report, implicit, and observational measures.

Obtaining participants’ self-report of explicit stigma toward a hypothetical person with mental illness described in a vignette has been the most common way of measuring stigma in the literature to date. On this type of measure, the EC intervention performed significantly better than the control condition in aspects of cognitive (higher beliefs of intelligence) and affective (lower anger) stigma, although it did not differ on beliefs of dependence and dangerousness, feelings of pity and fear, and behavioural intentions toward a hypothetical person with bipolar disorder. For most of these outcomes, LKM was not statistically different from either EC or the control condition.

The current study also expanded the existing literature to test intervention effects on a measure of implicit stigma. Contrary to the hypothesis, EC, LKM, and control conditions did not differ in terms of implicit stigma toward bipolar disorder.

A novel contribution of this study was the inclusion of affective and behavioural stigma measures toward a confederate, representing a real-life person who ostensibly had bipolar disorder. On this real-life outcome measure, both EC and LKM conditions led to participants demonstrating more positive behavioural intentions toward the confederate (willingness to participate in a follow-up study), relative to the control condition. However, there were no
differences between conditions in participants’ report of affective stigma toward the confederate. Nor were there differences between conditions in perceived (by the confederate) and observed (by coders) behavioural stigma toward the confederate.

This study also addressed a critical question of how EC and LKM might have reduced stigma of bipolar disorder. Grounded in intergroup relations theory, I tested knowledge of bipolar disorder, positivity toward others, and negativity toward others as mediators. The EC condition reduced stigma of bipolar disorder through the participants having more knowledge of bipolar disorder and more positivity toward others, and having less negativity toward others, whereas LKM reduced stigma through participants having more positivity toward others.

**Efficacy of Interventions on Reducing Stigma of Bipolar Disorder**

Overall, both EC and LKM intervention conditions were efficacious in reducing some expressions of stigma, but not all, toward both a hypothetical and real-life person with bipolar disorder, relative to the control condition.

**Explicit Stigma toward a Hypothetical Person**

**Cognitive Stigma.** Cognitive stigma was measured by assessing participants’ beliefs regarding a hypothetical person with bipolar disorder’s intelligence, dependence, and dangerousness. As expected, EC resulted in higher beliefs about intelligence compared to the control condition. Although LKM was associated with higher beliefs of intelligence than the control condition and lower beliefs of intelligence than the EC condition, the mean was not statistically different relative to the EC and control conditions. Contrary to predictions, beliefs of dependence and dangerousness did not differ across the three conditions, suggesting that neither EC nor LKM was efficacious for targeting these beliefs. Given that the content of the educational component was written to include information to target all three of these beliefs specifically and
explicitly (see Appendix A for the full script), the significant finding for intelligence but not for 
dependence and dangerousness warrants further consideration.

This pattern of findings may be due to Dr. Barnes’ being the presenter of the EC video. Dr. Barnes’ personal story may have particularly strengthened beliefs of intelligence, as he attended university, obtained a doctoral degree, and became a faculty member at a leading university - all despite the challenges of being diagnosed with bipolar disorder. In contrast, stereotypes about dependence and dangerousness were not specifically refuted or discussed during Dr. Barnes’ recounting of his personal experience. This finding might suggest that educational content that challenges misconceptions are most effective in changing beliefs when provided by an individual who has lived experience and can speak to these stereotypes specifically. Thus, perhaps Dr. Barnes speaking about personal experiences that directly challenge misconceptions related to dependence and dangerousness would have had led to significant decreases in these beliefs.

The potential negative impact of positive stereotypes (i.e., intelligence) should be considered, especially in the absence of a decrease in negative stereotypes (i.e. dependence and dangerousness). This consideration is especially relevant for bipolar disorder, as it tends to be associated with positive attributions, unlike depression and schizophrenia (Ellison, Mason, & Scior, 2015). When positive stereotypes are expressed, they may be intended as compliments, but the downside is that the targets of such stereotypes may feel depersonalized (i.e., reduced to their membership to the group) or feel pressured to perform according to the stereotype (Czopp et al., 2015). Thus, efforts to reduce stigma of mental illness should not only focus on increasing positive beliefs and reducing negative beliefs, but on emphasizing humanizing approaches, such as raising awareness about the variability across individuals diagnosed with mental illnesses.
**Affective Stigma.** Affective stigma was comprised of anger, fear, and pity toward a hypothetical person with bipolar disorder. Contrary to the predictions, the EC condition fared slightly better than both LKM and control in reducing one aspect of affective stigma: anger. Participants who received EC expressed significantly less anger than those in the control condition. Although, on average, the participants in the LKM condition were less angry toward the hypothetical person than those in the control condition and higher on anger than those in the EC condition, the means were not statistically different. Regarding fear, the EC and LKM conditions did not differ from the control condition, and participants reported moderately low levels of fear toward the hypothetical person with bipolar disorder. Lastly, pity toward the hypothetical person with bipolar disorder was higher in EC than in the LKM condition; however, both EC and LKM were not significantly different from the control condition. The practical implications of these significant and nonsignificant results require further exploration.

On average, participants endorsed “a little” for fear and “not at all” for anger. The low endorsement of these emotions raises the question of whether anger and fear are meaningful markers of affective stigma toward bipolar disorder. One possibility is that the participants underreported the intensity of these emotions due to social desirability concerns. In a telephone survey conducted by Bell Let’s Talk (2015) with randomly selected Canadian adults, 57% of the respondents believed that stigma has reduced since 2010, and 70% believed that attitudes about mental health issues have changed for the better since 2010. These statistics reflect respondents’ perceptions of public attitudes toward mental illness and the prevalence of stigma, not necessarily their personal attitudes. Therefore, people in modern society may have a general impression that it is inappropriate to express prejudice against mental illness publicly. If this presumption is true, then alternative ways of measuring affective stigma that do not rely upon
explicit self-report are needed to reduce social desirability pressures, such as implicit or observational measures.

Another possibility might be that participants genuinely did not feel anger or fear toward the hypothetical person. I speculate that there may be a few reasons for this. First, individuals may feel less angry toward and fearful of someone with bipolar disorder due to the increased awareness of bipolar disorder and mental illness in our society. The low endorsement of fear and anger, however, does not necessarily mean that other manifestations of affective stigma are nonexistent. Instead, stigma is likely to prevail in more subtle and passive forms, such as expressions of disinterest in, apathy toward, or lack of care for individuals with mental illness. These other forms of affective prejudice may exist and warrant further exploration. In racial prejudice research, the absence of sympathy for outgroup members is an acknowledged subtle form of prejudice (Pettigrew & Meertens, 1995). Forman (2004) furthered this idea and formulated that the absence of human-heartedness or denial of care represent prejudice, and speculated that these attitudes reflect a subtle distaste for outgroup members rather than a genuine lack of caring.

To explore these ideas further, future studies might expand the range of emotions measured and include measures of negative emotions that are less extreme and intense, such as indifference, disinterest, and annoyance, in addition to anger and fear. The measurement of these emotions may also be a way to get around social desirability issues, as respondents may feel less reluctant to endorse statements such as, “I feel bad for people struggling with mental illness, but I cannot take on other people’s problems” compared to “I feel angry toward people with mental illness.” Furthermore, it may capture more variability in the affective responses.

Another possibility might be that the low endorsement for anger and fear is specific as a response to the hypothetical person, as this fictional figure does not pose any immediate threat or
hold personal significance to the participants. If this is the case, participants may feel differently toward a real-life person with bipolar disorder. This possibility will be further explored in the following section addressing the study findings on stigma toward the confederate.

Studies based on the attributional theory (Weiner et al., 1988) have often depicted pity, relative to anger, as a more favourable emotional reaction to individuals with mental illness. For example, pity elicits helping behaviour, while anger does not. Pity and fear, however, are similar in that they are both associated with increased endorsement of beliefs that individuals with mental illness should be coerced into treatment and segregated from society (Corrigan et al., 2003). Even when pity elicits a desire to help and protect, this may implicitly reinforce the idea that a pitied group is of “lower status” and, ultimately, be harmful for the perception of the pitied individual (Cuddy et al., 2007). Although pity was lower in LKM than in the EC condition, both groups were not significantly different from the control condition. The mixed research about whether pity is a desirable intervention outcome may have influenced the lack of group differences in this outcome measure.

**Behavioural Intentions.** Contrary to the hypothesis, neither EC nor LKM was associated with a higher intention to engage with a hypothetical person with bipolar disorder, compared to the control group. On average, participants across all conditions responded within the range of “probably unwilling” to “probably willing,” suggesting that they did not have a strong preference for distancing or engaging with the hypothetical person. This apparent ambivalence may be partly due to similar reasons as speculated for affective stigma. First, it may be due to social desirability concerns. Another reason may be that the vignette measure did not evoke a sufficiently strong desire to either interact with or avoid the hypothetical person in contrived situations. Given how little the participants know about the hypothetical person and how
inauthentic the scenario is, participants may have found it genuinely challenging to have a well-formed opinion about their willingness to have the hypothetical person in the vignette “marry into my family,” for instance. I aimed to address some of these limitations of a vignette measure by also measuring participants’ willingness to interact with the confederate in a follow-up study; the implications of the findings are elaborated below.

Immediately, behavioural intentions toward the hypothetical person with bipolar disorder were significantly correlated with other indices of cognitive and affective stigma (except beliefs of intelligence) toward the same hypothetical person and with implicit stigma. Across the conditions, higher intentions to interact with the hypothetical person was associated with lower endorsement of beliefs of dependence and dangerousness, feelings of anger and fear, and implicit stigma, and also associated with higher pity. The significant correlations indicate convergent validity across these stigma components.

**Implicit Stigma**

LKM was tested as a novel intervention for targeting implicit bias toward bipolar disorder, in response to some evidence in the existing literature that contact and education strategies are ineffective in reducing implicit stigma of mental illness. Contrary to the hypothesis, LKM was not efficacious in reducing implicit stigma toward bipolar disorder. Although the pattern of the d-scores placed participants in LKM at the lowest amount of bias against bipolar disorder across the three conditions, all three d-scores were within a “moderate” range for bias toward bipolar disorder (d-score > 0.35). Furthermore, the difference between the conditions was negligible, as EC was 0.01 points higher than LKM, and the control condition was 0.02 points higher than LKM. Thus, neither intervention was successful at targeting implicit stigma toward bipolar disorder.
Although nonsignificant, this finding does not rule out the potential of LKM as a viable option for reducing implicit stigma of mental illnesses. The current study result may be due to a few factors, such as the length of the LKM session or the instructions provided for the LKM practice. In the present study, participants in the LKM condition completed 15-minutes of guided LKM practice in a laboratory setting. Toward the last part of the meditation, they were instructed to direct loving-kindness to all beings. In other words, bipolar disorder was not targeted during the practice of LKM. This non-targeted instruction was intentional as the purpose was to test whether compassion toward others in general would also impact one’s attitudes toward a specific group (i.e., those with bipolar disorder). Another reason for not specifying a target group was to reduce the potential of a priming effect or suspiciousness in participants about the aim of the study.

Notably, a brief LKM intervention might be more effective in reducing implicit attitudes toward a specific group when loving-kindness is explicitly and specifically directed toward this group during the meditation. In a study testing the effects of a 7-minute LKM intervention, Hutcherson et al. (2008) provided pictures of neutral target strangers and instructed the participants to direct feelings of love and compassion toward them. Results indicated that the specificity of the loving-kindness instructions led to increased implicit positivity toward the neutral target strangers; however, there was no change in implicit positivity toward nontarget neutral strangers (i.e., strangers whom participants did not see a picture of during LKM). However, another notable difference in Hutcherson et al. (2008) relative to the current study was that the target individual was a neutral stranger who did not belong to a stigmatized social group. Therefore, an instruction to direct loving-kindness toward a person with bipolar disorder (a
member of a stigmatized group) may still not have affected implicit stigma toward people with this condition.

Similar to this study, Kang et al. (2014) instructed the participants to extend loving-kindness to all beings. Their results indicated that even without specifying Black or homeless people during LKM practice, implicit biases toward both groups were significantly reduced. The critical difference, however, was that their LKM intervention consisted of six weekly LKM classes, which included a 30-minute sitting meditation, check-ins about participants’ progress with their meditative practices, answering questions, and open discussions among participants and leaders. Participants were also assigned in-between session homework of 20 minutes of practice for 5 days a week. Therefore, a single 15-minute session of LKM (the length of the intervention for the current study) may have been an insufficient dose to reduce participants’ implicit stigma. Despite some of the notable challenges of the brief 15-minute LKM intervention, that it still led to significant improvements in positivity toward others and behavioural intentions toward the confederate is encouraging. Future studies should explore whether a longer and multi-session LKM intervention will result in changes in implicit stigma about mental illness.

Beyond exploring the efficacy of LKM on implicit stigma, broadly examining the relationship between the explicit and implicit stigma measures highlights some essential questions regarding implicit stigma as a construct and validity of its measurement. The current study used the SC-IAT instead of the traditional IAT. The traditional IAT typically uses physical illness as a complementary target group to mental illness, whereas the SC-IAT does not employ a comparison group. The SC-IAT has been validated against the IAT as a suitable measure of implicit bias (Karpinski & Steinman, 2006); however, the convergent validity of both tasks for
measuring implicit stigma toward mental illness has not been tested. Although both tasks purport to measure implicit stigma, there may be meaningful differences in what each task is measuring due to the apparent differences in that one task employs a comparison group and the other does not in the calculation of d-scores.

A pattern appears to emerge when surveying studies examining the relationship between implicit and explicit stigma toward mental illness. When implicit stigma was measured using the SC-IAT, as in this study and Brener et al. (2013a)’s study, a significant correlation was found between implicit stigma and explicit stigma toward mental illness. In contrast, when implicit stigma was measured using the IAT, a nonsignificant relationship was found between implicit and explicit stigma, suggesting that the distinctiveness of the two types of stigma (González-Sanguino et al., 2019; Teachman et al., 2006). This mixed finding mirrors the general pattern of evidence suggesting that implicit and explicit biases are related at times and unrelated at other times (Nosek et al., 2002). The mixed findings regarding the relationship between implicit and explicit stigma warrant further investigation. A future study might use both the SC-IAT and the IAT to measure implicit attitudes and also examine how each d-score is associated with explicit measures of stigma to explore the convergent validity of the implicit measures for mental illness stigma.

**Stigma Toward the Confederate**

To address some of the shortcomings of vignette-based measures of stigma, this study attempted to assess stigma toward a real-life confederate who ostensibly has bipolar disorder. I hypothesized that LKM would be more efficacious than EC in reducing affective and behavioural stigma toward the confederate and that both EC and LKM would be more efficacious than the control condition.
As hypothesized, both EC and LKM interventions were associated with a higher desire to interact with the confederate with bipolar disorder in the future (i.e., participate in a research study involving relationship-building exercises) than the control condition. Specifically, 60.2% of participants in the EC condition, 59.1% of participants in the LKM condition, and 44.6% of participants in the control condition volunteered to interact further with the confederate.

One strength of this behavioural intentions measure was that participants responded about a realistic and specific future encounter (i.e., participating in a research study together) with a real-life person, rather than a generic and potentially contrived situation (e.g., living next to, working closely with) involving a hypothetical person in a vignette. Despite these differences, behavioural intentions toward a real-life confederate were positively correlated with behavioural intentions toward the hypothetical person with bipolar disorder, supporting the validity of this measure. Further, this finding suggests the potential utility of more ecologically valid measures of stigma than the typically used social distance measure involving hypothetical vignettes. As behavioural stigma is hard to measure in vivo, the use of this measure was one attempt to capture an aspect of real-life behavioural intentions, which may be closer to individuals’ discriminatory behaviour than are behavioural intentions toward a hypothetical person in a vignette.

Neither LKM nor EC reduced self-reported affective stigma (i.e., fear, anger, pity) expressed toward the confederate, which was similar to the findings obtained for affective stigma toward the hypothetical person. Furthermore, participants appeared to have responded similarly to the confederate and the hypothetical person. That is, the emotional reaction toward the confederate was significantly correlated with the same emotion expressed toward the hypothetical person with bipolar disorder. Similar to responses toward a hypothetical person, the modal responses for all three aspects of affective stigma were “not at all.” In general, participants
did not particularly feel intense pity, anger, or fear toward a confederate they had just met and interacted with for a short task. As with the vignette measure, it is possible that none of these emotions were strongly evoked during the interaction, or that even if they were, participants were not likely to report due to social desirability factors. This finding further adds to the idea that the measurement of affective stigma should be expanded beyond the three typical and extreme emotions, anger, fear, and pity, to emotions such as apathy and disinterest.

As the measurement of actual behaviours has been scarce in stigma literature, impression ratings by the confederate and observational coding completed by naïve coders were included as measures of behavioural stigma. Findings, however, indicated no differences across conditions for behavioural stigma perceived by either the confederate or observers. Whether the interventions failed to reduce behavioural stigma or whether the nonsignificant results were due to a measurement flaw requires further investigation.

Thin-slice judgments captures the process of intuitive and automatic inferences made from glimpses of a social interaction, which can sometimes be more accurate than deliberate and elaborate judgments (Ambady, 2010). Unfortunately, the low inter-rater reliability in the thin-slice coding of negativity toward the confederate suggests significant variability in how negativity was perceived by the coders. Cordaro et al. (2018) reported that cultural variation exists in expressions and perceptions of emotions. In particular, they noted that emotions relevant for conveying social information, such as interest, sympathy, boredom, and anger, were least consistent across cultures in how participants expressed them. They hypothesized that this was due to the variability in cultural norms and values that shape these emotions. Moreover, social desirability factors may have also played a role in how the participants conducted themselves during the interaction to make their negative behaviours subtle. While it is more
socially acceptable to convey warmth, it is not desirable to outwardly convey dislike or even a lack of interest to a fellow participant, especially when being filmed. These variations in how participants express negative emotions, combined with participants’ tendency to suppress expression of negative emotions, may have made it more difficult for coders to detect this behaviour reliably.

The reliability of thin-slice coding for assessing behavioural stigma might be improved with coders who have diagnoses of mental illness. As they are likely to have lived experience of disclosing their mental illness to another person, they might have a heightened awareness and perceptivity to the presence of subtle cues of bias in such interactions. In a study looking at the predictive value of a thin-slice coding of a 20-second interaction on implicit and explicit racial bias, the researchers had Black and White coders make judgments of an interaction between a White participant and a Black confederate (Richeson & Shelton, 2005). Relative to the White coders, the Black coders’ thin-slice ratings were better predictors of the White participants’ implicit and explicit racial bias scores (Richeson & Shelton, 2005).

Another potential flaw in the interaction task measure is that participants’ ability to act without prejudice may have varied throughout the interaction. Self-regulatory depletion theory suggests that the ability to exercise self-control to override pre-existing patterns of responses is a limited resource, and thus can be temporarily depleted after use (Baumeister, 2002; Legault et al., 2009). If participants were actively attempting to override their behavioural stigma due to social desirability concerns, it is possible that participants’ ability to do so might be strongest at the beginning of the interaction and weaken over time. Specifically, it is possible that social desirability concerns and participants’ resultant suppression of behavioural stigma would be strongest at the beginning of the interaction and weaken over time. I chose to code a randomly
selected 1-minute clip from the unstructured segment of the interaction for each of the participants. Although this method should balance the number of thin-slices taken from various points of the unstructured segment across conditions, an alternative would be to instead code the 1-minute clip at the end of the interaction, where participants’ expressions of behavioural stigma might potentially be greatest.

It is also worth noting that the confederate’s impression rating and the thin-slice coding were proxies for behavioural stigma; in other words, they were not objective measures of discriminatory behaviour. Instead, behavioural stigma was inferred by how the observer (i.e., coder) or the interactor (i.e., confederate) perceived the participant to be toward the confederate during the interaction. Arguably, this method of assessment may have some ecological utility in that it likely captured the real-life process of how individuals with mental illness perceive the reactions of those that hear about their mental illness diagnosis for the first time.

Also, the assessment of participants’ characteristics, such as warm and friendly, were via observed bodily expressions, but also influenced by facial expressions that inevitably reflect the affective process of the interaction between the participant and the confederate. Although facial expressions are not uniquely behavioural, they provide essential information about behaviours, motives, and intentions, and thus were considered to be relevant in the assessment of behavioural stigma (Horstmann, 2003).

There were notable correlations between the confederates’ and naïve coders’ ratings of the participant and the participant’s self-reported stigma toward the confederate. Specifically, the confederates’ perceived positivity and negativity of the participants toward them during the interaction were correlated with participants’ reports of feeling more anger and fear toward the confederate. Moreover, positivity rated by the coder was negatively correlated with participants’
anger toward the confederate and positively correlated with their behavioural intentions to participate in a follow-up study with the confederate. This pattern of bivariate correlations suggests that there is a meaningful overlap in the measures from the interaction task. It indicates that participants’ self-reported stigma and the confederates’ and coders’ impression of the participants captured similar interpersonal processes occurring during the interaction task. The finding that the confederate’s impression ratings were not correlated with explicit stigma toward the hypothetical individual with bipolar disorder or with implicit stigma further strengthens this notion. Although participants may have certain beliefs, emotional reactions, and behavioural intentions toward a hypothetical person with bipolar disorder, these attitudes may not necessarily correspond to how others perceive them when interacting in real life with someone who ostensibly has bipolar disorder.

Despite the findings that affective stigma and perceived behavioural stigma toward the confederate were not affected by the intervention conditions, that LKM and EC impacted participants’ willingness to participate in a follow-up study with the confederate is promising. This study used a short 15-minute video as a stigma reduction strategy, and the participants only had 5 minutes to interact with the confederate. If the proposed follow-up study had been another real-life opportunity for participants to interact with a person with bipolar disorder, that interaction might initiate more meaningful and substantial attitudinal changes in the longer term.

**Mechanisms of Interventions**

Another aim of this study was to examine the mechanisms through which the interventions might reduce stigma toward bipolar disorder. Knowledge about bipolar disorder and positivity toward others were chosen as mediators of interest for EC and LKM, respectively.
Mediation analyses provided crucial insight into the important mechanisms of change in stigma reduction. Participants in the EC condition were, on average, more knowledgeable about bipolar disorder. Through the increase in knowledge, aspects of their affective, cognitive, and behavioural stigma toward a hypothetical person with bipolar disorder were also positively impacted. Specifically, participants in the EC condition were less likely to express anger and fear, endorse beliefs related to dependence and dangerousness, and more inclined to socially interact with a hypothetical person with bipolar disorder as a result of being more knowledgeable about bipolar disorder. Of note, except for anger, there were no significant direct effects of condition for these stigma outcomes. Thus, the finding implies that affective, cognitive, and behavioural stigma toward the hypothetical person was reduced for EC participants when participants demonstrated more knowledge about bipolar disorder. These findings support the idea that knowledge about mental illness is a crucial ingredient of stigma interventions.

As expected, participants’ positivity toward others, as a result of LKM, was associated with more pity, beliefs of intelligence, and positive behavioural intentions toward the hypothetical individual with bipolar disorder and willingness to interact with the confederate. An unexpected finding was that there was also a significant indirect effect of EC on several stigma measures via positivity toward others. As with LKM, positivity toward others mediated the impact of EC on more pity, beliefs of intelligence, and positive behavioural intentions toward the hypothetical person and toward the confederate—all positively valanced attitudes. The observation that positivity toward others was a significant mediator for both LKM and EC interventions suggests that this may be a non-intervention specific factor that is vital in improving attitudes toward a stigmatized individual. Interestingly, only positivity toward others, and not knowledge about bipolar disorder, was suggested to mediate the effect of intervention
conditions (both EC and LKM) on participants’ greater willingness to engage in a follow-up study with the confederate. Thus, positivity toward others may be uniquely valuable for impacting behavioural intentions toward a real-life person.

Another post-hoc finding was that there was a significant indirect effect of EC on lower levels of negatively valanced emotions and beliefs (specifically, anger, fear, and beliefs of dependence and dangerousness toward the hypothetical person), via lower negativity toward others relative to other conditions. Although negativity toward others was not hypothesized as a mediator for EC, this process may be similar to the mediating role of intergroup anxiety of the effect of intergroup contact on reducing prejudice of outgroups (Pettigrew & Tropp, 2006). The general pattern appeared to be that a decrease in negative beliefs or emotions toward a hypothetical person with bipolar disorder follows, presumably, a reduction in negativity, rather than an increase in positivity or in knowledge. Future studies should use a pre- and post-intervention design to ascertain the magnitude of change in the mediators as a result of the interventions.

EC versus LKM

One aim of this study was to test LKM as a novel intervention for reducing stigma of bipolar disorder. LKM was chosen for its explicit goal in increasing compassion and kindness toward self, others, and the world, and due to burgeoning empirical evidence suggesting its efficacy for reducing prejudice. The EC video was designed based on existing studies on stigma reduction.

Although both interventions were seemingly different in content, they were both efficacious through participants’ having more positivity toward others in general as a result of the intervention video. Presumably, LKM fostered positivity toward others through the guided
practice of directing loving-kindness toward others and the world, whereas, in the EC condition, learning about another person’s experience with bipolar disorder instilled positivity toward others. The finding that higher endorsement of the belief that individuals with bipolar disorder are intelligent in EC was not mediated by knowledge of bipolar disorder suggests that beliefs can be influenced via affective processes and not necessarily through more knowledge. Overall, positivity toward others, in general, appears to be instrumental in increasing endorsement of positive attributes and feelings toward a stigmatized group.

Meaningful differences between the conditions were identified. An expected difference was that the EC condition would be instrumental in the participants having more knowledge about bipolar disorder. This finding provides empirical support for the cognitive process through which stigma may be reduced. Although many studies have assumed knowledge to be crucial for education-based interventions, it has seldom been measured and tested as a mediator (Na et al., in preparation). Another surprising difference was the identification of positivity and negativity toward others as mediators for EC. The EC video created for this study appears to have been effective in tapping into both affective and cognitive routes of stigma reduction by harnessing the advantages of both educational and contact approaches.

A limitation of this study was that intergroup anxiety was not measured as a mediator for the EC condition. However, as previously mentioned, negativity toward others might have captured a similar affective process through which EC reduced stigma. Unlike LKM, the EC video did not instruct the participant to direct positivity toward anyone; neither did it explicitly bring attention to participants’ negativity toward others. One reason for the lower negativity toward others in the EC condition might be due to the unique factors of the presenter in the video. Dr. Barnes, a faculty member in psychology at the university attended by the participants,
presented all three conditions. However, in the EC condition, Dr. Barnes disclosed his personal experience with bipolar disorder and related how the disorder affected him. Because participants likely felt more affinity with Dr. Barnes due to the shared university and department affiliation, this may have fostered their sense of emotional connection to Dr. Barnes and, more broadly, their positivity and negativity toward others. Thus, positive and negative emotions toward others as a result of EC may have been uniquely impacted due to Dr. Barnes being the presenter, and thus should be investigated in future studies by perhaps manipulating the degree of association that participants have with the presenter.

Despite the best efforts to create intervention videos that were equivalent in strength, the EC video may have been a more robust and efficient intervention given the confines of the study. Dr. Barnes is a seasoned presenter who has talked about his experience with bipolar disorder in many settings. He is also a known person in the university, and about 22% of the participants already knew he was a faculty member. From the perspective of the participants who recognized him, hearing one of their instructors at the same university (and in many cases, department) relate his lived experience with bipolar disorder may have been much more useful in breaking down stigma than would have occurred with any other speaker. Even for participants who were unaware of his affiliation to their university, the fact that he is a faculty at a leading university might have been especially pertinent as an undergraduate student. Therefore, I speculate that the EC condition was maximally powerful despite it being a 15-minute video.

In contrast to his expertise in lecturing and talking about bipolar disorder, Dr. Barnes is not a trained mindfulness teacher. Nor does Dr. Barnes have any credibility with participants as a mindfulness expert. Although he used a standard LKM script, the effect of LKM may have been stronger had it been delivered by a seasoned mindfulness practitioner, who ideally was known
and respected by participants for having strong knowledge of mindfulness. Despite these factors, controlling for presenter effects was paramount and thus, having Dr. Barnes deliver the content across all the conditions was necessary.

Another key difference between the two videos was the extent to which they involved an in-depth didactic component. The EC condition contained a heavily information-based video, which may be more comfortable and familiar to participants (who are university students). In contrast, the LKM condition was an experiential task in which participants were guided to engage in mindfulness practice. However, the participants in LKM may have benefitted from more education and information about the fundamentals of meditative practice. A meta-analysis of the effect on LKM on positive emotions found that a didactic component, in addition to LKM practice, was associated with positive outcomes (Zeng et al., 2015); such a didactic component was not included in the LKM video used in this study. Also, while there is evidence suggesting that experienced LKM meditators are no different from novices in terms of positive outcomes, the length of practice is important for reaping the benefits of the practice (Lee et al., 2012; Leiberg et al., 2011). Thus, the finding that LKM improved certain aspects of stigma after a short, single session video is promising and warrants further study—perhaps with more practice sessions and a didactic component. To target negative emotions and beliefs and implicit bias (the components that the LKM condition was not efficacious in reducing), including a mindfulness training aimed at observing thoughts and feelings as transient mental events and developing a nonjudgmental stance toward self and others may be incrementally effective (Lueke & Gibson, 2016; 2015).
Strengths, Limitations, and Future Directions

As outlined in the Introduction, this study sought to address five key limitations identified in the current literature concerning mental illness stigma. One strength of this study included the effort in addressing and measuring multiple components of stigma, specifically cognitive, affective, behavioural, and implicit stigma. The study also attempted to address the limitations in the ecological validity of vignette measures by designing an interaction task to assess real-life stigma. One purpose in using the confederate’s impression rating as a proxy of behavioural stigma was to capture the subtle nuances in behaviours that someone with bipolar disorder might experience when they disclose their diagnosis. Another strength was empirically testing the mechanisms of these interventions and identifying the critical processes through which EC and LKM reduced stigma of bipolar disorder. Future studies should continue to identify and test mechanisms to further our understanding of how stigma reduction unfolds, and how it can be improved.

This study, however, is not without limitations. First, some of the study methodologies were necessary for practical reasons but limited the ability of the study to explore some important questions. For example, the power analyses suggested adequate power for main effects of the three conditions on stigma, but did not test power for the mediation analyses or the exploratory analyses. Thus, my analyses did not adequately answer the question of the order of change in stigma components, which may be mainly due to the lack of power in running such a model with the current sample size. Another methodological change to consider would be to measure stigma at baseline and after the intervention to enhance our understanding of the magnitude of change in stigma due to the intervention strategies.
Second, there were limitations in some of the measures used in the study; specifically, the thin-slice method for coding participants’ behaviours toward the confederate and the self-report measure of affective stigma toward the confederate. Future studies might consider using a more validated assessment tool for assessing emotional expression, such as the Facial Action Coding System (Ekman & Friesen, 1978). Other measures of behaviours, such as measuring the physical distance to the confederate (Norman et al., 2009), may also be an alternative to the coding of nonverbal behaviours during an interaction task.

Third, as with any explicit measures of stigma, social desirability may have influenced participants’ responses. Future studies may consider assessing participants’ internal (i.e., personal) and external (i.e., normative) motivation to respond without prejudice (Plant & Devine, 1998). A study examining the association between gender and stigma toward mental illness found that female students’ lower authoritarian and social restrictiveness opinions regarding mental illness were partially mediated by their internal motivation to respond without prejudice (Hampton & Sharp, 2020). Distinguishing between internal versus external motivations for responding without prejudice would also inform the development of stigma reduction interventions. For those with higher internal motivation, it may be relevant to highlight their values and how the values relate to prejudice and discriminatory behaviours toward mental illness. For those with higher external motivation, a group-based stigma intervention with contact opportunities may be crucial in taking advantage of their tendency to look to others for signals about what behaviours are appropriate.

Fourth, the knowledge of bipolar disorder questionnaire was a robust manipulation check for the EC condition. However, understanding the effect of LKM would have been enhanced with a more rigorous manipulation check for the LKM condition in addition to the SOFI.
example, to ensure that participants engaged in the instructions of directing loving-kindness
toward various targets, they could have been asked to recall the targets they directed loving-
kindness to at the end of the LKM exercise.

Fifth, although a minority, 22% of participants knew Dr. Barnes (the presenter of the
videos) prior to participating in the study, and among these participants, 56% were aware of his
bipolar diagnosis. However, their familiarity with Dr. Barnes and awareness of his bipolar
disorder diagnosis did not differ across conditions. A future study might introduce a presenter
who is not known to or shares an affiliation with the participants.

Similarly, it would be important to examine potential moderators when evaluating the
effect of stigma interventions. Participants’ familiarity with and history of mental illness
(including bipolar disorder) may be relevant moderators for stigma interventions in general, and
mindfulness practice experience could be a specific moderator for future stigma studies using
LKM. In the current sample, these characteristics did not differ across conditions and therefore
an a priori decision was made to not examine them as covariates. Moreover, as the focus of the
study was not on moderators, there were some limitations in the current sample to examine this
further, such as unbalanced sample sizes in the subgroups.

Notably, although the current interventions showed some efficacy in reducing stigma of
bipolar disorder, all of the significant results were small in magnitude. Benefitting from the
knowledge gained from this study, future studies might consider different methods of enhancing
the EC and LKM interventions. One idea is to design longer interventions with booster sessions
to bolster and sustain the effects. A module-based approach, where affective stigma is targeted
via contact, LKM, and mindfulness strategies, and cognitive stigma is targeted with EC and
mindfulness strategies, might improve the strength of the interventions. Behavioural stigma may
be targeted via intentional feedback and activities in which participants can apply the skills and knowledge gained from these modules. A study by Pennington et al. (2016) tested the effect of feedback on participants’ attitudes toward mental illness. They found that when participants received feedback about their implicit bias after completing an implicit measure of stigma, this enhanced the effect of imagined contact on their positive attitudes toward mental illness over 24 hours. This finding underscores the benefit of receiving feedback about one’s implicit biases, which has been uncommon in stigma reduction interventions thus far. Feedback about implicit bias in Pennington et al. (2016), rather than about explicit bias, might have been more effective at increasing participants’ motivation to change their explicit attitudes because participants were nondefensive about receiving this feedback. Implicit bias, by definition, can be explained as bias that exists outside of someone’s awareness and control, which might relieve the recipient of the feedback from feeling overly responsible.

**Clinical Implications**

Findings from this study have important clinical implications for individuals with mental illness and mental health care providers. Broadly, reducing the public stigma toward mental illness is likely to reduce the burden of stigma on those with mental illness. The stage model posits that perceived stigma (i.e., awareness of public stigma about their condition) precedes self-stigma (i.e., agreement and application of stigma to oneself; Corrigan & Rao, 2012). Longitudinal data support this causal pathway. Fox, Smith and Vogt (2018) found that higher anticipated stigma from friends and family led to higher levels of internalized stigma, which was associated with lower treatment seeking. Another study found that higher initial public stigma predicted higher subsequent self-stigma (but not the reverse) 3 months later (Vogel et al., 2013).
As perceived stigma is a precipitant to internalized stigma, witnessing the shifts in societal attitudes toward mental illness and public efforts to mitigate stigma may reduce the hopelessness that often accompanies internalized stigma. Moreover, there is ample evidence to suggest that even when individuals overcome the barriers of seeking treatment, stigma continues to impact their adherence to treatment. Thus, if, as expected, reductions in public stigma lead to reductions in perceived stigma and, therefore self-stigma, this may have a positive ripple effect on increasing treatment-seeking behaviours and treatment adherence. This pathway has yet to be tested empirically.

Given the causal link between public and internalized stigma, the findings of this study may inform how the link between public stigma and internalized stigma might be interrupted on the individual level. In fact, an EC video similar to the one used in this study might be a good starting point for those with bipolar disorder, as they might benefit from receiving educational content from and hearing about the personal experience of someone with lived experience with bipolar disorder, rather than from a mental health professional. In a study by Conner et al. (2015), a peer educator intervention (i.e., education provided by individuals with personal experience with mental illness over 3 months) was efficacious in reducing internalized stigma and improving knowledge about depression and treatment options in older adults with depression. All participants reported that the information shared by the peer educator was deemed as more credible and preferred than information shared by a health care professional (Conner et al., 2015). Thus, it appears that improving knowledge, and also a careful choice of the presenter of the information, are important factors for reducing not only public stigma but also internalized stigma. Future studies might explore whether a brief EC video from a peer with
personal experience with mental illness would be as efficacious in reducing internalized stigma as has been found for the longer, 3-month peer educator intervention.

An important consideration for clinicians is their own biases and stigma toward clients with mental illness. Despite their frequent contact with patients with mental illness, healthcare workers display stigmatizing attitudes toward those with mental illness (Henderson et al., 2014). Ongoing psychoeducation, especially regarding specific disorders they are treating and stigma-related knowledge, may be necessary for clinicians. Although they may have more knowledge than an average person, they might lack knowledge regarding specific disorders and the effects of stigma; thus providing regular and targeted clinical education for clinicians for the population with whom they are working may be crucial (Treloar & Lewis, 2008). This study provided support for the idea that specific knowledge about bipolar disorder may be essential in reducing stigma toward bipolar disorder. In addition, practices designed to increase overall positivity and decrease negativity toward others, such as contact-based education, mindfulness and compassion training, may also be helpful in addressing clinicians’ stigma (Hayes et al., 2004).

Importantly, given that public and internalized stigma are influenced and perpetuated by systemic prejudice and discrimination against individuals living with mental illness, intervening at the level of structural stigma (e.g., changes in policy making and media coverage) is likely crucial for sustained change in societal attitudes toward mental illness.
Conclusion

This study aimed to test the efficacies of EC (an approach combining education and contact) and LKM (a mindfulness-based practice), relative to a control condition, on reducing stigma toward bipolar disorder. Findings revealed many valuable insights for understanding the process of stigma reduction.

This study was the first to test the efficacy of LKM on reducing stigma toward mental illness. Although LKM did not reduce affective and implicit stigma as expected, it was associated with more positive behavioural intentions toward the real-life confederate with bipolar disorder. Mediational analyses indicated that higher positivity toward others due to LKM led to changes in terms of more positive behavioural intentions toward both the real-life confederate and the hypothetical person, and higher beliefs of intelligence and more pity toward the hypothetical person with bipolar disorder. Given that the study tested a brief 15-minute LKM intervention, these initial results indicate promise for LKM as a stigma reduction strategy. An extended LKM intervention with multiple sessions and a didactic component might be associated with more significant improvements in stigma outcomes.

This study also employed an efficient and brief EC intervention that led to improvements in some aspects of stigma toward the hypothetical person with bipolar disorder and in behavioural intentions toward the confederate. Significantly, knowledge of bipolar disorder was positively impacted by EC, which then led to improvements in affective, cognitive, and behavioural stigma toward the hypothetical person with bipolar disorder. Post-hoc analyses revealed that EC also reduced some aspects of stigma via lower negativity toward others and higher positivity toward others. Higher positivity toward others also mediated the association between EC and participants’ more positive behavioral intentions toward the confederate.
This study highlighted the importance of multi-faceted assessment of stigma components and identified the process through which stigma can be reduced. In particular, continued efforts to use ecologically valid measures of stigma (e.g., real-life behaviours) and to adapt existing measures to changing perceptions and attitudes of mental illness would greatly enrich the field of stigma research. Moreover, efforts should also be directed toward testing mechanisms of stigma reduction and bolstering existing intervention strategies to explicitly include components that increase knowledge about mental illness, while targeting increasing positivity and reducing negativity toward others.
References


Kiropoulos, L. A., Griffiths, K. M., & Blashki, G. (2011). Effects of a multilingual information website intervention on the levels of depression literacy and depression-related stigma in Greek-born and Italian-born immigrants living in Australia: a randomized controlled trial. *Journal of Medical Internet Research, 13*(2), e34. [https://doi.org/10.2196/jmir.1527](https://doi.org/10.2196/jmir.1527)


Appendices

Appendix A: Pre-Video Measures

**Cheek and Buss Shyness Scale - Revised**
(Cheek & Briggs, 1990)

Read each item carefully and decide to what extent it is characteristic of your feelings and behaviour using the following scale. (1 = very uncharacteristic or untrue, strongly disagree, 2 = uncharacteristic, 3 = neutral, 4 = characteristic, 5 = very characteristic or true, strongly agree)

1. I feel tense when I’m with people I don’t know well
2. I am socially somewhat awkward
3. I do not find it difficult to ask other people for information (R)
4. I am often uncomfortable at parties and other social functions
5. When in a group of people, I have trouble thinking of the right things to talk about
6. It does not take me long to overcome my shyness in new situations (R)
7. It is hard for me to act natural when I am meeting new people
8. I feel nervous when speaking to someone in authority
9. I have no doubts about my social competence (R)
10. I have trouble looking someone right in the eye
11. I feel inhibited in social situations
12. I do not find it hard to talk to strangers (R)
13. I am more shy with members of the sex I am attracted to
14. During conversations with new acquaintances, I worry about saying something foolish

**Cheek and Buss Sociability Scale**
(Cheek & Buss, 1981)

1. I like to be with people
2. I welcome the opportunity to mix socially with people
3. I prefer working with others rather than alone
4. I find people more stimulating than anything else
5. I’d be unhappy if I were prevented from making many social contacts
Appendix B: Intervention-related Documents

*Education-Contact Video Script*

**Education component**
Bipolar disorder is a condition in which a person cycles through depressed mood, elevated mood (also known as manic episode), and a period in which people feel “normal” and are doing well. These states are often more extreme and different from “mood swings”, emotional ups and downs that everyone experiences.

A person who is in a **manic phase** may seem continuously euphoric and happy, or irritable, angry, and aggressive, for at least one week.

For a diagnosis of a manic episode, the elevated mood must also accompany three of the following symptoms:
- exaggerated self-esteem or feeling of grandeur
- decreased need for sleep
- more talkative than usual
- racing thoughts & flights of ideas
- easily distracted
- excessive energy for activities
- engaging in risky behaviour or exhibiting poor judgement
- psychotic symptoms

A person might also experience these symptoms less severely or intensely. This is known as **hypomania**. The person’s life is usually not as seriously disrupted as it would have been with a full-blown manic episode. Hypomania may progress to a full-blown manic episode or a severe depressive mood.

**Depressed mood** is substantially different from normal sadness and can take many forms. For a diagnosis of a major depressive episode, the symptoms must last for at least two weeks, and must be present most days and last most of the day.

A depressive phase of bipolar disorder is characterized by a person experiencing at least five of the symptoms of depression for at least two weeks on most days:
- depressed mood
- loss of interest or pleasure in activities that used to be enjoyable
- weight loss or gain
- difficulty sleeping or sleeping too much
- apathy or agitation
- loss of energy
- feelings of worthlessness and guilt
- inability to concentrate
- thoughts of suicide
Some people with bipolar disorder experience manic and depressive symptoms at the same time. This is called a **mixed episode**. For example, someone experiencing a mixed episode may think and speak very rapidly. At the same time, they may be very anxious and have suicidal thoughts. Mixed episodes are hard to diagnose and are very painful for the individual. Over a lifetime, the average person with bipolar disorder experiences about 10 episodes of depression and mania/hypomania or mixed states. Rapid cycling refers to those who have multiple (4+) mood episodes (major depressive, manic, hypomanic) within 1 year.

Some people with bipolar disorder may also have motor problems (catatonic symptoms), which include extreme physical agitation, slowness, or odd movements or postures. This affects up to approximately 25 per cent of individuals with bipolar disorder. Oftentimes, people become free of catatonic symptoms after receiving specific treatment. Catatonic symptoms may be misdiagnosed for schizophrenia.

Bipolar disorder is categorized according to the level of manic symptoms. An individual with bipolar I experiences mania, while those with bipolar II experience hypomania. Major depressive episode is common for those with bipolar I diagnosis, but is not required. However, recurring 1 or more major depressive episode is required for a diagnosis of a bipolar II diagnosis.

**Causes & Risk Factors**
Although the precise causes of bipolar disorders are unknown, there is strong evidence that biological factors, such as genetics, play an important role. This does not mean that a person has to inherit the genes. The genes involved may be altered when a person is conceived.

Stress, positive and negative life events may trigger an episode, but they do not cause the illness. In other words, these factors may trigger an episode in someone who already has the illness. Research has shown that individuals with bipolar disorder tend to experience increased stressful events prior to the first onset and recurrences of mood episodes. Some hypothesize that life events that disrupt daily social rhythms (meal times, sleep-wake times) trigger mood episodes through their destabilizing effects on circadian rhythms.

Some triggers are chemical, which includes medications (such as some antidepressants, steroids) and street drugs (such as cocaine and amphetamines).

Also, bipolar disorder is not simply due to an imbalance of neurotransmitters, although neurotransmitters may be affected during a flare-up of the illness.

**Prevalence**
Lifetime prevalence of bipolar I is 0.6% and of bipolar II is 0.4%.
Gender ratio for bipolar I disorder is equal. Findings for bipolar II disorder are mixed: some, but not all, clinical samples suggest that bipolar II disorder is more common in females than in males, which may reflect gender differences in treatment seeking or other factors.

**Course**
An average age of onset for Bipolar I is around 18 years old. More than 90% who have a single manic episode go on to have recurrent mood episodes. Approximately 60% of manic episodes occur immediately before a major depressive episode.

An average onset for Bipolar II is mid-20s. It often begins with a depressive episode and is not recognized as bipolar II until a hypomanic episode is experienced. This happens in about 12% of individuals with an initial diagnosis of major depressive disorder. The interval between mood episodes tend to decrease as the individual ages.

Untreated mania can often last for two to three months; untreated depressions can last longer, between four and six months. Therefore, it is important that a person seeks treatment right away.

**Treatment**

Treatment of bipolar disorder typically includes biological treatment (such as medication) and psychosocial treatment (such as psychoeducation, psychotherapy). Both treatments are needed, however, the first line of treatment is medication to bring the symptoms under control.

Medications are considered to be the cornerstone of treatment in bipolar disorder. Mood stabilizers, antidepressants, and anti-psychotics are the main treatments. These medications are not addictive. They are crucial for restoring and promoting wellness, and for prevention of return of symptoms. As there are several types of medication prescribed for bipolar disorder, finding the right medication and the right dose with the doctor’s careful monitoring is important. Long-term medication treatment is important as medication helps with prevention of future episodes. There is an 80 percent risk of relapse within two years if a person ends the treatment. Relapse is more likely if medication is discontinued too soon. Recommendations for how long medication should be taken depends on the type of the illness.

Other types of biological treatments include light therapy, electroconvulsive therapy, and transcranial magnetic stimulation.

**Psychosocial treatments**

Psychosocial treatments include psychoeducation, psychotherapy and support groups.

**Psychoeducation** provides an education about bipolar disorder and also an opportunity to talk about their feelings and experiences related to living and coping with the disorder. This process helps people deal with the difficulties of coping with the disorder and better adhere to a treatment plan that is a good fit for them. Typically, each session focuses on a different aspect of managing bipolar disorder, such as signs and symptoms, stress management and problem solving. Psychoeducation also helps family members and partners understand bipolar disorder and what they can do to be helpful. Importantly, it also helps people with bipolar disorder and their families to deal with their concerns about the stigma of mental illness.

**Psychotherapy** describes a form of treatment that is based on talking work done with a therapist. The goal is to relieve stress by discussing and expressing feelings, to help change attitudes, behaviour and habits that may be unhelpful, and to promote more constructive and adaptive ways
of coping. Importantly, for bipolar disorder, psychotherapy only works as an add-on to medication. Cognitive behavioral therapy has been shown promise for treating unhelpful thoughts associated with bipolar disorder. Psychotherapy may also aim to decrease interpersonal stress and destabilization of daily rhythms or improve family communication skills and social support.

A peer support group is a group of people who all have bipolar disorder. People who have been diagnosed with bipolar disorder can benefit from the experience of others and provide support to one another in a safe and accepting environment.

Process of recovery
Good medication management, social support, healthy daily routine (e.g., healthy diet and regular exercise, bedtime routine), coping strategies are helpful in preventing relapse and maintaining a healthy lifestyle. Once the symptoms are stabilized on medication, most people with bipolar disorder can return to their previous responsibilities and activities.

A few facts about bipolar disorder
Having a bipolar disorder diagnosis has been associated with having a creative profession.

Stereotype that individuals with bipolar disorder are violent has no factual basis. Individuals with mental illness are more likely to be victims of violence than the perpetrators. Moreover, they are likely to do more harm to themselves (e.g., by self-sabotaging) than to others.

Contact Component - Steven’s story
Now I want to tell you about my own experience with bipolar I disorder.

Although I initially did quite well at university, during the second year of my undergraduate degree things began to change. I felt tired all the time, slept excessively, and had trouble reading. I was delusional: I thought all my peers and instructors disliked me and saw me as stupid. Most disturbingly, I was also often thinking about ways of killing myself. I felt hopeless and alone. My world had become washed out and frightening.

I found a psychiatrist, and she diagnosed me with major depressive disorder. But I refused her offer of antidepressant medications; I was worried about side effects. I did attend psychotherapy sessions. Although it helped to talk about my problems, things didn’t seem to improve much.

I managed to complete my degree and applied to graduate school. A few months into my grad studies my depression deepened. I was now constantly dwelling on how stupid and alone I was, and my mind raced with visions of hanging myself, overdosing, or slitting my wrists. My psychiatrist noticed the dramatic change and hospitalized me for 2 weeks.

While hospitalized, I was started on an antidepressant to ease my depression and an antipsychotic to help with my delusions. After being discharged from hospital, I decided to take a break from my studies. I returned to grad school several months later—but my symptoms
persisted despite the meds I was taking. I basically struggled through the remainder of my master’s in biopsychology and then I began a PhD in biopsychology.

Shortly into my PhD my grey veil of depression lifted. Things seemed more vibrant. Everyone was now my friend. I slept very little—often as little as 3 hours a night. I could read faster, and I became extremely productive. I felt light on my feet and agile in my thinking.

Things continued to get better and better for me over the next few months. I was sleeping 2 hours or less a night. Some night’s I would just skip sleeping altogether. I found I could read multiple books at once without losing my train of thought. Books and articles began to pile up around me. I started to see linkages between the many things I was reading and I developed a complex theory of how every aspect of society functioned and was interconnected. My apartment walls were transformed into a complex web of interconnected ideas and images. I saw patterns in everything.

But nobody else seemed to understand my theories. They would give me curious looks when I described them. Negativity began to creep into my consciousness and the theories I had developed now seemed dark and ominous. They towered over everything. Monsters emerged from every corner. And thoughts of suicide began to dominate my mind.

Feeling tormented by my own theories and thoughts of suicide, I contacted my psychiatrist. I thought she might understand my theories. I called her and she asked me to meet her for a chat. She must have sensed my state of mind because when we met I was immediately diagnosed with bipolar disorder type I and told I was in a mixed state. I was then committed to a psychiatric ward for 6 weeks.

Heavily sedated on meds, I slept for much of my first week on the ward. When I came out of my stupor, the ward’s resident psychiatrist told me I would be placed on a particular mood stabilizer and that I would likely have to take it for the rest of my life. I felt quite uncomfortable about this because many other patients on the ward were taking that medication and they seemed like zombies to me – it’s side effects looked unpleasant to me. So, I asked for access to the hospital library so I could learn more about my condition and the medications used to treat it. I was amazed by what I found. A new medication that had recently cleared clinical trials was proving to be effective with fewer side effects than the one favoured by the resident psychiatrist. When I presented the resident psychiatrist with this evidence, he agreed to prescribe the new drug.

Today, I am feeling well and have finished graduate school. In fact, at the time of my creating this animation, I currently hold a faculty position at a leading university.

I never imagined that the lessons learned from Biopsychology would have such a positive impact on my life. Although I still experience mood episodes associated with my bipolar disorder, they aren’t nearly as severe as they were before I started taking a mood stabilizer, and I have learned to manage the residual symptoms using both pharmacological and psychosocial methods. I am glad I could tell you my story and hope that you or someone you care for will benefit from it.
Loving-kindness Meditation Instructions

Introduction

Loving-kindness is unconditional, inclusive love, a love with wisdom. It has no conditions; it does not depend on whether one “deserves” it or not; it is not restricted to friends and family; it extends out from personal categories to include all living beings. There are no expectations of anything in return. This is the ideal, pure love, which everyone has in potential. We begin with loving ourselves, for unless we have a measure of this unconditional love and acceptance for ourselves, it is difficult to extend it to others. Then we include others who are special to us, and, ultimately, all living things. Gradually, both the visualization and the meditation phrases blend into the actual experience, the feeling of loving-kindness.

This is a meditation of care, concern, tenderness, loving-kindness, friendship: a feeling of warmth for oneself and others. The practice is the softening of the mind and heart, an opening to deeper and deeper levels of the feeling of kindness, of pure love. Loving-kindness is without any desire to possess another. It is not a sentimental feeling of goodwill, not an obligation, but comes from a selfless place. It does not depend on relationships, on how the other person feels about us. The process is first one of softening, breaking down barriers that we feel inwardly toward ourselves, and then those that we feel toward others.

Take a very comfortable posture. One of the aims in this meditation is to feel good, so make your posture relaxed and comfortable.

Body Position
Close your eyes. Sit comfortably with your feet flat on the floor and your spine straight. Relax your whole body. Keep your eyes closed throughout the whole visualization and bring your awareness inward. Without straining or concentrating, just relax and gently follow the instructions.

Take a deep breath in. (pause 1, 2, 3) And breathe out. (pause 1, 2, 3) Begin to focus around the chest area, your “heart center”.
Breathe in and out from that area, as if you are breathing from the heart center and as if all experience is happening from there.
Anchor your mindfulness only on the sensations at your heart center.

Receiving Loving-Kindness
We begin with developing loving-kindness toward ourselves; allowing our hearts to open with tenderness. Now, allow yourself to remember and open up to your basic goodness. (Pause) You might remember times you have been kind or generous. (Pause) You might recall your natural desire to be happy and not to suffer. (Pause)

It may help to use the imagination and to picture yourself as a young child standing before you (Pause) perhaps 4 or 5 years of age... if that allows tender feelings of kindness to flow more easily. (Pause)
And, as you experience this love, notice how you feel in your body. (Pause) Maybe you feel some warmth or heat in the face. (Pause) A smile. (Pause) A sense of expansiveness. (Pause) This is loving-kindness, a natural feeling that is accessible to all of us always. (Pause) Rest with this feeling of open, unconditional love for a few moments (longer pause).

Letting yourself bask in the energy of loving-kindness; breathing it in (Pause) and breathing it out (Pause)...inviting feelings of peace and acceptance (Pause).

So, beginning now to wish yourself well by extending words of loving kindness to yourself.

Repeat the following phrases, silently:
May I live with ease, may I be happy, may I be free from pain. (pause)
May I live with ease, may I be happy, may I be free from pain. (pause)
May I be safe, may I be healthy, may I live with ease and happiness. (pause)
May I be safe, may I be healthy, may I live with ease and happiness. (pause)

Sometimes acknowledging your own goodness can be difficult. Look at yourself through the eyes of someone who loves you. (pause, give time to think of someone) Or, you may recall the unconditional love you felt from a beloved pet. (pause)

Keeping your eyes closed, think of a person close to you who loves you very much. (pause) It could be someone from the past or the present; someone still in life or who has passed. (pause) Imagine that person standing on your right side, sending you their love. That person is sending you wishes for your safety, for your well-being and happiness. (pause) Feel the warm wishes and love coming from that person toward you. (longer pause)

Now bring to mind the same person or another person who cherishes you deeply. (pause, give time to think of someone) Imagine that person standing on your left side, sending you wishes for your wellness, for your health and happiness. Feel the kindness and warmth coming to you from that person. (longer pause)

Now imagine that you are surrounded on all sides by all the people who love you and have loved you. (pause) Picture all of your friends and loved ones surrounding you. They are standing sending you wishes for your happiness, well-being, and health. (pause) Bask in the warm wishes and love coming from all sides. You are filled, and overflowing with warmth and love. (pause)

**Sending Loving-Kindness to Loved Ones**
Now bring your awareness back to the person standing on your right side. (pause) Begin to send the love that you feel back to that person. (pause) You and this person are similar. Just like you, this person wishes to be happy. Send all your love and warm wishes to that person. (pause)

Repeat the following phrases, silently:
*May you live with ease, may you be happy, may you be free from pain.*
(pause)
*May you live with ease, may you be happy, may you be free from pain.*
(pause)
*May you live with ease, may you be happy, may you be free from pain.*
(pause)

Now focus your awareness on the person standing on your left side. (pause) Begin to direct the love within you to that person. (pause) Send all your love and warmth to that person. That person and you are alike. Just like you, that person wishes to have a good life. (pause)

Repeat the following phrases, silently:
*Just as I wish to, may you be safe, may you be healthy, may you live with ease and happiness.*
(pause)
*Just as I wish to, may you be safe, may you be healthy, may you live with ease and happiness.*
(pause)
*Just as I wish to, may you be safe, may you be healthy, may you live with ease and happiness.*
(pause)

Now picture another person that you love, perhaps a relative or a friend. (pause, allow time to think of a person) This person, like you, wishes to have a happy life. Send warm wishes to that person. (pause)

Repeat the following phrases, silently:
*May your life be filled with happiness, health, and well-being.*
(pause)
*May your life be filled with happiness, health, and well-being.*
(pause)
*May your life be filled with happiness, health, and well-being.*
(pause)

**Sending Loving-Kindness to Neutral People**
Now think of an acquaintance, someone you don’t know very well and toward whom you do not have any particular feeling. (pause, allow time to think of a person) You and this person are alike in your wish to have a good life. (pause)

Send all your wishes for well-being to that person, repeating the following phrases, silently:
*Just as I wish to, may you also live with ease and happiness.*
(pause)
*Just as I wish to, may you also live with ease and happiness.*
Just as I wish to, may you also live with ease and happiness.

Now bring to mind another acquaintance toward whom you feel neutral. (pause, allow time to think of a person)

It could be a neighbor, or a colleague, or someone else that you see around but do not know very well. Like you, this person wishes to experience joy and well-being in his or her life. (pause)

Send all your good wishes to that person, repeating the following phrases, silently:
May you be happy, may you be healthy, may you be free from all pain. (pause)
May you be happy, may you be healthy, may you be free from all pain. (pause)
May you be happy, may you be healthy, may you be free from all pain. (pause)

Sending Loving-Kindness to a Difficult Person

Now move to someone you have difficulty with—hostile feelings, resentments. (pause, allow time to think of a person) Perhaps it’s someone you don’t like to feel sympathy or compassion for. (pause) Seeing if it’s possible to let go of feelings of resentment and dislike for this person. Reminding yourself to see this person as a whole being...deserving of love and kindness. (pause)

If you begin to feel ill will toward this person, return to the loved ones and let the loving kindness arise again. Then return to this person.

Repeat the phrases for this person silently:
May you be happy, may you be healthy, may you be free from all pain. (pause)

If you have difficulty doing this, you can say before the phrases, “To the best of my ability I wish:....” (pause)
May you be happy, may you be healthy, may you be free from all pain. (pause)
May you be happy, may you be healthy, may you be free from all pain. (pause)

Sending Loving-Kindness to All Living Beings

Now expand your awareness and picture the whole globe in front of you as a little ball. (pause) Send warm wishes to all living beings on the globe, who, like you, want to be happy:
Just as I wish to, may you live with ease, happiness, and good health. (pause)
Just as I wish to, may you live with ease, happiness, and good health. (pause)
Just as I wish to, may you live with ease, happiness, and good health. (pause)

Take a deep breath in. (pause – 1,2,3,4,5). And breathe out. (pause – 1,2,3,4,5). And another deep breath in (pause) and let it go (pause).

Notice the state of your mind…and how you feel after this meditation. (pause)

When you’re ready, you may open your eyes slowly.
Ancient Beginnings
Early Chinese authors were among the first to understand bipolar disorder as a mental illness, and the current conceptualization of the illness can be traced back to France in the 1850s. There have been many disputes over who first conceptualized the condition, but the general consensus is that Jean-Pierre Falret and Jules Baillarger were amongst the first two. The first documented diagnosis of bipolar disorder was made by French psychiatrist Jean-Pierre Falret.

In the 20th century, Emil Kraepelin, a German psychiatrist, distinguished bipolar from other mental disorders and furthered research on potential causes of the illness. He further developed the concepts using Karl Kahlbaum’s classification systems for symptoms of bipolar disorder. He is often recognized as the founder of modern scientific psychiatry and psychopharmacology.

In 1980, the American Psychiatric Association’s Diagnostic Statistical Manual of Mental Disorders included bipolar disorder in its third revision. While the information available to us regarding bipolar disorder has changed and evolved in the medical literature over time, the criteria for bipolar disorder diagnosis has changed as well. These changes follow the successive versions of the DSM, as each edition of the DSM reflect continuing knowledge and incorporation of scientific data with regard to mental disorders. The purpose of the DSM is to provide clinicians and researchers with clearly defined diagnostic terms in order to effectively treat patients. Bipolar disorder diagnoses were originally influenced by the psychodynamic approach, and this was the model that was followed when bipolar was published in the first DSM in 1952.

In the following version of the DSM-III, the DSM-III-R, further improvement was made to the diagnosis of bipolar disorder by supplementing the diagnosis with subtyped classifications. In the DSM-IV, published in 1994, as well as in the DSM-IV-TR, it has evolved into a more nuanced subtype system rather than a monolithic disorder with a single set of criteria. There will certainly be more revisions and changes in future editions of the DSM, as research-informed knowledge about the nature of bipolar disorder continues to be uncovered.

Bipolar disorder is also included in the ICD, or the International Statistical Classification of Disease and Related Health Problems. This includes a detailed description of disease and disorders published by the World Health Organization and is used worldwide for classifying and reporting morbidity and mortality statistics. The ICD allows clinicians and scientist to communicate on an international level while using a single diagnostic classification scheme.

Grants and Funding for Bipolar Disorder
Collaborative Research Team to study psychosocial issues in Bipolar Disorder (CREST.BD) is a multidisciplinary collaborative network of researchers, healthcare providers, people living with bipolar disorder, their family members and supporters. CREST.BD recently received a major funding award from Canadian Institutes for Health Research. This funding will support the growth of the provincially-focused team into a Canada-wide network.
Dr. Sheri L. Johnson is a professor of Psychology at the University of California Berkeley, where she directs the Cal Mania (Calm) Program. She has conducted research on psychological facets of bipolar disorder over the past twenty years. Her work has been funded by the National Alliance for Research on Schizophrenia and Depression, the National Institute of Mental Health, the National Science Foundation, and the National Cancer Institute. She has published over 180 manuscripts, including publications in leading journals such as the Journal of Abnormal Psychology and the American Journal of Psychiatry. She is co-editor or co-author of five books, including Emotion and Psychopathology and a best-selling textbook on Abnormal Psychology (Wiley Press). She is currently a fellow for Association for Behavioral and Cognitive Therapies (ABCT). Her major research goals are to understand the triggers of mania and depression within bipolar disorder. She is a fellow in the Association for Behavioral Medicine Research and the American Psychological Society. Dr. Johnson and her graduate students use physiological, behavioural and experience sampling methods to understand mechanisms of bipolar disorder.

**Thomas D. Meyer, Ph.D.** is a clinician-researcher specializing in bipolar disorder. He works to improve the quality of life for individuals experiencing mood disorders and their loved ones through research, training and practice. Dr. Meyer is also interested in improving screening for bipolar disorders and identifying factors and processes involved in the development and maintenance of depression and mania. As an accomplished researcher, Dr. Meyer has collaborated with colleagues in the UK and Germany.

The recognition of his expertise in bipolar disorders is highlighted by the fact that he was nominated and selected to be a member of two national treatment guidelines for bipolar disorders: the German S3 guideline for bipolar disorders and the update of the bipolar treatment guideline by the National Institute of Clinical Excellence (NICE).

Dr. Meyer completed his training as a psychologist and psychotherapist in Germany in the Department of Psychiatry and Psychotherapy and the Outpatient Clinic of the Department of Psychology at Johannes Gutenberg University in Mainz, Germany. He continued with a Ph.D. at Johannes Gutenberg University, under the supervision of Professor Martin Hautzinger. He then joined the Faculty of the Department of Clinical and Developmental Psychology at the Eberhard Karls University, Tübingen, Germany, as an Assistant Professor. He was promoted to the level of an Associate Professor after having been awarded the highest academic title in Germany. In 2006 Dr. Meyer moved to Newcastle University to take on a Senior Lectureship position in Clinical Psychology at the Institute of Neuroscience. As Principal and Co-Investigator he has been and is still involved in several projects. He joined the Department of Psychiatry and Behavioral Sciences at McGovern Medical School in June 2014 as an Associate Professor, where he has been involved with mentoring younger colleagues including graduate students, interns and postdoctoral fellows.

The Stanley Medical Research Institute (SMRI) is the largest nongovernmental source of funding for research on schizophrenia and bipolar in the United States. SMRI is a non-profit organization that began in 1989 and has supported over $600 million in research in more than 30 countries worldwide. SMRI works closely with the Treatment Advocacy Center (TAC), which is a non-
The Brain and Behaviour Research Foundation has raised over 394 million dollars for research grants since 1987 with 31 million dollars going directly to bipolar research. The foundation places 100% of their donations into research as their expenses are covered through foundation grants. The foundation funds scientists that are approved by a scientific counsel that are all volunteers. One person who has published through the foundation is Dr. Trisha Suppes. Dr. Suppes is a professor at Stanford focusing on psychiatry and behavioural sciences with a clinical focus on psychiatric treatment of bipolar disorder and major depression. Dr. Trisha Suppes is the Director of the Bipolar and Depression Research Program at the VA Palo Alto Health Care System at Stanford University. She is a recognized expert on the treatment of bipolar disorder. Dr. Suppes has received the “Gerald L. Klerman Senior Investigator Award, Depressions and Bipolar Support Alliance (2008)” and was a part of the Board of Councilors, International Society for Bipolar Disorders. Currently, she is involved in several initiatives to improve evidence-based treatment for bipolar disorders as well as advancing research on long-term treatment strategies. Her current work also includes updating the APA DSM-5 criteria for Bipolar disorder. Her current studies involve the use of the internet as a tool to support individuals with bipolar disorder. With her husband, she has been the recipient of the People of Vision Award from the Bascom Palmer Eye Institute, the Hermes Humanitarian Award, the Community Service Award from the Palm Beach Chamber of Commerce, the 2009 Mogens Schou Award for Public Service from The International Society for Bipolar Disorders and the 2017 Sallie Province Mink Community Education Award from Johns Hopkins.

Waltraud E. (“Wally”) Prechter founded the Heinz C. Prechter Bipolar Research Program in November of 2001. In 2004, the Program was transferred to the University of Michigan Health System and is now the Heinz C. Prechter Bipolar Research Program at the University of Michigan Depression Center. The mission of the Heinz C. Prechter Bipolar Research Program is to discover the mechanisms that contribute to bipolar disorder, predict and improve outcomes, and develop effective, innovative treatments.

The Pfizer Canada Schizophrenia or Bipolar Disorder Research Award (Grant) is given out to researchers who meet the specific criteria. The grant can supply the researcher with up to $100,000. To receive this grant a researcher must be investigating cognitive function dealing
with bipolar or schizophrenia. Also this grant is to be used to be put toward the costs of the research project and not as a stipend or a salary.

The Harvard Brain Science Initiative (HBI) Bipolar Disorder Seed Grant Program supports research relevant to the basic understanding and eventual treatment of bipolar disorder. Supported by a generous gift from the Dauten Family Foundation, this program funds innovative, visionary projects with new ideas and approaches that otherwise may not attract seed funding from conventional sources. To date the program has awarded 30 grants totaling $3M, to laboratories with diverse areas of expertise, spread out across different campuses of Harvard University and its affiliated hospitals. The founding director Joyce Licht Sang has dedicated her life to helping millions. Over the past thirty years, Joyce has had leadership roles in many non-profit organizations or their activities, including: Bascom Palmer Eye Institute (University of Miami), Children's Home Society (Palm Beach), Florida House (Washington, DC), Planned Parenthood of Palm Beach & Treasure Coast, Red Cross - The Greater Palm Beach Area and HCUND of the United Nations (New York). She was named a Woman of Distinction by Palm Beach Atlantic University in 2012. She is a member of the Massachusetts General Hospital Leadership Council for Psychiatry and the Brain Health Advisory Council of the Palm Healthcare Foundation.

The Ryan Licht Sang Bipolar Foundation is dedicated to fostering awareness, understanding and research for Bipolar Disorder. The Foundation is on a Quest For The Test™ to find an empirical test for Bipolar Disorder. The Bipolar Awareness Ribbon is the symbol for The Ryan Licht Sang Bipolar Foundation. The Ribbon was designed for the Foundation by Ryan's mother.

The National Institute of Mental Health is one of the world’s foremost medical research centres. They support scientific studies in the United States to improve health and promote research advancement.

In 2009, a meeting was held in Washington, D.C. by NIMH and the Division of Developmental Translational Research in order to discuss the differences found between research groups in the approaches used to diagnose bipolar disorder in children and adolescents in particular. This meeting established that more data was needed to address consensus on primary assessment tools for clinical research studies as well as on operationalizing criteria and symptoms. Therefore, current bipolar research has had a larger focus on conducting further empirical studies of bipolar disorders, developing common measures for collaborative studies, and establishing a network to strengthen diagnostic consensus on operationalizing particular states and symptoms within bipolar patients.

A bibliometric study was done on the status of bipolar disorder research, where levels of research activity were compared between bipolar disorder and schizophrenia. The study found that bipolar research is underrepresented relative to schizophrenia. This may imply that there is a poorer evidence base in bipolar research, as well as practical difficulties inherent in bipolar disorder research. These implications call for more of an emphasis on bipolar research in general as well
as strategies to overcome any methodological difficulties found in collecting data on bipolar research.

There has been inadequate research regarding current epidemiologic knowledge about bipolar disorder in Canada. There have only been a total of three prevalence studies in the country, and none of them distinguished between types of bipolar disorder. A study on the Prevalence of Bipolar Disorder in Canada was released in 2015. Data were obtained from the 2012 Canadian Community Health Survey: Mental Health and Well-being. This survey was a nationally representative sample of households in Canada. The study’s findings aligned with those reported in prior literature, however misclassification concerns still exist.

Currently, researchers suggest an integrative approach to bipolar disorder. This model is inspired by both the current understanding of bipolar disorder as well as the sensitivities to the patients themselves.
Appendix C: Manipulation Check/Mediator Measures

Self-Other Four Immeasurables (SOFI)

Please rate the extent to which you feel the following emotions currently:

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<th>2</th>
<th>3</th>
<th>4</th>
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<td></td>
<td>A little</td>
<td>Moderately</td>
<td>Quite a bit</td>
<td>Extremely</td>
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<tr>
<td>1.</td>
<td>Friendly – toward myself</td>
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<td>2.</td>
<td>Friendly – toward others</td>
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<td>3.</td>
<td>Hateful – toward myself</td>
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<td>4.</td>
<td>Hateful – toward others</td>
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<td>5.</td>
<td>Angry – with myself</td>
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<td>6.</td>
<td>Angry – with others</td>
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<td>7.</td>
<td>Joyful – for myself</td>
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<td>8.</td>
<td>Joyful – for others</td>
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<td>9.</td>
<td>Accepting – toward myself</td>
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<td>10.</td>
<td>Accepting – toward others</td>
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<td>11.</td>
<td>Cruel – toward myself</td>
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<td>12.</td>
<td>Cruel – toward others</td>
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<td>13.</td>
<td>Compassionate – toward myself</td>
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<td>14.</td>
<td>Compassionate – toward others</td>
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<td>15.</td>
<td>Mean – toward myself</td>
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<td><strong>16.</strong></td>
<td>Mean – toward others</td>
<td></td>
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Knowledge of Bipolar Disorder

1. Which of the following is NOT a symptom of a manic episode?
   a. Decreased need for sleep
   b. Increased appetite
   c. Flights of ideas
   d. Anxiety
   e. Excessive energy
   f. Psychotic symptoms

2. Which of the following is NOT a symptom of a depressive episode?
   a. Apathy
   b. Inability to concentrate
   c. Feelings of worthlessness
   d. Thoughts of suicide
   e. Excessive crying
   f. Weight loss

3. Depressive symptoms must last for at least two weeks for a diagnosis of depressive episode.
   a. True
   b. False

4. Bipolar disorder is characterized according to the level of _______.
   a. Depressive symptoms
   b. Manic symptoms

5. Over a lifetime, an average person with bipolar disorder experiences about 10 episodes of depression, mania, hypomania, or mixed states.
   a. True
   b. False

6. Bipolar I (one) requires a diagnosis of a major depressive episode.
   a. True
   b. False

7. Individuals with Bipolar I (one) experiences mania, whereas an individual with Bipolar II (two) experiences hypomania
   a. True
   b. False

8. Rapid cycling of mood states refers to those who have _____ or more mood episodes within 1 year.
9. Which of the following symptoms of bipolar disorder can lead to a misdiagnosis of schizophrenia?
   a. Loss of interest
   b. **Motor problems (e.g., physical agitation, slowness, odd movements)**
   c. Sleep problems
   d. Risky behaviours
   e. Feeling of grandeur

10. Which of the following factors does **NOT** trigger bipolar disorder?
    a. Stress
    b. Chemical (medications or street drugs)
    c. **Imbalance of neurotransmitters**
    d. Destabilization of circadian rhythms (e.g., sleep-wake times)

11. What is the first line of treatment for bipolar disorder?
    a. Psychotherapy
    b. **Medication**
    c. Electroconvulsive therapy
    d. Light therapy

12. The gender ratio of bipolar I (one) disorder is equal.
    a. True
    b. False

13. Bipolar II (two) disorder often begins with a manic episode.
    a. True
    b. **False**

14. The interval between mood episodes tend to **decreases** as individual ages
    a. **True**
    b. False

15. Medications for bipolar disorder can be addictive.
    a. True
    b. **False**

16. For most people with bipolar disorder, their symptoms improve enough with psychotherapy, such that they don’t need other types of treatment
    a. True
    b. **False**
17. Psychosocial treatments include medication management, psychoeducation and peer support group.
   a. True
   b. False

18. Which of the following are helpful in preventing relapse of bipolar disorder?
    (Select ALL that apply)
    a. Medication management
    b. Social support
    c. Daily routines
    d. Coping strategies

19. Which therapy has been shown to treat unhelpful thoughts associated with bipolar disorder?
    a. Psychoanalysis
    b. Dialectical behaviour therapy
    c. Cognitive behaviour therapy
    d. Meta-cognitive therapy

20. Bipolar disorder diagnosis is associated with having a creative profession.
    a. True
    b. False
Appendix D: Explicit Stigma Measures

Vignette of Bipolar Disorder

John is 24 and has a diagnosis of bipolar disorder. In the past there were times where he felt very sad and low without there being a specific reason for it. During these times he doesn’t enjoy things that used to give him pleasure, hardly ever talks, and frequently worries about his future. He feels tired all the time, does not have an appetite, and believes he is a worthless person, who can never do anything right. In contrast to this and to his usual behaviour, he is currently in a very good mood without any specific reason. He is sometimes irritable, is much more talkative than usual, and talks very fast. He often talks loudly and over-confidently about new ideas and projects he wants to pursue, but constantly changes his mind about his plans. He believes he is different from everyone else due to having special abilities that mean he is particularly gifted and intelligent. He buys things he does not need and cannot afford. In the middle of the night he telephones people to tell them something allegedly important. He acts very impulsively, erratically, and will often wake up earlier than usual but still feel bursting with energy. He sometimes manages without any sleep and still doesn’t feel tired.
Personal Attributes Scale
Adapted by Ellison, Mason and Scior (2015) for bipolar disorder

Please rate each of the statements about John (the person described in the vignette) using the scale below:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. John is aggressive</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Definitely true</td>
</tr>
<tr>
<td>2. John has no self-control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Definitely true</td>
</tr>
<tr>
<td>3. John is dangerous</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Definitely true</td>
</tr>
<tr>
<td>4. John is unpredictable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Definitely true</td>
</tr>
<tr>
<td>5. John is frightening</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Definitely true</td>
</tr>
<tr>
<td>6. John depends on other people</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Definitely true</td>
</tr>
<tr>
<td>7. John is helpless</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Definitely true</td>
</tr>
<tr>
<td>8. John is needy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Definitely true</td>
</tr>
<tr>
<td>9. People like John are generally highly intelligent</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Definitely true</td>
</tr>
<tr>
<td>10. People like John are often more creative than other people</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Definitely true</td>
</tr>
<tr>
<td>11. People like John are more likely to be artists</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Definitely true</td>
</tr>
</tbody>
</table>
Emotional Reaction to Bipolar Disorder
Adapted from Angermeyer & Matschinger (2003)

Rate the extent to which you feel the following emotion toward John, the person described in the vignette

<table>
<thead>
<tr>
<th></th>
<th>1</th>
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<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all</td>
<td></td>
<td></td>
<td></td>
<td>Very Much</td>
</tr>
</tbody>
</table>

1. Fear
2. Uneasy
3. Insecure
4. Pity
5. Concern
6. Empathy
7. Desire to help
8. Dismay
9. Anger
10. Disgust
11. Ridicule
12. Desire to withdraw
13. Lack of understanding
14. Irritated
15. Embarrassed
Social Distance Scale
Penn et al. (1994) & Scior et al. (2011)

Based on the description of John, rate the statements using the scale following scale:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Definitely willing</td>
<td>Probably willing</td>
<td>Probably unwilling</td>
<td>Definitely unwilling</td>
</tr>
</tbody>
</table>

1. How would you feel about living next to John?
2. How about spending evening socializing with John?
3. How willing are you to make friends with John?
4. How about working closely with John?
5. How about having John marry into your family?
Appendix E: Implicit Stigma Measures

Single Category Implicit Attitudes Test

Instructions

Positive Practice trial

“Put your middle or index fingers on the E and I keys of your keyboard. Words representing the categories at the top (“negative” and “positive or bipolar disorder”) will appear one-by-one in the middle of the screen. When the item belongs to a category on the left (“negative”), press the left (E) key; when the item belongs to a category on the right (“positive or bipolar disorder”), press the right (I) key. Items belong to only one category. If you make an error, an X will appear – fix the error by hitting the other key.

This is a timed sorting task. GO AS FAST AS YOU CAN while making as few mistakes as possible. Going too slow or making too many errors will result in an uninterpretable score. Continue on with some practice trials.

Press the SPACE BAR to begin.”

Positive trial
“Sort the same 2 categories again.

Words representing the categories at the top ("negative" and "positive or bipolar disorder") will appear one-by-one in the middle of the screen. When the item belongs to a category on the left ("negative"), press the left (E) key; when the item belongs to a category on the right ("positive or Bipolar disorder"), press the right (I) key. Items belong to only one category. If you make an error, an X will appear – fix the error by hitting the other key.

This is a timed sorting task. GO AS FAST AS YOU CAN while making as few mistakes as possible. Going too slow or making too many errors will result in an uninterpretable score.

Press the SPACE BAR to begin.”

Negative practice trial

“See above, the 2 categories now appear together in a new configuration ("negative or bipolar disorder" and "positive"). Remember, each item belongs to only one group.

The rules stay the same: Words representing the categories at the top ("negative or bipolar disorder" and "positive") will appear one-by-one in the middle of the screen. When the item belongs to a category on the left ("negative or bipolar disorder"), press the left (E) key; when the item belongs to a category on the right ("positive"), press the right (I) key. Items belong to only one category. If you make an error, an X will appear – fix the error by hitting the other key.
This is a timed sorting task. GO AS FAST AS YOU CAN while making as few mistakes as possible. Going too slow or making too many errors will result in an uninterpretable score.

Press the SPACE BAR to begin.”

**Negative trial**

“Sort the same 2 categories again.

Words representing the categories at the top (‘negative or bipolar disorder’ and ‘positive’) will appear one-by-one in the middle of the screen. When the item belongs to a category on the left (‘negative or bipolar disorder’), press the left (E) key; when the item belongs to a category on the right (‘positive’), press the right (l) key. Items belong to only one category. If you make an error, an X will appear – fix the error by hitting the other key.

This is a timed sorting task. GO AS FAST AS YOU CAN while making as few mistakes as possible. Going too slow or making too many errors will result in an uninterpretable score.

Press the SPACE BAR to begin.”

**Stimuli words**

**Positive Attribute Words**
Worthy, able, confident, determined, happy, relaxed, nice, cheerful, approach, respect, care, admire

**Negative Attribute Words**
Dangerous, strange, fragile, miserable, boring, scared, nervous, disgust, reject, escape, despise, avoid

**Target Words**
Bipolar, manic-depressive, depression, mania
Appendix F: Participant Characteristics

Demographic Questionnaire

This is the end of the study. We would like to ask you some information for demographic purposes. Please answer the following questions.

Age (in years): ______

Gender:
- Male
- Female
- Other ______

What year of undergraduate education are you currently in?:
- 1st year
- 2nd year
- 3rd year
- 4th year
- 5+ year

Which psychology course are you currently enrolled in? (Select all)
- PSYC 101: Introduction to Biological and Cognitive Psychology
- PSYC 102: Introduction to Developmental, Social, Personality, and Clinical Psychology
- Other

Are you currently enrolled in or have you ever taken (select all):
- PSYC 300: Abnormal Psychology
- PSYC 401: Clinical Psychology
- Neither

Has bipolar disorder been covered in any of your psychology courses?
- Yes
- No
What is your cultural background?
- African or Caribbean/West Indian
- Central Asian/Middle Eastern (e.g., Israeli, Palestinian, Iranian)
- Caucasian (e.g., European, Australian)
- Chinese
- Japanese
- Korean
- Native (e.g., First Nations, Metis, Inuit)
- South Asian (e.g., East Indian, Sri Lankan, Pakistani)
- South or Latin American (e.g., Mexican, Brazilian, Chilean)
- Southeast Asian (e.g., Vietnamese, Cambodian, Thai)
- Other ________________

Were you born in Canada?
- Yes
- No

(If no to previous question) How many years have you lived in Canada? ______

Is English your first language?
- Yes
- No

If not, at what age did you learn to speak English? ______

Do you have any experience with mindfulness meditation?
- Yes
- No

How often do you practice mindfulness meditation?
- Rarely
- Monthly
- Once a week
- 2 - 3 times a week
- Almost every day
- Everyday
Familiarity with Bipolar Disorder

1. Prior to participating in this study, how much knowledge did you have about bipolar disorder? (Slider)

Not at all  Somewhat  Very knowledgeable knowledgeable knowledgeable
0 10 20 30 40 50 60 70 80 90 100

2. Do you know anyone who has been diagnosed with bipolar disorder?
   a. Yes
   b. No

   (If yes to question 2):
3. What is your relationship with this person?
   a. Family member
   b. Friend
   c. Romantic partner
   d. Co-worker
   e. Acquaintance
   f. Other (Please specify): _____________

4. How would you rate your interaction with this person on average?
   a. Very unpleasant/negative
   b. Somewhat unpleasant/negative
   c. Neither unpleasant nor pleasant
   d. Somewhat pleasant/positive
   e. Extremely pleasant/positive

5. Have you ever been diagnosed with bipolar disorder?
   a. Yes
      i. If you feel comfortable stating, when were you diagnosed?
   b. No
   c. Prefer not to state

6. Have you ever been diagnosed with a mental disorder?
   a. Yes
      i. If you feel comfortable, please specify which disorder you were diagnosed with
   b. No
   c. Prefer not to state
Appendix G: Interaction Task Instructions & Measures

Peer Debrief Questions

“As both of you have been informed, we are piloting a new “peer debrief” method for this study. A few HSP studies are trying this out to learn whether this method of debriefing is more useful than the traditional method where participants are debriefed by the research assistant, so you may have seen this in other HSP experiments already. You will be given a set of debriefing questions to answer together. Then we will ask you some questions about your experience with this peer debrief method, so we can learn how you liked it. Here are the questions you’ll be using for the debrief procedure.

Please take turns reading out each of the question out loud to each other and answer each one of them. I’ll be back in five minutes. I’ll leave a timer here so that you can keep track of the time. After this is over, I’ll meet with you individually for your feedback on this debriefing method and to answer any questions you might have about the study. Do you have any questions?”

Peer debriefing questions:
1. How many studies have you participated in prior to this one?
2. What was this experiment like for you? [confederate will disclose bipolar disorder diagnosis]
3. Were there any surprises?
4. What part of the study did you find most engaging?
5. What would you change about the experiment?
Interaction Task - Confederate Script

Scripted Component of Peer Debrief

Question 1: [Confederate reads question, participant answers first]
Confederate (C): Have you participated in other HSP studies? If so, how many?
Participant (P): participant responds
C: This was my 1st/2nd/3rd one [for this semester]
   - Change the answer depending on the time of semester:
     o In first two weeks of January: 1st one
     o After the first two weeks of Jan: 2nd one
     o End of March – April: 3rd one
   - If the participant asks which one you’ve participated in: A study about motivation.
C: Here your turn [hand the question paper to the participant]

Question 2: [Participant reads question, confederate answers first]
P: What was this experiment like for you?
C: I was actually surprised (it was uncanny/it was unexpected) because I have bipolar disorder. So it was interesting that you picked this one. How was it for you? [maintain neutral tone and manner]
   - We want to convey that it was surprising that the participant randomly picked bipolar because you have bipolar. Also we want to ask “how was it for you?” so that we don’t have to elaborate if the participant asks.
   - If the participant wants to know more about your diagnosis, convey to them that it’s complicated/a long story/ would be open to talking more about it later, but let’s first get through the questions. “It’s a long story-let’s get through the questions first”
P: participant responds
   - If the participant does not hand you the question paper, say “My turn to read the question” and gesture to receive the paper from the participant.

Question 3: [Confederate reads question, participant answers first]
C: Were there any surprises?
P: Participant responds
C: Well, other than the fact that this study was about bipolar disorder, this study was pretty similar to the last one I did. It was sort of what I was expecting.

Question 4: [Participant reads question, confederate answers first]
P: What part of the study did you find most engaging?
C: I enjoyed watching the video OR answering questions about bipolar disorder.
P: Participant responds

Question 5: [Confederate reads question, participant answers first]
C: What would you change about the experiment?
P: Participant responds
C: It's hard to say…I don’t know much about this whole research process/procedure.
If the participant does not respond to the previous statement, say: “I think we are done with the
questions now.”

Unscripted Component of Peer Debrief

Depending on how long it takes to get through the questions, there will be approximately 2
minutes for unscripted conversation with the participant. Do not initiate conversation with the
participant, wait for them to initiate. If they do not say anything for 15 seconds (count in your
head), you can say, “I guess we have X minutes according to the timer.”

General rule:
- The most important thing to remember is to NOT drive the positivity in during the
  interaction.
- Do not start a new conversation topic.
- If they ask you a question, you can mirror/parrot their question, by saying “how about
  you?” (e.g., which psych course are you taking?; Are you done your midterms?)
- Do not agree or side with them on any opinion they might have
  o “I really didn’t like the X question in the study” or “I really didn’t like (or like)
    PSYC101/lecture/etc”
    ▪ In response, convey a neutral stance. You can literally say: “Mmmm I’m
      neutral about it”, or “Mmmhmm, it’s ok”
  o Being in agreement or having the participants perceive that you are on their side
    about a topic or opinion (no matter how minor they are) might contribute to
    increasing the positivity in the interaction in a way that we don’t want.

Common questions participants might ask:
1. When were you diagnosed?
   a. A few months ago.
   o If they ask about more bipolar disorder, keep all answers vague.

2. What did you think about the study/video/questions?
   a. I thought it was to be expected.

3. Did you think that the video was accurate?
   a. Yeah I think so; it was pretty general and standard.

4. Which year are you in?
   a. I’m in second year. [would be appropriate to ask here “how about you?”]

5. Which psych course are you taking?
   a. I’m taking…[insert one of the following courses]
      i. PSYC101 – Catharine Rankin (TTh 9:30 – 11:00)
      ii. PSYC101 – Peter Graf (MWF 9-10)
iii. PSYC101 – Luke Clark (MWF 12-1)
iv. PSYC102 – Darko Odic (MWF 10-11/11-12)
v. PSYC102 – Eva Zysk (MWF 1-2)

• Lecture location: Centre for Interactive Research on Sustainability (CIRS)

6. Is psych your major?
   a. No
Affective Stigma toward the Confederate

This scale consists of a number of words that describe different feelings and emotions. Indicate to what extent you felt each of the emotions **during your interaction with your debriefing partner**.

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<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all</td>
<td></td>
<td></td>
<td></td>
<td>Very Much</td>
</tr>
</tbody>
</table>

1. Fear  
2. Uneasy  
3. Insecure  
4. Pity  
5. Concern  
6. Empathy  
7. Desire to help  
8. Dismay  
9. Anger  
10. Disgust  
11. Ridicule  
12. Desire to withdraw  
13. Lack of understanding  
14. Irritated  
15. Embarrassed
Willingness for Future Interaction

RA script:
“We are currently recruiting for a follow up study that will involve two people who have already participated in research together to engage in relationship and trust building exercises. For example, you will share answers to questions that have been designed to increase closeness between two individuals. You will be compensated for your time and this will not be for an HSP credit.

I’ll give you a few minutes to think about it. Please indicate your decision on this slip and leave it on the table. If you decide to participate, we will contact both of you to follow up about the study in the next couple of days. If you decide not to participate, we will not tell your partner about the study. I’ll come back in about 2 minutes.”

If they have any questions about the follow up study:
• What’s the compensation: “You’ll be paid $10 for an hour of your time.”
• When: “Study will be in the next week or two. Someone will contact you to schedule you in a few days.” We want to convey that it’s soon.
• How long?: “An hour”
• Does the debriefing partner know about the study?/Have you asked him/her yet?: “No- I’m asking you first. I have not asked your partner yet. I’ll only do so if you want to participate.” We want to convey that they get to decide whether the study participation actually will happen or not.
Impression Rating for Interaction Task

Confederate version:

Rate the extent to which the following emotions/traits apply to the participant during his/her interaction with you:

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<tr>
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<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at All/Very Slightly</td>
<td>A Little</td>
<td>Moderately</td>
<td>Quite a Bit</td>
<td>Extremely</td>
</tr>
</tbody>
</table>

1. Uncomfortable
2. Friendly
3. Tense
4. Standoffish
5. Rigid
6. Frightened
7. Cruel
8. Warm
9. Pleasant
10. Likeable

Thin slice coder version:

Rate the extent to which you observe the following emotions and traits in the target participant [one sitting in the right half of the video frame].

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Not at All/Very Slightly</td>
<td>A Little</td>
<td>Moderately</td>
<td>Quite a Bit</td>
<td>Extremely</td>
</tr>
</tbody>
</table>

1. Uncomfortable
2. Friendly
3. Tense
4. Standoffish
5. Rigid
6. Frightened
7. Cruel
8. Warm
9. Pleasant
10. Likeable
Appendix H: Suspiciousness Check

1. Sometimes participants in research studies have ideas about what they think the researchers are examining. In the space below, briefly describe what you think the study is about. What do you think the researchers are investigating?
   
a. At what point during the study did you think this?

2. Did you know Dr. Barnes prior to participating in this study?
   
a. If so, were you aware that he has a diagnosis of bipolar II disorder?