5-31-2017

Determined Wellness: The Influence of Mental Illness Models Upon Treatment Outcome Expectancies and Treatment Engagement

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DETERMINED WELLNESS: THE INFLUENCE OF MENTAL ILLNESS MODELS UPON TREATMENT OUTCOME EXPECTANCIES AND TREATMENT ENGAGEMENT

A Dissertation Presented

By

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Submitted to the Office of Graduate Studies,
University of Massachusetts Boston,
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

May 2017

Clinical Psychology Program

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ABSTRACT

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May 2017

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Multiple campaigns geared towards reducing public and self-stigma associated with depression, and increasing help-seeking behaviors have been launched in the past two decades. There has been an increase in promoting psychoeducation on the biological bases of mental illness. Recent international studies have documented that this increase in public knowledge has not reduced stigma. Indeed, growing evidence suggests that biological models, in comparison to other causal models of mental illness, decrease people's sense of self-efficacy and self-control, and decrease positive expectancies of treatments and prognosis–among those with and without mental illness. Individuals who have encounter health services, however, hold more positive and realistic expectancies of treatments than those who have not. Therefore, adequate education about mental illness and its treatment by providers is key at improving treatment expectancies and engagement. Results documented that biological explanations increased biological causes

and reduced endorsement of social and psychological causes, led to decreases in endorsement of non-professional help, and increased endorsement of positive outcome expectancies for attending psychotherapy. Second, psychosocial explanations increased endorsement of social causes, increased likelihood in engaging in psychotherapy, and increased endorsement of positive outcome expectancies for attending psychotherapy and taking psychiatric medications. Third, biopsychosocial conditions produced increases in endorsement of taking psychiatric medications and increased endorsement of positive outcome expectancies for attending psychotherapy. Fourth, control condition increased endorsement of taking psychiatric medications and increased endorsement of positive outcome expectancies for attending psychotherapy. There was no interaction effect of self-stigma for attending psychotherapy or taking psychiatric medications; however, main effects of time suggest that self-stigma for attending psychotherapy and taking psychiatric medication reduced across time. Moreover, after treatment education there were no interactions between time and condition. However, main effects of time showed increased likelihood taking psychiatric medications and decreased likelihood seeking non-professional help, increases positive outcome expectancies of treatment, and decrease in self-stigma for seeking treatment. The findings of the current study suggest that biologically based psychoeducation of depression may hinder patients. It is most optimal to include and highlight the effect of psychosocial factors of depression through psychoeducation campaigns.

ACKNOWLEDGEMENTS

First, I would like to thank my mentor and chairperson of my dissertation committee, Heidi Levitt, for the support and encouragement that she has given me for the past six years. I am forever grateful for the advice and guidance, and for giving me a space to explore my identity and find my own voice in the field of clinical psychology. Second, I would like to thank Ester Shapiro for all the support she has provided me throughout my doctoral training from social cultural basis of behaviors to independent studies and qualifying exam, and finally this dissertation project. I could not have asked for a better committee member and advisor throughout this process. Thank you for helping me cultivate a mind that is creative, critical, and authentic. Lastly, I cannot express enough gratitude to Takuya Minami for the multiple consultations and feedback on methods and analysis.

Also, I would like to thank my parents, Hugo Surace and Susana Corte, for all the emotional and financial support that they have provided me throughout my doctoral training. I could have not achieved this milestone if it was not for their continual love and care. Also, I want to express my gratitude to my brother, Juan Surace, and sister-in-law, Monica Noguchi, for motivating me in times of waning ambition. I am grateful of all the support that I have received from classmates, faculty, and staff in Department of Psychology and the Clinical Psychology program at UMass Boston. Finally, I would like to express my gratitude to the Doctoral Dissertation Research Grant Program at UMass Boston, for helping fund this project.

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INTRODUCTION

It is estimated that around 25% people in the United States (US) have been diagnosed with a mental illness and that 50% of adults will develop at least one psychological disorder in their lifetime. The economic burden of mental illness and its medical consequences is substantial, costing up to $300 billion (CDC, 2013). Depression, one of most common psychological disorders, has been rising from 6.6% to 9% with adults meeting diagnosis from 2006 to 2008 (CDC, 2013). There are multiple treatments for depression ranging from lifestyle changes to psychotherapy and pharmacotherapy; however, less than 40% of people with a mental illness actually receive any treatment at all (Kessler et al., 2001).

Financial and situational barriers have been cited as factors that influence treatment engagement and help-seeking (Kessler et al., 2001). However, changes in U.S. policy, such as the Affordable Health Care Act and the Mental Health Parity Act, promised hope for those who lack access to mental health services (Beronio, Glied, & Frank, 2014). As the health care system continues to change, psychological and attitudinal barriers to obtaining services may become more apparent. Currently, negative beliefs that psychotherapy is for weak people, that individuals should solve problems on

their own, and that antidepressants lead to addiction continue to interfere with seeking help (Clement et al., 2014; Tucker et al., 2013).

In many instances, these attitudinal barriers do not reflect the reality of the cost-effectiveness and efficacy of currently available psychiatric and psychological treatments. A US-based meta-analysis has shown that both, psychotherapy and psychiatric medications, are helpful to individuals diagnosed with depression and anxiety (e.g. Roshanaei-Moghaddam et al., 2011). Moreover, recent cost-effectiveness meta-analysis in the United Kingdom (UK) has documented that cognitive therapy (CT) and combination therapy (pharmacotherapy and CT) had better outcomes and were more cost-effective than pharmacotherapy alone (Koeser, Donisi, Goldberg, & McCrone, 2015). Beyond monetary restrictions, the efficacy of pharmacological and psychotherapeutic treatments still remains in question. For instance, a second meta-analysis completed in the UK documented that pharmacotherapy effects for moderate to severe depression may be attributed to placebo effects rather than responsiveness to actual medication (Kirsch et al., 2008). Whether reduction in psychiatric symptoms is due to psychotherapy or placebo effects of pharmacotherapy is still contentiously debated. Internationally, the debate has resulted in contradictory guidelines related to recommended treatments of mild depression (Cosgrove, Bursztajn, Erlich, Wheeler, & Shaughnessy, 2013), with many countries removing the prescription of medication.

Therefore, findings from these meta-analyses have implications for health and mental health providers as these professionals are responsible for providing education about and referrals to adequate evidence based treatments. In most instances the burden has fallen on primary care physicians (PCPs) to make decisions about depression care

(Young, 2008). However, their diagnostic skills and treatment recommendations have come into question in the past few years as mixed findings suggest that PCPs over-diagnose or undertreat depression in their patients (Simon, Fleck, Lucas, & Bushnell, 2004).

In one study, Lawrence and colleagues (2012) observed treatment recommendations practices of PCPs (n = 896) and psychiatrists (n = 312) for a 56 year old fictional vignette character seeking help for symptoms of mild depression. Their study recorded that psychiatrist (68%) and PCPs (56%) were "very likely" to prescribe antidepressants for mild depression. In addition, only 12% of the PCPs and 44% of the psychiatrist would provide counseling to the mildly depressed vignette character, and only half of the psychiatrist and PCPs were "very likely" to give a referral to a psychologist or counselor. Overall, these finding shed light on the treatment recommendation tendencies of this particular group of medical professionals. While the study could not account for patients' treatment preferences, studies have shown that PCPs tend to not engage with their patients on shared decision making for depression care (e.g. Young, 2008).

Unfortunately, these treatment recommendation trends fly in the face of empirical findings, professional guidelines, contemporary models of recovery, and ethical protocols that suggest that pharmacological treatment may not be the best intervention for all depressive illnesses. For instance, the American Psychiatric Association (APA, 2010) suggests that a combination of psychosocial and pharmacotherapies are helpful across levels of severity for depression, while the National Institute for Health and Clinical Excellence in the UK advises against prescribing medication to mildly depressed clients

(BPS, 2010). Also, the National Mental Health Association (NIMH, 2011) suggested that patients with mild to moderate depression would fare best in psychotherapeutic treatments.

Moreover, the tendency to prescribe medications over other treatments stand in contradiction with widely accepted recovery models that developed from the consumer/survivor movement of the 1970's (Davidson & Roe, 2007; Frese & Davis, 1997). The consumer/survivor movement, which established itself as a protest against the over medicalization of psychiatric conditions and increased hospitalization, sought to empower patients to choose their own path towards recovery. There are multiple definitions of recovery; however, Substance Abuse and Mental Health Services Administration (SAMHSA, 2012) has developed a working definition, which conceptualizes recovery as a holistic process and highlights the importance of hope, respect, strengths and responsibility, and self-determination and direction. In addition, recovery is holistic and culturally-based, and considers the importance of allies/peer support, relationships/social networks, and could take multiple forms of interventions.

In addition, a recent meta-analysis of 34 studies on patient's treatment preference for anxiety, depression and other disorders in primary and specialty settings recorded that psychological treatments were preferred over psychopharmacological treatments (McHugh, Whitton, Peckham, Welge, & Otto, 2013). Also, Jorm (2012) recorded that treatment choice changed with levels of perceived severity of the condition, starting with self-help and moving towards professional help. Moreover, people's preference for non-professional help is supported by empirical studies demonstrating the lifestyle management (i.e. diet, exercise, and alcohol and smoking; Berk, Sarris, Coulson, &

Jacka, 2013), tai chi (Yin & Dishman, 2014; Wang et al., 2013), and social support (Santini, Koyanagi, Tyrovolas, Mason, & Haro, 2015). It is evident that medical professionals have a different practice than the suggested psychiatric guideline and contemporary models of treatment and recovery, and heir patient's treatment preferences.

What might account for these monolithic treatment recommendations in the face of empirical findings and institutional guidelines? These changes in attitude may be contextualized in the backdrop of social, historical, and institutional forces. For instance, in 1989 George Bush and the American congress declared that the 1990s was "the decade of the brain" (Miller, 2010), which prioritized the conceptualization of psychological disorders using genetic and neurobiological models. Paralleling these changes was direct-to-consumer advertising for antidepressants, which between the year 1989 to 2003 increased from $12 million to over $3 billion (Kravitz et al., 2005; Rosenthal, Berndt, Donohue, Frank, & Epstein, 2002). Researchers have found financial ties between the psychopharmaceutical industry and members of the APA in charge of developing treatment guidelines (Cosgrove et al., 2013). This evidence of an unaccounted conflict of interest, and a possible explanation for the differences in international guidelines of depression. In addition, the last three decades has seen an increase in conceptualizing psychological problems as physical illnesses, which propagates the idea that all mental health issues are diseases of the brain (Banner, 2013; Miller, 2010). These formulations are present in public resources that aim to educate population on causal models of mental illness.

Questioning Causal Models of Mental Illness

In a widely distributed depression psychoeducational booklet (NIMH, 2011), NIMH delineates a biopsychosocial causal model of depression stating that "most likely, depression is caused by a combination of genetic, biological, environmental, and psychological factors." However, it further defines depressive illnesses as "disorders of the brain," and notes that "trauma, loss of a loved one, a difficult relationship, or any stressful situation may trigger a [brain-based] depressive episode." Such explanations highlight that psychosocial factors work as triggers and not causes, implicitly reducing the disorder to neurobiological factors and hereditability. Unfortunately, the NIMH psychoeducational booklet, which includes an explicit statement that depressive illnesses are "disorders of the brain," contradicts the current biopsychosocial model widely-endorsed in psychiatry (Engel, 2012). The biopsychosocial model proposes that mental illness have multiple predisposing factors that are biological, psychological, and/or social in character. In the more refined understanding of the biopsychosocial model it is the interaction between all these factors, and not one factor, that increases the susceptibility to developing a psychological disorder.

Efforts to popularize the biological perspective of mental illness are well intentioned, driven by the hope that this might result in more compassionate attitudes and reduce stigma towards the sufferer by suggesting that the disease is beyond people's control (Angermeyer, Holzinger, & Matschinger, 2009; Bar Levav, 1976; Crocetti, Spiro, & Siassi, 1971; Miller, 2010; Pescosolido, 2013). However, a recent international meta-analysis utilized population-based studies and implemented a time-trend analysis to observe changes in attitudes towards individuals with mental illness across time

(Schomerus et al., 2012). Results recorded that, across the world, aggressive implementation of mental health literacy promotion programs based on the brain-disease model has not reduced stigma for depression and schizophrenia; the level of stigma towards individuals with mental illnesses has remained stable for the last 20 years, but knowledge regarding mental illness and biologically based causal models has increased.

Given their ineffectiveness at reducing stigma, campaigns that perpetuate a one factor causal model have come into question by the international community (Angermeyer et al., 2009; Miller, 2010). Some researchers propose that biological explanations of psychiatric disorders may generate negative attitudes towards people with mental illness, because they imply that people with a disorder are essentially and categorically different from "normal" people (see genetic essentialism and neuroessentialism; Dar-Nimrod & Heine, 2011; Haslam, 2011). This notion might be further catalyzed by a neglect of recent developments within the epigenetics and neuroplasticity literature that have brought into question our ideas that genetics are immutable blueprints and that the mature adult brain is unchangeable (Gregurek, 2012; Zaman, 2010).

Moreover, causal explanations of mental illnesses have been shown to affect perceptions of illness, stigma, prognosis, and treatment preferences. Using data from the General Social Survey of a nationally representative samples, Phelan, Yang, and Cruz-Rojas (2006) documented the effects of biological/genetic explanations for mental disorders on participants who estimated the perceived effectiveness of treatment for individuals represented in a vignette as having depression or schizophrenia. According to the study's results, no differences were found regarding treatment recommendations for a

vignette character diagnosed with schizophrenia or depression. However, participants who endorsed genetic causes to the disorder were more likely to recommend hospitalization and psychiatric medication for the vignette character. Researchers concluded that attributions of biological causal factors indicated that the problems were seen as severe and chronic, which explains the endorsement of more invasive interventions. In addition, biological causal explanations further reduced the participants' optimism regarding the helpfulness of mental health professionals and the treatment that those professionals provide.

Simialrly, Lam, Salkovskis, and Warwick (2005) compared participants' general attitudes towards mental illness and self-control skills across three experimental conditions: biological, psychological, and control explanations of mental illness. Participants were presented with a wide range mental illnesses, which included mood and psychotic disorders. Participants were then presented with one of three causal explanations: (1) a biological explanation that stated, "research suggests that these biologically based disorders may be the result of genetic factors"; (2) a psychosocial explanation that stated, "research suggests that these psychologically based problems may be the result of environmental risk factors"; (3) and a control conditions that stated, "research suggests that the causes of these disorders are not yet entirely clear."

Researchers documented that participants in the biological condition perceived individuals with a mental illness to be more disabled, less likely to be cured, more likely to harm themselves, and more likely to need professional help and hospitalization in comparison to individuals in the psychological condition. Lam, Salkovskis, and Warwick (2005) findings highlighted the effects of causal models on mental illness perceptions;

however, the study did not include the more prevalent biopsychosocial explanation (e.g. research suggests that mental illness is caused by psychological, biological, and environmental factors) used by most mental health care providers. In addition, explanations regarding mental illness were reduced to a single factor (e.g., genetic vs environmental), which do not represent the etiological nuances or complexity of mental illness.

In a second experimental study, Deacon and Baird (2009) asked a sample of undergraduates to imagine that they were experiencing major depression and assessed their attitudes regarding the credibility of explanations, treatment efficacy, prognosis, and self-stigma. The researchers experimentally manipulated the explanation of depression provided to the participant—either a chemical imbalance (depression is medical illness that is no different from any other disease and is caused by neurotransmitter imbalance) explanation or biopsychosocial (depression is a common mental disorder with multiple biological, psychological, and social causes) explanation. Their results recorded that participants endorsed higher credibility of the biopsychosocial than chemical imbalance explanation. Moreover, participants who received chemical imbalance explanations reported on average less self-stigma compared to individuals in the biopsychosocial condition.

However, participants who received the biopsychosocial explanations had more positive perceptions of prognosis compared to the chemical imbalance explanation. Participants who received chemical imbalance explanations perceived medication as the most efficacious treatment. In contrast, participants in the biopsychosocial condition perceived that changing one's lifestyle and attitudes was the most efficacious treatment

for depression. These trends were still present even after the researchers controlled for pre-existing biochemical and psychosocial beliefs.

Deacon and Baird (2009) further claimed that causal explanations affect attitudes towards mental illness and expectations regarding treatment. According to their findings, causal explanations may have a priming effect on the receptivity of a particular treatment. Caution should be taken when generalizing these results, however. The study relied primarily on a sample of university students in abnormal psychology classes, which were already exposed to theoretical models of depression. Moreover, while causal models of mental illness are important at influencing treatment preferences, researchers failed to consider the role of treatment psychoeducation and participant's baseline attitudes towards treatment in general.

Lam and Salkovskis (2007) studied the effects of causal beliefs of panic disorders on psychotherapy treatment expectancies among individuals diagnosed with depressive and anxiety disorders. Participants were presented with a video of a clinical interview for a person who suffered panic attacks. Participants were placed into three different conditions: biological or psychological explanation, or a control condition. The results documented that, compared to the psychological explanation group, participants who received biological explanations saw the person as less likely to progress in treatment, more likely to need long term treatment, and at higher risk of harming self and others. Unfortunately, results from this study are affected by the small sample size and limited measures. However, these findings further contribute to understanding the effects of biological explanations. Lam and Salkovskis's (2007) study suggests that while

biological causes seem to legitimize a disorder, they also seem to reduce the perceived effectiveness of psychotherapy for individuals diagnosed with a mental illness.

Similar findings have been observed among a sample of participants who had experienced and been diagnosed with depression. Kemp, Lickel, and Deacon (2014) completed a study where participants were informed that a mouth swab test detected the presence of chemical imbalances that lead to depression. Participants were placed in either biological causes (presence of neurotransmitters being imbalanced) or control condition (no imbalance detected). Participants in the chemical imbalance condition had greater negative attitudes towards prognosis and lower negative mood regulation expectancies in comparison to participants in the control condition. Self-stigma did not differ between the conditions, which suggested that biological explanations might not affect individuals' levels of stigma; however, it did have a negative impact on individuals' perceived self-efficacy and possibility for recovery.

Moreover, participants in the control condition perceived both psychotherapy and pharmacological therapy as credible forms of treatment, while participants in the chemical imbalance condition only perceived pharmacological treatment as more credible and effective than psychotherapy. These results confirm prior research indicating the effects that biological causal explanations have on individuals' expectancies. Unfortunately, researchers did not include psychosocial and biopsychosocial explanations in their study bringing to question whether providing such explanations might influence their attitudes towards treatment.

It is evident that in the past few years there has been a growing interest in understanding the effects of causal models of mental illness on illness perceptions,

treatments outcome expectancies, and stigma. The general trends of these experimental studies, along with population based research, seems to suggest that biological explanations do not fully resolve the problem of stigma, and, in some instances, create a lack of hope and negative treatment expectancies for evidence based psychotherapies. Moreover, these causal models of mental illness seem to implicitly prime individuals to accept certain treatments over others, and reduce their sense of control over their illness. However, the acceptance of a particular treatment may be influenced by other factors than etiological explanations. For instance, perceptions about one's relation to treatment may have effects on individuals desire to engage or expect positive outcomes of seeking professional help.

Help-Seeking and Treatment Seeking Self- Stigma

Help-seeking theory suggests that the decision to seek help involves information about symptoms, knowledge about resources, and the willingness to disclose the problems to others (Rickwood et al., 2005). Overall, attitudes towards seeking treatment have changed in the past four decades for the worse, particularly in regards to psychotherapy. A cross temporal meta-analysis on attitudes towards seeking mental health services among American university students culled studies from 1968 to 2008 that utilized the Attitudes towards Seeking Professional Psychological Help Scale—a measure that emphasizes psychotherapy as a psychological treatment (Mackenzie, Erickson, Deane, & Wright, 2014). The findings of the study suggested that in the last 40 years negative attitudes about seeking psychological treatments have increased among this population. While the researchers note that attitudes regarding seeking treatment (specifically psychotherapy) have changed, the studies included in the meta-analysis

failed to account for participants' preferences in treatment (e.g. medication versus psychotherapy). Therefore, while treatment seeking attitudes towards psychotherapy have become more negative this may not be the case for psychopharmacological treatment.

One way to understand changes in attitudes towards seeking treatment may be related to the information that an individual has regarding different treatments and how one is perceived by others for seeking such treatments. For instance, stigma (a barrier to mental health care) has been found to lower people's self-image, -esteem, -efficacy, and willingness to seek treatment (Ben-Porath, 2002; Corrigan, 2004; Link & Phelan, 2001; Vogel, Wade, & Haake, 2006). Public-stigma, the negative attitudes held by society about individuals who have a mental illness, is positively related to self-stigma. It is hypothesized that public-stigma leads individuals to internalize negative messages about mental illness and see themselves through those negative lenses (Corrigan, 2004; Link & Phelan, 2001; Vogel, Wade, & Hackler, 2007). A review of the literature that included 271 quantitative and qualitative studies on help-seeking and mental health related stigma documented that individuals feared social judgment, rejection, ridicule, and discrimination from others (Clement et al., 2014). Also, participants across studies reported viewing people with mental illness as weak, crazy, lacking will power, dangerous, not normal, different, unable to recover, unreliable, contagious, bad parents, spiritually failing, and exaggerating and fabricating the illness; individuals who internalized stigma (i.e., self-stigma) endorsed feeling of shame and embarrassment.

Tucker and colleagues (2013) documented that self-stigma is composed of two constructs. In one hand, self-stigma is connected to having a mental illness and the negative attributions made towards people of that group. One the other hand, self-stigma

is associated to treatment seeking behaviors. Treatment seeking self-stigma results in avoiding and foregoing seeking help as a way to decrease the possibility of being stigmatized by others (Corrigan, 2004; Vogel et al., 2006).

Jennings and colleagues (2015) observed the effects of perceived stigma for seeking treatment, self-stigma related to treatment seeking, and self-reliance on treatment seeking behaviors among 246 college students. Using a mediated model they demonstrated that individuals with greater perceived self-stigma for seeking treatment (what others might think of them for seeking help) had higher self-stigma for seeking treatment (a person's attitudes towards themselves for seeking treatment), which in turn was related to greater self-reliance and more negative attitudes towards seeking treatment. These findings applied to participants with and without mental health problems. However, participants who did not endorse mental health problems also had a significant direct effect between self-stigma for seeking treatment and negative attitudes towards seeking treatment. Individual who believed that others would judge them for seeking treatment also held those self-stigmatizing attitudes toward themselves, which impeded them from seeking help.

Exposure to Treatment Education

Multiple national mental health associations and institutions suggest that both medication and psychotherapy are helpful in relieving depression. For instance, the NIMH's depression pamphlet (NIMH, 2011) states that, "For mild to moderate depression, psychotherapy may be the best option. However, for severe depression or for certain people, psychotherapy may not be enough". Moreover, following a description of medication treatment for depression the American Psychiatric Association claims that

"Psychotherapy, or 'talk therapy,' is sometimes used alone for treatment of mild depression; for moderate to severe depression, psychotherapy is often used along with antidepressant medications." Also, the American Psychological Association suggests that "medications can be very helpful for reducing the symptoms of depression in some people, particularly in cases of moderate to severe depression. Often a combination of psychotherapy and medications is the best course of treatment." Although these American recommendations lie in contrast with those from the UK and Netherlands, which correspond to the meta-analytic evidence on drug treatments and do not recommend psychiatric medication for depression at all (Cosgrove et al., 2014), some recommendation of both psychotherapy and medicine appears standard in the US.

Unlike psychopharmacological treatments that utilize direct-to-consumer advertisements to educate their consumers, information regarding psychosocial interventions do not reach the general population unless it is through educational pamphlets, the health system, or through personal experience. Furnham (2009) in a descriptive analysis of psychotherapy literacy documented that overall individuals have optimistic views about the effects of psychotherapy. However, those who attended psychotherapy were more likely to have realistic expectations of therapy and its usefulness. Exposure to psychiatric treatment also has been found to reduce stigma towards treatment (Schomerus, Matschinger, & Angermeyer, 2009). For those who have not attended treatment, views of psychotherapy may be dependent upon other factors, such as public opinion and media portrayals of mental health providers to understand how such treatments work.

In a study on the effects of television on help-seeking attitudes and stigma, Vogel, Gentile, and Kaplan (2008) observed the relations between viewing comedy and drama television shows and stigma towards seeking psychological treatment. The researchers observed cultivation effects (Gerbner, 1969), or the strengthening effects of repeated exposure to images and messages from television on people's expectations and beliefs. Their analysis utilized structured equation modeling to demonstrate the path relation between these variables. The findings recorded that frequent exposure to comedy and drama shows was related to increased stigma, which was related to less favorable attitudes towards psychotherapy, and in turn to less willingness to seek help. In addition, frequent exposure to drama and comedy shows was also related to less anticipated benefits of disclosing information to a therapist and less favorable attitudes towards psychotherapy and, in turn, less willingness to seek psychotherapy. Vogel, Gentile, and Kaplan's (2008) study represents an important finding on the constructions of psychotherapy and the possible affects that media has on attitudes towards psychotherapy and their effect on treatment engagement. Unfortunately, this model did not account for the exposure to mental health promotion programs or other psychoeducational interventions nor did it account for other treatments such as medications.

Client Treatment Outcome Expectancies

Frank and Frank (1991) delineated the importance of individuals' beliefs regarding the healing properties of the practitioner. They proposed that clients' faith and hope in treatment results in psychotherapeutic gains may be attributed to placebo effects, and not the psychotherapies themselves. Later on, research was conducted that demonstrated that such claims were difficult to maintain as psychotherapy does not have

a placebo quality (inert substance) in the same way that it does within physical health research (Patterson, 1985). However, this finding does not annul the idea that expectations of a treatment may have an effect on psychotherapy outcome.

Unlike the concept of hope and faith, client treatment expectancies are defined as the client expectations regarding the process, client-therapist role, and outcome in treatment. In particular outcome expectancies refers to the "expectations that therapy will lead to change" (Arnkoff, Glass, & Shapiro, 2002, p. 335). The research of treatment expectancies spans over a 50 year period, and the findings from the clinical and social psychological literature have observed the trend that expectancies have major influences in the client's actual outcomes in and perceptions of treatment (Greenberg, Constantino, & Bruce, 2006). Given such a long period of time several reviews have been conducted regarding the effect of treatment expectancy and outcomes (Constantino, 2012; Dew & Bickman, 2005; Glass, Arnkoff, & Shapiro, 2001; Greenberg et al., 2006; Noble, Douglas, & Newman, 2001). In general expectancies have been divided into two types of expectancies: (1) outcome of the treatment and (2) the role of the therapist and client.

Noble, Douglas, and Newman (2001) reviewed the literature regarding expectation for pharmacological and psychotherapeutic treatments prior to the 1980s and post-1980s (until 2001). Overall, their review noted an underlying trend regarding outcome expectancies where clients were more likely to prefer and expect better outcomes from psychological interventions or combination treatment (medication and psychotherapy) in comparison to other interventions. However, severity of symptoms were related to more favorable attitudes towards medication treatment. In addition, positive expectations about treatment were related to better outcomes, particularly in

studies conducted post-1980s, which asked clients to assess their own symptoms in comparison to studies pre-1980s that relied on therapists' assessments of their clients.

Similar findings have been observed across other reviews of treatment expectancies that primarily involved psychotherapy as an intervention (Constantino, 2012; Dew & Bickman, 2005; Glass et al., 2001; Greenberg et al., 2006). Overall, researchers across review studies indicated that expectancies were either positively related to better treatment outcome or had no significant effect to outcome, suggesting that the possible inclusion of treatment expectancies would either help or make no difference rather harm clients. Tinsley, Bowman, and Ray (1988) reviewed the literature related to experimental manipulations of clients' expectations of psychotherapy. Their findings suggest that the most helpful modes for changing client's expectancies of psychotherapy involved the use of videotape and audiotape material in comparison to clinical interviews, verbal instructions, or printed material.

For instance, a study with 62 participants who were about to enter psychotherapy treatment were placed in one of two conditions, a treatment orientation psychoeducation or a control condition (Zwick & Attkisson, 1985). Participants in the treatment orientation condition were shown an 11-minute video that included information about the function of psychotherapy, clarification of client and therapist relationship, normalized the initial discomfort of attending therapy, warned of clients avoidance of therapy after difficult sessions, noted the slow and non-linear gains in psychotherapy, foreshadowed that discomfort of discussing difficult topics, and provided general positive outcome assessments of psychotherapy in reducing anxiety and depression. In comparison to their

control group counterparts, participants in the orientation psychoeducation condition demonstrated greater decrease in their initial symptoms at one-month follow-up.

Similar findings have been demonstrated in psychiatric consultations. Douglas, Noble, and Newman (1999) showed a 10-minute video to participants who were going to attend a psychiatric consultation. The video included information about the role of the psychiatrist, role of the patient, causes of psychological problems, content of the assessment interview, confidentiality, possible outcomes, issues concerning the stigma of mental illness, and patients' fears of 'going mad' as well as a simulation of the consultation process. In comparison to participants in the control condition, these patients had more accurate expectations than those who did not view the video. The findings imply that the there is an overall positive effect of introducing clients to information about an encounter with psychiatrists. Both Douglas and colleagues (1999) and Zwick and Attkisson (1985) provided substantial evidence supporting future clients' preparation for their encounters with psychiatric and psychological care providers. Unfortunately, these studies are quite outdated and the psychological sciences have progressed in their method of conceptualizing and treating psychological disorders. The fact that majority of treatment expectancy studies have taken place between the 1960s and 1980s suggests that the science of expectancies has been neglected in the past few decades.

Only a few contemporary studies have assessed the usefulness of including expectancies producing or enhancing techniques. Jorm and colleague (2003) observed in an Australian population based sample of depressed individuals the effect of different psychoeducation interventions. In one condition, participants were provided with an evidence based consumer guide about depression and its treatments versus a general

pamphlet about depression. Their findings recorded that after a 6 month follow up participants in the evidence based consumer guide viewed cognitive-behavior therapy, electroconvulsive therapy, and the use of St. John warts for depression as more helpful in comparison to other treatments. Unfortunately, researchers did not assess expectations or how likely individuals were to seek a particular intervention, other than asking individuals to rate how helpful different interventions might be. In addition, Jorm and colleague (2003) did not find the effects of their intervention in comparison to control due to small sample size of the intervention group

While there has been a neglect of treatment expectancies research since the 1980s, recently there has been a resurgence in this area of research. In a pilot study of a 30 minute intake for CT with an expectancy enhancement (EE) protocol, Constantino (2012) recorded a decrease in hopelessness and depressive symptoms among a small sample (n = 14) of depressed clients. The EE protocol included multiple pre- during- and reactive during- treatment interventions such as tailoring CT rationale to clients' problems, delivering hope-inspiring messages, including expectancy-enhancing statements based on clients' strengths, increasing clients' internal locus of control, and providing a non-technical review of research on CT for depression. While these findings were promising, the study utilized a small sample, and these participants already were seeking treatment and therefore one cannot fully know the effects on motivation to seek treatment. In addition, the EE protocol was created to enhance the reuptake of a particular psychotherapy when multiple therapies have been found to be useful for depression (Levant et al., 2006; http://www.div12.org/psychological-treatments/treatments/).

In another contemporary mixed-method study of expectancy enhancement interventions among older adults, Woodhead, Ivan, and Emery (2012) observed the effects of inducing positive pre-therapy expectancies. The researchers provided patients, who were recommended psychotherapy by their doctors, with standard psychotherapy outcome data. The results demonstrated that participants who initiated psychotherapy treatment viewed the outcome data as important in making their decision to initiate therapy. Moreover, a qualitative analysis of interviews on participants' exposure to outcome data shared the theme that hopefulness of treatment success increased after being provided with this information.

Overall, the expectancy outcome literature seems to suggest that describing the process of therapy and helping clients have realistic expectation about treatment results increases hopefulness and better treatment outcome as a whole. In addition, interventions that provide standard information about psychotherapy seem to be good tools for improving client's attitudes and engagement with treatment. To date, no study has observed whether providing psychoeducation to clients may have neutralizing effects regarding the implicit treatment suggestions produced by etiological models of mental illness. In other words, does providing patients with information about intervention undo pessimistic outlooks upon treatment effects that they may hold due to causal models of mental illness?

CHAPTER 2

CURRENT STUDY

The purpose of the current study is to assess the effects of causal models of mental illness (biological, psychosocial, biopsychosocial, and control) upon treatment engagement and outcome expectancies beyond the effects of treatment psychoeducation among adults in the general population. This aim will use a three-part experimental vignette design where participants are asked to imagine what is like to be a character in a vignette who is suffering from depression and decides to attend a doctor for help. A vignette will be presented that describes a person with depression followed by the brief illness perceptions questionnaire, perceived etiology of depression, psychotherapy and medication outcome expectancies, treatment seeking self-stigma and treatment engagement (Time 1—Baseline). In a second vignette, a doctor provides a depression diagnosis as well as one of three forms of psychoeducation (a biological, psychosocial, or biopsychosocial causal explanation) or no description of causes (i.e., a control condition). Participants will be re-assessed on perceived etiology of depression, treatment seeking self-stigma, psychotherapy and medication outcome expectancies, and treatment engagement (i.e., self-reported perceived likelihood of engaging in psychotherapy, medication, and non-professional help) in order to observe the effects of causal models of

mental illness upon these outcome variables (Time 2—Psychoeducation). Afterwards, all participants will be funneled into a third vignette, where the doctor provides treatment psychoeducation regarding psychotherapy and medication. The third vignette will be used to observe the effects of treatment psychoeducation on psychotherapy and medication outcomes expectancies, and treatment engagement (Time 3—Treatment education). Participants will be re-assessed on perceived etiology of depression, treatment seeking self-stigma, psychotherapy and medication outcome expectancies, and treatment engagement (i.e., self-reported perceived likelihood of engaging in psychotherapy, medication, and non-professional help; see Appendix I for condition Flowchart).

Specific Aims and Hypothesis

Aim 1. What is the relation between illness perceptions (consequences, timeline, concern, and emotional response) on attending psychotherapy and taking psychiatric medication outcome expectancies at baseline?

a) Hypothesis: Illness perceptions of greater severity will have a positive relation to positive outcome expectancies of medication and a negative relation to positive outcome expectancies of psychotherapy.

Aim 2. What is the relation between illness perceptions (consequences, timeline, concern, and emotional response) on treatment engagement at baseline?

a) Hypothesis: Illness perceptions of greater severity will have a positive relation to medication engagement and negative relation to psychotherapy engagement.

Aim 3. Does self-stigma of seeking treatment predict treatment outcome expectancies (psychotherapy and medication) and treatment engagement at baseline?

a) Hypothesis: Higher self-stigma of taking psychiatric medication will decrease medication engagement and positive expectancies while increasing psychotherapy engagement. Conversely, self-stigma of attending psychotherapy will decrease engagement and positive expectancies of psychotherapy, and increase medication engagement.

Aim 4. What is the effect of causal models of mental illness (biological, psychosocial, biopsychosocial, and control) on perceived etiology of depression (biological, psychological, and social) from Time 1 to Time 2?

a) Hypothesis: From Time 1 to Time 2, the biological causal model explanation will increase endorsement of biological causes in comparison to psychosocial causal model explanation and control condition. However, the biological causal model explanation will decrease endorsement of social and psychological causes in comparison to control condition, and psychosocial and biopsychosocial causal model explanations.

b) Hypothesis: From Time 1 to Time 2, the psychosocial causal model explanation will increase endorsement of psychological and social causes in comparison to biological explanations and control condition. However, the psychosocial causal model explanation will decrease endorsement of biological causes in comparison to the control condition, and biological and biopsychosocial causal model explanations.

c) Hypothesis: From Time 1 to Time 2, the biopsychosocial causal model explanation will increase endorsement of psychological and social causes in comparison to the biological causal model explanation condition and control condition. Also, the biopsychosocial causal model explanation will increase biological causes in comparison to the psychosocial causal model explanation and the control condition.

d) Hypothesis: From Time 1 to Time 2, the control condition will not change endorsement of psychological, social, and biological causes in comparison to biological, psychosocial, and biopsychosocial explanations.

Aim 5. What is the effect of causal models of mental illness (biological, psychosocial, biopsychosocial, and control) on treatment engagement (i.e., self-reported perceived likelihood of engaging in psychotherapy and/or medication) from Time 1 to Time 2?

a) Hypothesis: From Time 1 to Time 2, the biological causal model explanation will increase medication engagement in comparison to psychosocial causal model explanation and control condition. However, the biological causal model explanation will decrease psychotherapy engagement in comparison to control condition, and psychosocial and biopsychosocial causal model explanations.

b) Hypothesis: From Time 1 to Time 2, the psychosocial causal model explanation will increase psychotherapy engagement in comparison to biological explanations and control condition. However, the psychosocial causal model explanation will decrease medication engagement in comparison to the control condition, and biological and biopsychosocial causal model explanations.

c) Hypothesis: From Time 1 to Time 2, the biopsychosocial causal model explanation will increase psychotherapy engagement in comparison to the biological causal model explanation condition and control condition. Also, the biopsychosocial causal model explanation will increase medication engagement in comparison to psychosocial causal model explanation and the control condition.

d) Hypothesis: From Time 1 to Time 2, the control condition will not change medication and psychotherapy engagement comparison to biological, psychosocial, and biopsychosocial explanations.

Aim 6. What is the effect of causal models of mental illness (biological, psychosocial, biopsychosocial, and control) on treatment outcome expectancies (i.e., medication and psychotherapy) from Time 1 to Time 2?

a) Hypothesis: From Time 1 to Time 2, the biological causal model explanation will increase positive outcome expectancies of medication in comparison to psychosocial causal model explanation and control condition. However, the biological causal model explanation will decrease positive outcome expectancies of psychotherapy in comparison to control condition, and psychosocial and biopsychosocial causal model explanations.

b) Hypothesis: From Time 1 to Time 2, the psychosocial causal model explanation will increase positive outcome expectancies of psychotherapy in comparison to biological explanations and control conditions. However, the psychosocial causal model explanation will decrease positive outcome expectancies of medications in comparison to the control condition, and biological and biopsychosocial causal model explanations.

c) Hypothesis: From Time 1 to Time 2, the biopsychosocial causal model explanation will increase positive outcome expectancies of psychotherapy in comparison to the biological causal model explanation condition and control condition. Also, the biopsychosocial causal model explanation will increase positive outcome expectancies of medications in comparison to psychosocial causal model explanation and the control condition.

d) Hypothesis: From Time 1 to Time 2, the control condition will not change positive outcome expectancies of medication and psychotherapy in comparison to biological, psychosocial, and biopsychosocial explanations.

Aim 7. What is the effect of causal models of mental illness (biological, psychosocial, biopsychosocial, and control) on self-stigma of seeking treatment (i.e., medication and psychotherapy)?

a) Hypothesis: From Time 1 to Time 2, the biological causal model explanation will decrease self-stigma of seeking medication in comparison to psychosocial causal model explanation and control condition. However, the biological causal model explanation will increase self-stigma of seeking of psychotherapy in comparison to control condition, and psychosocial and biopsychosocial causal model explanations.

b) Hypothesis: From Time 1 to Time 2, the psychosocial causal model explanation will decrease self-stigma of seeking psychotherapy in comparison to biological explanations and control conditions. However, the psychosocial causal model explanation will increase self-stigma of seeking medications in comparison to the control condition, and biological and biopsychosocial causal model explanations.

c) Hypothesis: From Time 1 to Time 2, the biopsychosocial causal model explanation will decrease self-stigma of seeking psychotherapy in comparison to the biological causal model explanation condition and control condition. Also, the biopsychosocial causal model explanation will decrease self-stigma of seeking medications in comparison to psychosocial causal model explanation and the control condition.

d) Hypothesis: From Time 1 to Time 2, the control condition will not change self-stigma of seeking medication and psychotherapy in comparison to biological, psychosocial, and biopsychosocial explanations.

Aim 8. What are the effects of treatment education on treatment outcome expectancies (psychotherapy and medication), self-stigma of seeking for seeking treatment (psychotherapy and medication), and attitudes towards treatment engagement (i.e., self-reported likelihood of engaging in psychotherapy, medication, or psychotherapy and medication) between causal model explanations between Time 2 and Time 3?

a) Hypothesis: From Time 2 and Time 3, treatment education (psychotherapy and medication) will reduce between-group differences between biological, psychosocial, biopsychosocial, and control condition in regards to self-stigma of seeking, treatment engagement, and treatment outcome expectancies.

CHAPTER 3

METHODOLOGY

Participants

A total of 736 participants were collected from Reddit, Craigslist, Mturk, and the UMass Boston student pool. After checking for fraudulent and international cases, 305 cases were removed resulting in 431 total cases. Of the 305 cases, 70 were participants from outside the United States,. These cases were removed, because the study sought to evaluate the effects of information regarding mental illness messages within the United States. Fraudulent cases (n = 235) were identified using by completion time of the survey (if it took less than 30 minutes to complete the typically 30- to 45-minute survey); participant's responses to check screening questions, such as "enter the word Red" and "choose number three"; and duplicate IP addresses. Of the 431 cases used in the study, 20 were found to have data missing at random. The data was imputed utilizing Expectation Maximization technique resulting in 431 complete cases. There was a balanced distribution of participants into each condition. the biological explanations (n = 111, 25.8%), psychosocial explanations (n =107, 24.8%), biopsychosocial explanations (n = 105, 24.4%), and control (n = 108, 25.1%) conditions.

The average age of the sample was 29 years old with a range of 18 to 74. The sample was made up of 57% female (n = 247) and 42.5% male (n = 183), and one participant identified as intersex (.2%). Participants endorsed a broad range of sexual orientations which included heterosexual (n = 289, 67.1%), gay (n = 16, 3.7%), lesbian (n = 9, 2.1%), bisexual (n = 57, 13.2%), queer (n = 10, 2.3%), questioning (n = 16, 3.7%), asexual (n = 29, 6.7%), and pansexual (n = 3, .7%) Moreover, the sample included a diverse group of participants in relation to race and ethnicity. The groups endorsed included Alaskan Native/Native American/Indigenous (n = 4, .9%), Latino (n = 41, 9.5%), Asia (n = 41, 9%), Pacific Islander/Native Hawaiian (n = 3, .7%), White (n = 289, 67.1%), Black/African American (n = 31, 7.2%), Multiracial (n = 15, 3.5%), and Other (n = 7, 1.6%).

Highest levels of education obtained was comprised of some high school (n = 12, 2.8%), high school graduate/GED (n = 56, 13.0%), some college (n = 161, 37.4%), Associate's degree (n = 49, 11.4%), Bachelor's degree (n = 109, 25.3%), Master's degree (n = 39, 9.0%), and Doctoral/ Professional degree (n = 5, 1.2%). In regards to income, participants reported that they made under $10,000 (n = 31, 7.2%), $10,001-$20,000 (n = 31, 7.2%), $20,001-$30,000 (n = 43, 10.0%), $30,001-$40,000 (n = 38, 8.8%), $40,001-$50,000 (n = 59, 13.7%), $50,001-$65,000 (n = 37, 8.6%), $60,001-$75,000 (n = 48, 11.1%), $70,001-$80,000 (n = 23, 5.3%), $80,001-$100,000 (n = 31, 7.2%), over $100,000 (n = 34, 7.9%), and Unsure/Prefer not to answer (n =56, 13.0%). The overall sample could be described as diverse in regards to age, gender, income, and education (see Table 1). However, it is important to note that a majority of the sample was White.

A total of 192 (45%) participants were currently or in the past diagnosed with depression. The remaining 245 (55%) participants responded never receiving a diagnosis of depression. Participants who had a diagnosis of depression and those who did not were evenly distributed across experimental condition (for cross tabulation see Table 2). Moreover, 198 (46%) participants reported attending psychotherapy currently or in the past. The remaining 232 (54%) reported never attending psychotherapy. Both, participants who attended and did not attend psychotherapy, were evenly distributed across experimental condition (for cross tabulation see Table 3).

Table 1.
Demographics of Sample

Demographic Variable	n	%
Participant per Conditions		
Biological	111	25.8
Psychosocial	107	24.8
Biopsychosocial	105	24.4
Control	108	25.1
Sex		
Female	247	57
Male	183	42.5
Intersex	1	.2
Sexual Orientation		
Heterosexual	289	67.1
Gay	16	3.7
Lesbian	9	2.1
Bisexual	56	13.2
Queer	10	2.3
Questioning	16	3.7
Asexual	29	6.7
Pansexual	3	.7
Race/Ethnicity		
Native American/Indigenous	4	.9
Latino	41	9.5
Asian	41	9
Pacific Islander	3	.7
White	289	67.1
Black/African American	31	7.2
Multicultural	15	3.5
Level of Education		
Some high school	12	2.8
High School graduate/GED	56	13
Some College	161	37.4
Associate's degree	49	11.4
Bachelor's degree	109	25.3
Master's degree	39	9.0
Doctoral/Professional degree	5	1.2
Income		
Under $10,000	31	7.2
$10,001 - $20,000	31	7.2
$20,001 - $30,000	43	10
$30,001 - $40,000	38	8.8
$40,001 - $50,000	59	13.7

$50,001 - $60,000	37	8.6
$60,001 - $70,000	48	11.1
$70,001 - $80,000	23	5.3
$80,001 - $100,000	31	7.2
Over $100,001	34	7.9
Unsure/Prefer not to answer	56	12

Table 2.
Cross tabulation for being or having been diagnosed with depression by experimental condition

Are you or have you been diagnosed with depression by mental health or medical professional?	Biological Explanation	Psychosocial Explanation	Biopsychosocial Explanation	Control Condition	Total
Yes	52 (27%)	41 (21%)	47 (25%)	52 (27%)	192 (45%)
No	59 (25%)	65 (28%)	56 (24%)	55 (23%)	235 (55%)
Total	111	106	103	107	431

Table 3.
Cross tabulation for ever having attended psychotherapy by experimental condition

Have you ever attended psychotherapy?	Biological Explanation	Psychosocial Explanation	Biopsychosocial Explanation	Control Condition	Total
Yes	50 (25%)	58 (29%)	44 (22%)	46 (23%)	198 (46%)
No	61 (26%)	49 (21%)	61 (26%)	61 (26%)	232 (54%)
Total	111	106	103	107	431

Procedures

Participants were presented with a demographic questionnaire. Then, participants were presented with a vignette of a character experiencing depression at Baseline (Time 1), and asked to respond the illness perception questionnaire. The illness perceptions questionnaire included consequences of the illness (consequences), timeline or duration of the illness (duration), perceived personal control over the condition (control), concern over the illness (concern), and emotional responses to the illness (emotional). In addition, participants were asked to complete measures self-stigma for seeking help, outcome

expectancies, and engagement questionnaires related to attending psychotherapy and taking psychiatric medications as well as the perceived causal models of mental illness scale.

Afterwards, participants were randomly assigned into one of four conditions of depression psychoeducation (Time 2): (1) biological, (2) psychosocial, (3) biopsychosocial, and (4) control. Each condition presented the participant with a vignette of a doctor stating that the character in the initial vignette meets diagnostic criteria for major depressive disorder. With the exception of the control condition, each condition received a corresponding causal explanation of depression. Then participants were asked to complete the self-stigma for seeking help, treatment outcome expectancies, and treatment engagement questionnaire regarding psychotherapy and medication as well perceived etiology of depression scale.

All participants were presented with a third vignette providing treatment education about both psychotherapy and medication for depression, Treatment Education (Time 3). Following the vignette, participants were asked to answer self-stigma for seeking help, outcome expectancies, and treatment engagement in psychiatric medication and psychotherapy (for flow chart of procedures see Figure 1).

Measures

Demographic information. Participants were asked for their age, sex (male, female, or intersex), gender (man, woman, genderqueer, transgender, MtF, or FtM), sexual orientation (heterosexual, gay/lesbian, bisexual, queer, other), race/ ethnicity (Latino, non-Hispanic White, African American/Black, Asian/Asian-American), level of education, income, place of birth, and years in the US.

Treatment utilization and perceived helpfulness. A set of four questions were designed for this study to assess participants' utilization of psychological and psychiatric services. Participants will be asked past and current utilization of psychotherapy and medication treatments using dichotomous (yes or no) questions. In addition, they will be asked about their perception of helpfulness for these treatments using a five-point Likert scale ranging from 1 (very unhelpful) to 5 (very helpful). Participants also will be asked using a dichotomous question, whether they have received a depression diagnosis.

Perceptions and attitudes towards mental illness. Participants' perceptions regarding the vignette character's condition was assessed using a modified version of *The Brief Illness Perceptions Questionnaire* (BIPQ; Broadbent, Petrie, Main, & Weinman, 2006). The BIPQ provides a rapid assessment of emotional and cognitive representations of illness. Each item represents one perception of the illness and these are rated from 0 to 10. Items include: consequences ('How much does your illness affect your life?'), timeline ('How long do you think your illness will continue?'), personal control ('How much control do you feel you have over your illness?'), identity ('How much do you experience symptoms from your illness?'), coherence ('How well do you feel you understand your illness?'), emotional representation ('How much does your illness affect you emotionally? Does it make you angry, scared, upset, or depressed)?' and illness concern ('How concerned are you about your illness?'). In the current study items were modified to assess the vignette's character condition rather than personal illness. For instance, 'How much does your illness affect your life?' was modified to state "If you were in Alex's situation, how much do think this experience would affect your life?" Items have been reported as psychometrically suitable for a range of illnesses

(Broadbent et al., 2006). Items 3, 4, and 7 are reverse coded—higher score on all items reflects a more negative perception.

Causal Models of Mental Illness. Participants' biopsychosocial causal models of depression were assessed using the *Perceived Etiology of Depression Scale* (PEDS; Okumura & Sakamoto, 2012). The scale measures lay beliefs about the causes and risk factors of depression. Twelve items reflect a range of possible biological ('chemical imbalance in the brain'), psychological ('poor self-esteem') and social ('family breakdown') explanations for depression. Respondents rated each question on a five-point Likert scale (0 = not a cause, 1 = rarely a cause, 2 = undecided as a cause, 3 = likely to be a cause, 4 = a cause). Scores for each subscale ranged from 0 to 16, with higher scores indicating the greater importance of a given possible explanation of depression. In addition, an open-ended question was asked to assess the extent that culture influences participant's perceived etiology of depression. The question stated, "Do you think there are aspects of your cultural background that influence your beliefs about causes of mental illnesses? If so, please explain how this influence functions?"

Treatment Outcome Expectancies. The *Credibility/Expectancy Questionnaire (CEQ) —The Expectancy Rating Scale* (ERS; Devilly & Borkovec, 2000) was used to assess participants' expectancies of psychotherapy and medication. The ERS is composed of 3-items taken from Borkovec and Nau's (1972) outcome expectancies questionnaire. One question, "How much do you really feel that therapy will help you to reduce your symptoms?" is rated on a 9-point Likert scale (not at all to very much). Two questions "By the end of psychotherapy, how much improvement do you think will occur?" and "By the end of the therapy period, how much improvement do you really feel will

occur?" are rated on a 0% to 100% scale. Three items are standardized and summed to create an expectancy subscale, measuring the degree to which the patient expects to improve from the treatment. The original questionnaire has high internal consistency (0.89 for the Credibility subscale in the current sample), test-retest reliability, and validity (Devilly & Borkovec, 2000). A duplicate set of three questions were modified in the current study to assess for outcome expectancies of taking psychiatric medications.

Treatment Engagement. The likelihood of engaging in treatment was assessed by asking participants, "If you were in Alex's situation, how likely would you engage in the following treatments." The question was developed for the current study and it applies to three forms of treatment: psychotherapy (ex. psychologist, counselor, therapist), psychiatric medication (ex. antidepressants, antianxiety, etc.), and non-professional help (ex. talk to family and friends). Participants rated the likelihood of engaging in each of these treatment using a Likert scale ranging from 1 (Extremely unlikely) to 7 (Extremely likely).

Stigma. Participants self-stigma towards seeking treatment were measured using the *Self-Stigma of Seeking Help (SSOSH) Scale* (Vogel et al., 2006). The SSOSH contains 10-items that assessed using a 5-point Likert ranging from 1 (strongly disagree) to 3 (agree and disagree equally) to 5 (strongly agree). The SSOH has demonstrated good reliability (.91) and test–retest reliability (.72) along with good construct, criterion, and predictive validity across multiple studies. For the current study, only five items that are highly correlated to the total scale score were selected. The five items include: "If I went to a psychotherapy, I would be less satisfied with myself" (r = .832); "I would feel inadequate if I went to a psychotherapy for psychological help" (r = .808); "It would

make me feel inferior to ask a therapist for help" (r = .802); "I would feel worse about myself if I could not solve my own problems" (r = .771); and "Seeking psychological help would make me feel less intelligent" (r = .769). A duplicate set of these items were modified to reflect self-stigma of seeking medication treatment; for example, "I would feel inadequate if *I took psychiatric medication* for psychological help."

Vignettes. Three vignettes were presented sequentially to participants. The first vignette was used to help the participant imagine experiencing symptoms of depression. The second vignette provided participants with information regarding causes of depression and the third provides information regarding its treatments. The first vignette, presented at baseline (Time 1), was based upon a vignette developed for the Mental Health Module of the General Social Survey (GSS; 1996). The vignette depicted a fictitious character named Alex, who meets criteria for Major Depressive Disorder as outlined by the DSM-5 (APA, 2013). The vignette described Alex's depressive symptoms, but did not state that he has depression.

The second vignette, presented at Depression Psychoeducation (Time 2), showed a fictitious doctor providing to Alex a diagnosis of Major Depressive Disorder based on DSM-5 criteria and information regarding the causes of depression. There are a total of four forms of the vignette, which match the biological, psychosocial, biopsychosocial, and control condition. The third vignette depicted a fictitious doctor providing information regarding psychotherapy and medication treatment for depression. Both the diagnostic and treatment information provided by the fictitious doctor is a composite summary of information found in standard psychoeducation pamphlets and informational websites on depression from the National Institute of Mental Health

(https://www.nimh.nih.gov/health/topics/depression/index.shtml), the American Psychological Association (http://www.apa.org/topics/depress/recover.aspx), and the American Psychiatric Association (http://www.psychiatry.org/patients-families/depression/what-is-depression). A copy of all measures and vignettes used in the study can be found in Appendix II.

Data Analysis

Descriptive analyses were used in order provide information of the sample data such as age, gender, sexual orientation, and race/ethnicity. These analyses were used to screen the date for missing values and the presence of outliers. Missing data was imputed utilizing Expectation Maximization technique. Verification of assumptions included distribution of the data for kurtosis and skewness using Kolmogorov-Smirnov and Shapiro-Wilk tests. Data was checked for sphericity using Levene's test. Overall, data was found to be normally distributed.

Predictive Analytics software (PASW) Version 17 (SPSS) was used to run all analyses for this study. Pearson's *r* correlations were used to assess Aims 1 and 2 to explore the relation between illness perceptions (consequences, timeline, concern, and emotional response) to attending psychotherapy and taking psychiatric medication outcome expectancies and likelihood of engagement at baseline. A series of linear regressions were used to test the predictive power of self-stigma for attending psychotherapy and taking psychiatric medication on engagement and outcome expectancies treatment.

Multiple repeated measures analysis of variance (RM-ANOVA) were used to assess Aims 5 through 7. First, a 4 × 2 RM-ANOVA was used to observe between-group

differences (explanatory models of mental illness) as well as within group difference (baseline and depression psychoeducation) in regards to perceived etiological causes of depression, treatment engagement, outcome expectancies, and self-stigma of seeking treatment. In order to test the hypothesis within each of these aims, post-hoc tests and contrast were used to observe time and groups differences regarding the outcome variables.

A second 4 × 2 RM-ANOVA was used to asses Aim 8, that group difference present in Time 2 (regarding self-stigma of seeking treatment, and engagement and outcome expectancies of psychotherapy) will not be significant in Time 3. Multiple two one-sided t-tests were used to assess equivalence between-groups at Time 3. The equivalence tests assess whether mean differences fall into a confidence interval predefined as theoretically representing equivalence (Walker & Nowacki, 2010). Given the paucity of research in the area, a threshold of 10% different was utilized. Scores that did not have a difference equal or smaller than 10% were considered practically equivalent. Groups were considered equivalent, when both t-tests demonstrated that the mean difference differed significantly from the threshold.

Dependent variables in the current study were tested to verify that they met the assumptions of RM-ANOVA. There were not any univariate outliers in the data, assessed by inspection of a boxplot for values greater than 1.5 box-lengths from the edge of the box. There were not any multivariate outliers in the data as assessed using Mahalanobis distance with a critical values of ± 3. Moreover, the homogeneity of covariances was as assessed using Box's test of equality of covariance matrices ($p = .90$). Levene's test of homogeneity of variance ($p > .05$). showed that there was homogeneity of variances.

Dependent variables were not skewed with the exception of biological etiological beliefs of depression, which was found to be negatively skewed at baseline (Time 1) and depression psychoeducation (Time 2). This variable was transformed utilizing X^2 transformation. Analyses were run with transformed and non-transformed variable and yielded same results. Statistical analyses presented in the results section used the non-transformed variable. Pillai's criterion was used in RM-ANOVA, because it is considered a more robust test for unequal covariance matrices (Olsen, 1976).

CHAPTER 4

RESULTS

The rest of the section is structured so that sub-section provides the results for each aims as set forth in the Aims Section. First, baselines statistic of all outcome variables are presented under its own sub-section. Second, the results section presents a set of exploratory aims, which include correlations of illness perception variables to treatment engagement and outcome expectancies. In addition, exploratory aims include assessing the predictive power of self-stigma for attending psychotherapy and taking psychiatric medications on treatment engagement and outcome expectancies. Third, the result section presents the analysis of experimental aims, which include statistics for four of the outcome variables, perceived etiologies of depression (biological, psychological, and social), treatment engagement (psychotherapy, psychiatric medications, and non-professional help), treatment outcome expectancies (psychotherapy and psychiatric medications), and self-stigma for seeking treatment (psychotherapy and psychiatric medications) in relation to assigned experimental condition (biological, psychosocial, and biopsychosocial explanations, and control condition) from baseline (Time 1), after depression psychoeducation (Time 2), and after treatment education (Time3).

Baseline Statistical Analysis

Statistical analyses were conducted to assess group difference among conditions on all outcome variables. Differences in perceived etiology of depression (biological, psychological, and social), treatment engagement, treatment outcome expectancies, and self-stigma for seeking treatment in relation to assigned experimental condition (biological, psychosocial, biopsychosocial, and control conditions) were observed utilizing a one-way ANOVA at baseline (Time 1). There were no significant differences among experimental conditions in relation to biological, F (3, 427) = 1.729, p = .16, social, F (3, 427) = .448, p = .72, and psychological, F (3, 427) = 2.609, p = .05, causes of depression. Similarly, there were no significant group differences in regards to likelihood of attending psychotherapy, F (3, 427) = .384, p = .76, taking psychiatric medication, F (3, 427) = .887, p = .45, and seeking non-professional help, F (3, 427) = .096, p = .96. In addition, there were not statistically significant differences among conditions in relation to positive outcome expectancies for attending psychotherapy, F (3, 427) = .046, p = .99, and taking psychiatric medications, F (3, 427) = 2.016, p = .11. While this initial analysis demonstrated that there was not a statistically significant difference in outcome variables among the experimental conditions, it is important to note that score on outcomes variables are not the same across conditions.

Aim 1. The relation between illness perceptions (consequences, timeline, concern, and emotional response) on attending psychotherapy and taking medication outcome expectancies at baseline (Time 1).

Pearson r correlations were used to assess the relation between illness perceptions (consequences, timeline, personal control, emotional representation, and concern) on

psychotherapy and medication outcome expectancies at baseline (Time 1). It was hypothesized that there would be a positive relation between illness perceptions and positive expectancies of taking psychiatric medications, and a negative relation between illness perception and positive expectancies of attending psychotherapy. First, endorsing that depression would affect a person's life had a statistically significant weak positive association with positive outcome expectancies of taking psychiatric medication (r = .169, p = .01). Second, endorsing that depression would continue had a statistically significant weak positive association with positive outcome expectancies of taking psychiatric medication (r = .129, p = .01). Third, endorsing having more control over the depression had a statistically significant weak positive association with positive outcome expectancies of attending psychotherapy (r = .241, p = .01). Fourth, being concerned about depression had a statistically significant weak positive association with positive expectancies of taking psychiatric medication (r = .253, p = .01) and attending psychotherapy (r = .184, p = .01). Fifth, thinking that the experience of depression would affect you emotionally has a statistically significant weak positive association with positive expectancies taking psychiatric medications (r = .137, p = .01) and attending psychotherapy (r = .138, p = .01; for correlation matrix Table 2). The results indicated that, counter to predictions, increases in multiple of illness perceptions aspects were associated with increases in optimistic expectancies of seeking treatment and of taking psychiatric medications. Increases in positive outcome expectancies towards taking psychiatric medications were related to increased concern over depression, the perception that depression would continue, and affect the person's life and emotions. Moreover, perceived control and concern over depression were related to increased positive outcome

expectancies of attending psychotherapy. Only outcome expectancies of attending psychotherapy was related to perceived greater control over depression. Overall, more illness perception variables were related to taking psychiatric medication in comparison to attending psychotherapy.

Aim 2. The relation between illness perceptions (consequences, timeline, personal control, emotional representation, and concern) on treatment engagement at baseline (Time 1).

Pearson *r* correlations were used to assess the relation between illness perceptions (consequences, timeline, personal control, emotional representation, and concern) on attending psychotherapy, taking medication, and seeking non-professional help at baseline. First, endorsing that depression would affect a person's life had a statistically significant weak positive association with attending psychotherapy ($r = .242$, $p = .01$), taking medications ($r = .286$, $p = .01$), and seeking non-professional help ($r = .110$, $p = .01$). Second, endorsing that depression would continue had a statistically significant weak positive association with attending psychotherapy ($r = .112$, $p = .01$) and taking medications ($r = .300$, $p = .01$). Third, endorsing having more control over the depression had a statistically significant weak negative association with taking psychiatric medication ($r = -.133$, $p = .01$) and a positive association with seeking non-professional help ($r = .171$, $p = .01$). Fourth, being concerned about depression had a statistically significant weak positive association with attending psychotherapy ($r = .362$, $p = .01$), taking medications ($r = .274$, $p = .01$), and seeking non-professional help ($r = .222$, $p = .01$). Fifth, thinking that the experience of depression would affect you emotionally had statistically significant weak positive association with attending psychotherapy ($r = .281$,

p = .01) and taking medications (r = .202, p = .01; for correlation matrix Table 2). The results demonstrated that increases in likelihood of seeking non-professional help were positively related to increases in endorsing control and concern over depression. Moreover, increases in likelihood of taking psychiatric medications were associated with increased concern about depression, and that depression would continue, and affect a person's life and emotions. At the same time, taking psychiatric medications was associated with decreases in the perceived controllability of depression. Moreover, increases in endorsement in likelihood of attending psychotherapy were related to increases in being concerned about depression, thinking that depression would continue, affect a person's life and emotions, and that person has control over depression.

Table 4.

Correlation of Illness Perception and Treatment Outcome Expectancies

	1	2	3	4	5	6	7	8	9
Consequence	-								
Timeline	.500**	-							
Personal Control	-.271**	-.323**	-						
Illness concern	.602**	.412**	-.105*	-					
Emotional representation	.658**	.442**	-.221**	.653**	-				
Likelihood of attending psychotherapy	.242**	.113*	.061	.362**	.281**	-			
Likelihood of taking psychiatric medications	.286**	.300**	-.113**	.274**	.202**	.386**	-		
Positive expectancies of attending psychotherapy	.022	-.077	.241**	.184**	.137*	.569**	.111**	-	
Positive expectancies of taking psychiatric medications	.169**	.129**	.000	.253**	.138**	.274**	.614**	.396**	-

Note: p <.05, *p* <.01

Aim 3. Self-stigma for seeking treatment predictive of treatment outcome expectancies (psychotherapy and medication) and treatment engagement (psychotherapy and medication) at baseline (Time 1).

A series of hierarchical linear regressions were utilized to assess the predictive power of self-stigma for taking psychiatric medication and attending psychotherapy on treatment outcome expectancies at baseline (Time 1). Results demonstrated that self-stigma for seeking treatment accounted for some of the variance of the treatment engagement and outcome expectancies variables.

Self-stigma for seeking treatment as predictor of positive expectancies of attending psychotherapy. The first model, which included self-stigma for attending psychotherapy on positive expectancies of psychotherapy (Model 1) was found to be statistically significant, F (1, 429) = 49.106, $p < .01$ with R^2 of 10.3% with an adjusted R^2 of 10.1%. The addition of self-stigma for taking psychiatric medications (Model 2) resulted in a statistically significant R^2 increase of .012, F(1, 428) = 5.571, $p = .02$. The full model, which includes self-stigma for attending psychotherapy and taking psychiatric medication was statistically significant, F (2, 428) = 27.600 $p < .01$, with an R^2 of 11.4% and an adjusted R^2 of 11%, see Table 3.

Table 5.
Summary of Hierarchical Regression for Types of Self-stigma as predictors of positive expectancies of psychotherapy

	Model 1			Model 2		
Variable	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Self-stigma for attending psychotherapy	-4.51	0.064	-.320**	-.584	0.085	-.415**
Self-stigma for taking psychiatric medications				.180	0.076	.143**
R^2		.103			.114	
F for change in R^2		49.106**			5.571**	

Note: $*p < .05$. $**p < .01$.

Overall, the result of hierarchical regression supports the hypothesis that less self-stigma for attending psychotherapy would increase positive expectancies of attending psychotherapy. Moreover, counter to what was predicted, less self-stigma for taking psychiatric medication predicted positive expectancies of attending psychotherapy.

Self-stigma for seeking treatment as predictor of positive expectancies of taking psychiatric medications. The first model, which included self-stigma for taking psychiatric medications on positive expectancies of psychotherapy (Model 1) was found to be statistically significant, F (1, 429) = 90.07, $p < .01$ with R^2 of 17.4% with an adjusted R^2 of 17.2%. The addition of self-stigma for attending psychotherapy (Model 2) did not result in a statistically significant R^2 change, F(1, 428) = 5.571, $p = .106$. The full model, which include self-stigma for attending psychotherapy and taking psychiatric medication was statistically significant, F (2, 428) = 46.517, $p < .01$, with an R^2 of 17.9% and an adjusted R^2 of 17.5%; see Table 4.

Table 6.
Summary of Hierarchical Regression for Types of Self-stigma as predictors of positive expectancies of taking psychiatric medication

	Model 1			Model 2		
Variable	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Self-stigma for taking psychiatric medications	-.539	.057	-.417**	-.620	.076	-.479**
Self-stigma for attending psychotherapy				.136	.084	.094
R^2		.174			.179	
F for change in R^2		90.736**			2.620**	

Note: $*p < .05$. $**p < .01$.

Overall, the result of hierarchical regression supports the hypothesis that less self-stigma for taking psychiatric medication increased positive expectancies of taking

psychiatric medications. Moreover, counter to what was predicted less self-stigma for taking attending psychotherapy was not related to attending psychotherapy.

Self-stigma for attending psychotherapy as predictor attending psychotherapy. The first model, which included self-stigma for attending psychotherapy on likelihood of attending psychotherapy (Model 1) was statistically significant, F (1, 429) = 84.424, $p < .01$ with R^2 of 16.4% with an adjusted R^2 of 16.2%. The addition of self-stigma for taking psychiatric medications (Model 2) did not result in a statistically significant R^2 change, $F(1, 428) = .702$, $p = .40$. The full model, which include self-stigma for attending psychotherapy and taking psychiatric medication was statistically significant, F (2, 428) = 42.534 $p < .01$, with an R^2 of 16.6% and an adjusted R^2 of 16.2%; see Table 5.

Table 7.
Summary of Hierarchical Regression for Types of Self-stigma as predictors of attending psychotherapy

	Model 1			Model 2		
Variable	*B*	*SE B*	*β*	*B*	*SE B*	*B*
Self-stigma for attending psychotherapy	-.204	.022	-.406**	-.221	.030	-.438**
Self-stigma for taking psychiatric medications				.022	.027	.049
R^2		.103			.114	
F for change in R^2		84.424**			.702	

Note: *$p < .05$. **$p < .01$.

Overall, the result of hierarchical regression supports the hypothesis that greater self-stigma for attending psychotherapy would decrease the likelihood of attending psychotherapy. Moreover, counter to what was predicted, there was no association between self-stigma for taking psychiatric medication and likelihood of attending psychotherapy.

Self-stigma for taking psychiatric medication as predictor for taking psychiatric medications. The first model, which included self-stigma for attending psychotherapy on positive expectancies of `psychotherapy (Model 1) was statistically significant, F (1, 429) = 21.35, p = .65 with R^2 of 5.3% with an adjusted R^2 of 5.0%. The addition of self-stigma for taking psychiatric medications (Model 2) resulted in a statistically significant R^2 increase .22, F(1, 428) = .130.28, p < .01. The full model, which include self-stigma for attending psychotherapy and taking psychiatric medication was statistically significant, F (2, 428) = 80.661 p < .01, with an R^2 of 27.4% and an adjusted R^2 of 27%; see Table 6.

Table 8.
Summary of Hierarchical Regression for Types of Self-stigma as predictors of taking psychiatric medication

	Model 1			Model 2		
Variable	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Self-stigma for attending psychotherapy	-.133	.027	-.230**	.107	.032	.184**
Self-stigma for taking psychiatric medications				-.326	.029	-.626**
R^2		.053			.274	
F for change in R^2		23.857**			130.276**	

Note: *p < .05. **p < .01.

Overall, the result of hierarchical regression show that more self-stigma for attending psychotherapy predicted increase in taking medication. Moreover, as predicted less self-stigma for taking psychiatric medication predicted greater likelihood of taking psychiatric medications.

Aim 4. Effect of causal models of mental illness (biological, psychosocial, biopsychosocial, and control) on perceived etiology of depression (biological, psychological, and social) from baseline (Time 1) to depression psychoeducation (Time 2).

A RM-ANOVA was used to assess the difference among four conditions (biological, psychosocial, biopsychosocial, and control condition) on perceived etiology of depression, which include biological, social, and psychological causes between baseline (Time 1) and after depression psychoeducation (Time 2). It was hypothesized that perceived etiological causes of depression would be more highly endorsed within the condition that provided education on that specific cause. For example, endorsement of biological causes was expected to increase in the biological condition. In addition, it was expected that there would be a decrease in the endorsement of causes that were unrelated to the specific condition in comparison to the other conditions. For example, psychological causes might increase in the psychosocial condition, but would decrease in the biological condition. Also, it was predicted that control condition would have no changes in the three perceived etiological causes of depression in comparison to other groups. Results demonstrated that there was a statistically significant interaction effect between baseline (Time 1) and after depression psychoeducation (Time 2) by condition, $F(9, 1281) = 5.561$, $p < .01$, Pillai's Trace = .113, partial, $\eta^2 = .038$, and this held true for social causes of depression, $F(3, 427) = 10.024$, $p < .01$, partial $\eta^2 = .066$, and psychological causes of depression, $F(3, 427) = 4.51$, $p < .01$, partial $\eta^2 = .031$.

A follow-up repeated measures ANOVA was used to observe the main effects of time for each condition. There was a statistically significant effect of time within the

biological explanation condition on biological causes, $F(1, 110) = 5.694$, $p = .019$, partial $\eta^2 = .049$, psychological causes, $F(1, 110) = 9.294$, $p < .01$, partial $\eta^2 = .078$, and social causes, $F(1, 110) = 12.099$, $p < .01$, partial $\eta^2 = .099$. Within the biological explanation condition, endorsement of biological causes was greater after depression psychoeducation was presented ($M = 17.154$, $SE = 7.19$, $p = .02$). In addition, after depression psychoeducation (Time 2) there was a lower endorsement of psychological causes ($M = –1.067$, $SE = .350$, $p < .01$) and social causes ($M = –1.154$, $SE = .335$, $p < .01$) in comparison to baseline (Time 1). These results supported the hypothesis that biological explanations will increase endorsement of biological causes and decrease social and psychological causes of depression.

Moreover, there was only a statistically significant increase in the endorsement of social causes ($M = .877$, $SE = .238$, $p < .01$) between baseline (Time 1) and after depression psychoeducation (Time 2) for the psychosocial explanation condition, $F(1, 106) = 41.138$, $p < .01$, partial $\eta^2 = .114$. There were no statistically significant changes on social, psychological, and biological causes from baseline (Time 1) and after depression psychoeducation (Time 2) in the control and biopsychosocial conditions. Counter to the hypothesis, there were no changes in the biopsychosocial condition, which was expected to increase endorsement of all perceived etiologies of depression across time. However, as predicted, there were no statistically significant changes in the control condition across time. Overall, the results found that changes between baseline and after depression psychoeducation occurred, but only within the biological or psychosocial conditions, which increased in their respective causes. The psychosocial condition only

led to increases in the endorsement of social causes and not psychosocial causes, however.

Aim 5. Effect of causal models of mental illness (biological, psychosocial, biopsychosocial, and control) on treatment engagement (psychotherapy, medication, and non-professional help) from baseline (Time 1) to depression psychoeducation (Time 2).

A RM-ANOVA was used to assess the difference among four conditions (biological, psychosocial, biopsychosocial, and control condition) across two different time points, baseline (Time 1) and after depression psychoeducation (Time 2) on likelihood of engaging in different forms of treatment. It was hypothesized that there would be increases in the endorsement of engaging in treatments related to each respective causal explanation of depression. For example, it was predicted that participants in the psychosocial condition would endorse greater likelihood of attending psychotherapy, but decrease their likelihood of taking psychiatric medication. It was predicted that these change would be greater in the psychosocial condition in comparison to other causal explanations. Results demonstrated a statistically significant interaction effect between baseline (Time 1) and after depression psychoeducation (Time 2) by condition, $F(9,1281)= 2.552$, Pillai's Trace = .053, $p < .01$, partial $\eta^2 = .018$. These results applied to the outcome variables of likelihood of attending psychotherapy, $F(3,427)= 4.046$, $p < .01$, partial $\eta^2 = .028$, and seeking non-professional help, $F(3,427)= 3.248$, $p < .01$, partial $\eta^2 = .025$.

A follow-up RM-ANOVA was used to observe the simple main effects of time for each condition. Counter to the hypothesized effect that biological explanations would

increase likelihood of taking psychiatric medication and decrease likelihood of attending psychotherapy, results showed that within the biological explanation condition there was only a statistically significant, $F(1, 110)= 12.038$, $p < .01$, partial $\eta^2 = .000$, decrease in the endorsement of using non-professional help ($M = –.523$, $SE = .151$, $p < .01$) between baseline (Time 1) and after depression psychoeducation (Time 2). However, these changes only occurred within the biological condition. As predicted, within the psychosocial explanation condition there was a statistically significant, $F(1, 106)= 9.505$, $p < .01$, partial $\eta^2 = .082$, increase in the likelihood of attending psychotherapy ($M = .257$, $SE = .143$, $p < .01$) between baseline (Time 1) and after depression psychoeducation (Time 2), but there were no statistically significant decreases in the likelihood of taking psychiatric medications. These changes occurred only within the psychosocial explanation condition.

Moreover, as hypothesized, within the biopsychosocial explanations there was a statistically significant, $F(1, 104)= 16.110$, $p < .01$, partial $\eta^2 = .134$, increase in the likelihood of taking psychiatric medications ($M = .495$, $SE = .123$, $p < .01$) between baseline (Time 1) and after depression psychoeducation (Time 2), but not for attending psychotherapy. Counter to the hypothesis that there will be no statistically significant changes between baseline (Time 1) and after depression psychoeducation (Time 2) regarding likelihood in treatment engagement within the control condition, there was a statistically significant, $F(1, 107)= 5.352$, $p = .02$, partial $\eta^2 = .047$, increase in the likelihood of taking psychiatric medication ($M = .315$, $SE = .136$, $p = .02$) between baseline (Time 1) and after depression psychoeducation (Time 2).

A one-way ANOVA was used to observe the simple effects of condition on each time point. The results showed that there was no statically significant group difference at baseline (Time 1) for taking psychiatric medications, $F(3, 427)= .887$, $p = .45$, partial $\eta^2 = .006$, attending psychotherapy, $F(3, 427)= .384$, $p = .76$, partial $\eta^2 = .003$, and seeking non-professional help, $F(3, 427)= .096$, $p = .96$, partial $\eta^2 = .001$. In addition, there were no statistically significant group difference after depression psychoeducation (Time 2) for taking psychiatric medications, $F(3, 427)= 1.61$, $p = .19$, partial $\eta^2 = .011$, attending psychotherapy, $F(3, 427)= 2.171$, $p = .91$, partial $\eta^2 = .015$, and seeking non-professional help, $F(3, 427)= 1.81$, $p = .14$, partial $\eta^2 = .013$. The results suggest that there were no conditions that resulted in change that was greater in one condition than the other. However, there were statistically significant changes from Time 1 to Time 2 within some causal explanations. The biological condition resulted in decreases in the likelihood of seeking non-professional help, the psychosocial condition had an increase in likelihood of attending psychotherapy, the control and biopsychosocial conditions had increases in taking psychiatric medications.

Aim 6. Effect of causal models of mental illness (biological, psychosocial, biopsychosocial, and control) on treatment outcome expectancies (i.e., medication and psychotherapy) from baseline (Time 1) to depression psychoeducation (Time 2).

A RM-ANOVA was used to assess the difference among four conditions (biological, psychosocial, biopsychosocial, and control condition) between baseline (Time 1) and after receiving depression psychoeducation (Time 2) on positive outcome expectancies related to attending psychotherapy and taking psychiatric medications. It was hypothesized that there would be increases in types positive outcome expectancies

within forms of depression psychoeducation that corresponded to that form of treatment. For example, biological explanation condition will lead to decreases in self-stigma for taking psychiatric medications. Interaction effect between baseline (Time 1) and after depression psychoeducation (Time 2) by condition was found to be statistically significant, $F(6,854)= 4.254$, Pillai's Trace = .058, $p < .01$, partial $\eta^2 = .029$. This held true only for positive expectancies of psychotherapy, $F(3,427)= 7.528$, $p < .01$, partial $\eta^2 = .05$.

A follow-up RM-ANOVA was used to observe the simple main effects of time for each condition. Counter to the hypothesized effect, there were no statistically significant changes in positive expectancies of attending psychotherapy, $F(1,106)= .014$, $p = .905$, partial $\eta^2 = .000$, or taking psychiatric medications, $F(1,106)= 12.321$, $p = .10$, partial $\eta^2 = .025$, within the biological explanation. Also, counter to the hypothesis, there was a statically significant increase in positive expectancies of attending psychotherapy, $F(1,106)= 5.516$, $p = .02$, partial $\eta^2 = .049$, but not for taking psychiatric medications, $F(1,106)= 4.067$, $p = .25$, partial $\eta^2 = .012$, in the control condition.

In contrast, there was a statistically significant increase in the psychosocial condition between baseline (Time 1) and after depression psychoeducation (Time 2) in the endorsement of positive expectancies of attending psychotherapy ($M = 1.143$, $SE = .341$), $F(1,106)= 11.236$, $p < .01$, partial $\eta^2 = .096$, and taking psychiatric medication ($M = .454$, $SE = .217$), $F(1,106)= 4.37$, $p = .04$, partial $\eta^2 = .04$. Also, there was statistically significant increase in the biopsychosocial condition for the endorsement of positive expectancies of attending psychotherapy ($M = .579$, $SE = .250$), $F(1,104)= 5.361$, $p = .02$, partial $\eta^2 = .049$. A one-way ANOVA was used to observe the simple effects of

condition on each time point. There was no statistically significant difference between groups at baseline (Time 1) and after depression psychoeducation (Time 2) for positive expectancies of attending psychotherapy, $F(3,427)= .797$, $p = .50$, partial $\eta^2 = .006$, and taking psychiatric medications, $F(3,427)= .216$, $p = .886$, partial $\eta^2 = .002$. Overall, the results suggested that psychoeducation of depression did affect treatment outcome expectancies. In particular, there were increases in positive outcome expectancies in the control, biopsychosocial, and psychosocial conditions for attending psychotherapy. The psychosocial condition was the only condition to lead to increased endorsement of positive outcome expectancies of psychiatric medications.

Aim 7. Effect of causal models of mental illness (biological, psychosocial, biopsychosocial, and control) on self-stigma of seeking treatment (i.e., medication and psychotherapy).

A RM-ANOVA was used to assess the difference between four conditions (biological, psychosocial, biopsychosocial, and control condition) across baseline (Time 1) and after receiving depression psychoeducation (Time 2) on self-stigma related to attending psychotherapy or taking psychiatric medications. It was predicted that each self-stigma would decrease within each respective causal explanation conditions. For example, self-stigma for taking psychiatric medications would decrease in the biological condition, but increase in the psychosocial condition. Results demonstrated that interaction effects of time and condition, $F(6,854)= .730$, $p = .63$, Pillai's Trace = .010, partial $\eta^2 = .01$, were not statistically significant. The findings suggest that particular explanatory models of depression do not have a unique effect on reducing or increasing self-stigma for seeking treatment.

There were statistically main effects of time for Time, $F(2,426)= 23.715$, $p < .01$, Pillai's Trace= .100, partial $\eta^2 = .100$. This was true for self-stigma for attending psychotherapy, $F(1,427)= 24.983$, $p < .01$, partial $\eta^2 = .055$, and self-stigma for taking psychiatric medications, $F(1,427)= 40.385$, $p < .01$, partial $\eta^2 = .086$. Moreover, there were no statistically significant group differences for self-stigma for attending psychotherapy, $F(3,427)= .547$, $p = .815$, partial $\eta^2 = .001$, and self-stigma for taking psychiatric medications, $F(3,427)= .314$, $p = .651$, partial $\eta^2 = .002$. Overall, counter to the hypothesized effect, self-stigma for taking psychiatric medications and self-stigma for psychiatric medications appears to across time. These findings demonstrated that different psychoeducation on causes of depression did not affect self-stigma, but rather the exposure to information results in reduction of self-stigma for seeking treatment.

Table 9.

Repeated Measures ANOVA for Effect of Depression Psychoeducation on Perceived Etiology, and Treatment Engagement, Outcome Expectancies, and Self-Stigma

		Biological		Psychosocial		Biopsychosocial		Control				
Outcome variable	*N*	Time 1 *M* (SD)	Time 2 *M* (SD)	Time 1 *M* (SD)	Time 2 *M* (SD)	Time 1 *M* (SD)	Time 2 *M* (SD)	Time 1 *M* (SD)	Time 2 *M* (SD)	ANOVA results	Effect size	Pillai's Trace
Time x Condition	431									*F*=5.561, *p* < .01	.038	.113
Biological causes		14.58 (3.47)	15.26 (2.98)	14.81 (3.38)	15.32 (2.98)	14.84 (3.23)	15.30 (2.89)	13.89 (3.83)	14.13 (3.54)	*F*= 5.69, *p* = .02, df = 3**	.004	
Psychological causes		13.44 (2.82)	12.38 (3.72)	13.81 (3.11)	14.07 (2.98)	13.28 (3.34)	13.40 (3.17)	12.60 (3.68)	12.73 (3.81)	*F*= 4.51, *p*< .01, df = 3**	.038	
Social causes		14.21 (2.99)	13.05 (3.75)	14.23 (2.65)	15.11 (2.71)	14.16 (3.21)	14.58 (2.90)	13.81 (3.30)	13.75 (3.28)	*F*= 10.02, *p*< .01, df = 3**	.066	
Time x Condition	431									*F*=2.552, *p* < .05, df = 9	.018	.053
Attending psychotherapy		5.00 (1.6)	4.78 (1.7)	4.84 (1.9)	5.28 (1.5)	5.08 (1.6)	5.20 (1.6)	5.01 (1.62)	5.22 (1.7)	*F*=4.06, *p* <.01, df = 3**	.007	
Taking psychiatric medications		4.65 (1.9)	4.84 (2.0)	4.37 (2.0)	4.63 (1.8)	4.61 (1.8)	5.10 (1.7)	4.31 (2.0)	4.62 (1.9)	*F*=.993, *p* =.396, df = 3	.028	
Seeking non-professional help		5.07 (1.6)	4.55 (1.7)	5.0 (1.8)	5.0 (1.7)	5.07 (1.7)	5.03 (1.6)	5.06 (1.8)	4.92 (1.7)	*F*=3.710, *p* =.01, df = 3**	.025	
Time x Condition	431									*F*=1.833, *p* =.01, df = 18	.018	.076
Positive expectancies of attending psychotherapy		16.10 (4.29)	16.07 (4.45)	15.96 (4.88)	17.11 (4.80)	16.10 (4.41)	16.64 (5.01)	17.29 (4.80)	16.68 (4.69)	*F*= 7.52, *p*< .01, df= 3**	.050	
Positive expectancies of taking psychiatric medications		16.07 (4.46)	17.16 (4.79)	16.30 (4.77)	16.75 (5.00)	16.30 (4.67)	16.65 (5.03)	16.89 (5.19)	16..62 (4.98)	*F*= 2.175, p= .09, df= 3**	.015	
Time x Condition	431									*F*= .730, *p* = .63, df = 3		
Self-stigma for attending psychotherapy		6.75 (3.13)	6.41 (3.18)	6.69 (3.17)	6.04 (3.11)	6.59 (3.61)	5.80 (2.91)	6.63 (3.61)	6.35 (3.43)	*F*=.246, *p* =.864, df = 3	.002	
Self-stigma for taking medications		7.08 (3.59)	6.60 (3.54)	7.55 (3.70)	6.88 (3.76)	6.96 (3.52)	6.28 (3.33)	7.28 (3.87)	6.72 (3.83)	*F*=1.394 , *p* =.244, df = 3	.010	

Note: *$p < .05$. **$p < .01$.

Aim 8. Effects of treatment education on treatment outcome expectancies (psychotherapy and medication), self-stigma for seeking treatment (psychotherapy and medication), and attitudes towards treatment engagement (i.e., self-reported likelihood of engaging in psychotherapy, medication, or psychotherapy and medication) between causal model explanations between Time 2 and Time 3.

The first RM-ANOVA was used to assess the difference among four conditions (biological, psychosocial, biopsychosocial, and control condition) between depression psychoeducation (Time 2) and treatment education (Time 3) on likelihood of treatment engagement (medications, psychotherapy, and non-professional help). It was hypothesized that there would be a no group difference between from Time 2 to Time 3, and that all outcome variables would be equivalent when measured using TOST. Results show that interaction effects between depression psychoeducation (Time 2) and treatment education (Time 3) by group were not statistically significant, $F(9,1281)= .730$, $p = .57$, partial $\eta^2 = .006$. In addition, there were no statistically significant main effects group difference for likelihood of attending psychotherapy, $F(3,427)= 1.240$, $p = .30$, taking medications $F(3,427)= 1.573$, $p = .20$, or seeking non-professional help, $F(3,427)= 1.738$, $p = .16$. However, a follow-up repeated measure ANOVA showed a statistically significant increase in taking psychiatric medication ($M = .182$, $SE = .07$), $F(1,427)= 110.80$, partial $\eta^2 = .206$, $p < .01$, and decrease in seeking non-professional help ($M = -1.086$, $SE = .06$), $F(1,427)= 19.125$, $p < .01$.

A second RM-ANOVA was used to assess the difference among four conditions (biological, psychosocial, biopsychosocial, and control condition) between depression psychoeducation (Time 2) and treatment education (Time 3) on treatment outcome

expectancies for medications and psychotherapy. Interaction effects between depression psychoeducation (Time 2) and treatment education (Time 3) by group were not statistically significant, $F(6,854)= 1.610$, Pillai's Trace=.016 $p = .56$, partial $\eta^2 = .008$. In addition, there were no statistically significant main effects of group difference for positive outcome expectancies for attending psychotherapy, $F(3,427)= .438$, $p = .73$, and taking psychiatric medications $F(3,427)= .347$, $p = .79$. However, a follow-up repeated measure ANOVA showed a statistically significant increases across Time 2 to Time 3 in positive outcome expectancies of taking medication ($M = 1.341$, $SE = .128$), $F(1,427)= 110.80$, partial $\eta^2 = .206$, $p < .01$, and attending psychotherapy ($M = 1.086$, $SE = .144$), $F(1,427)= 56.88$, partial $\eta^2 = .117$, $p < .01$.

A third RM-ANOVA was used to assess the difference among four conditions (biological, psychosocial, biopsychosocial, and control condition) between receiving depression psychoeducation (Time 2) and treatment education (Time 3) on scores of self-stigma related to attending psychotherapy and taking psychiatric medication. Results demonstrated that interaction effects between depression psychoeducation (Time 2) and treatment education (Time 3) by group were not statistically significant, $F(6,854)= .819$, Pillai's Trace=.011 $p = .55$, partial $\eta^2 = .006$. In addition, there were no statistically significant main effects group difference for self-stigma for taking medications, $F(3,427)= 14.057$, $p = .570$, and self-stigma for attending psychotherapy, $F(3,427)= 11.260$, $p = .62$. However, a follow-up repeated measure ANOVA showed a statistically significant decreases in self-stigma of attending psychotherapy ($M = -.383$, $SE = .082$), $F(1,427)= 12.628$, $p < .01$, and self-stigma of taking medication ($M = -.263$, $SE = .074$), $F(1,427)= 21.781$, $p < .01$. Multiple two one-sided t-tests were used to assess that all

outcome variables were equivalent using an interval that is within 10% margin of difference. Two- One-sided T-tests showed that all conditions were within 10% margin of difference, which suggest that all variables were equivalent after treatment education (Time 3; see Table 1 for T-tests results).

Overall, the results showed that there was an increase in likelihood of taking psychiatric medication and decreased likelihood of seeking non-professional help after treatment education was provided. Also, time rather than condition accounted for increased positive outcome expectancies in attending psychotherapy and taking psychiatric medications, and decreased of self-stigma for seeking those treatments. Finally, after treatment education there were not any group difference in regards to the observed outcome variables. Also, the outcome variables were equivalent, that is, the means of the outcome variables (e.g., likelihood of attending psychotherapy, taking psychiatric medication, and seeking non-professional help; positive expectancies of attending psychotherapy and taking psychiatric medications; self-stigma for attending psychotherapy and taking psychiatric medications) were within the interval of equivalence specified.

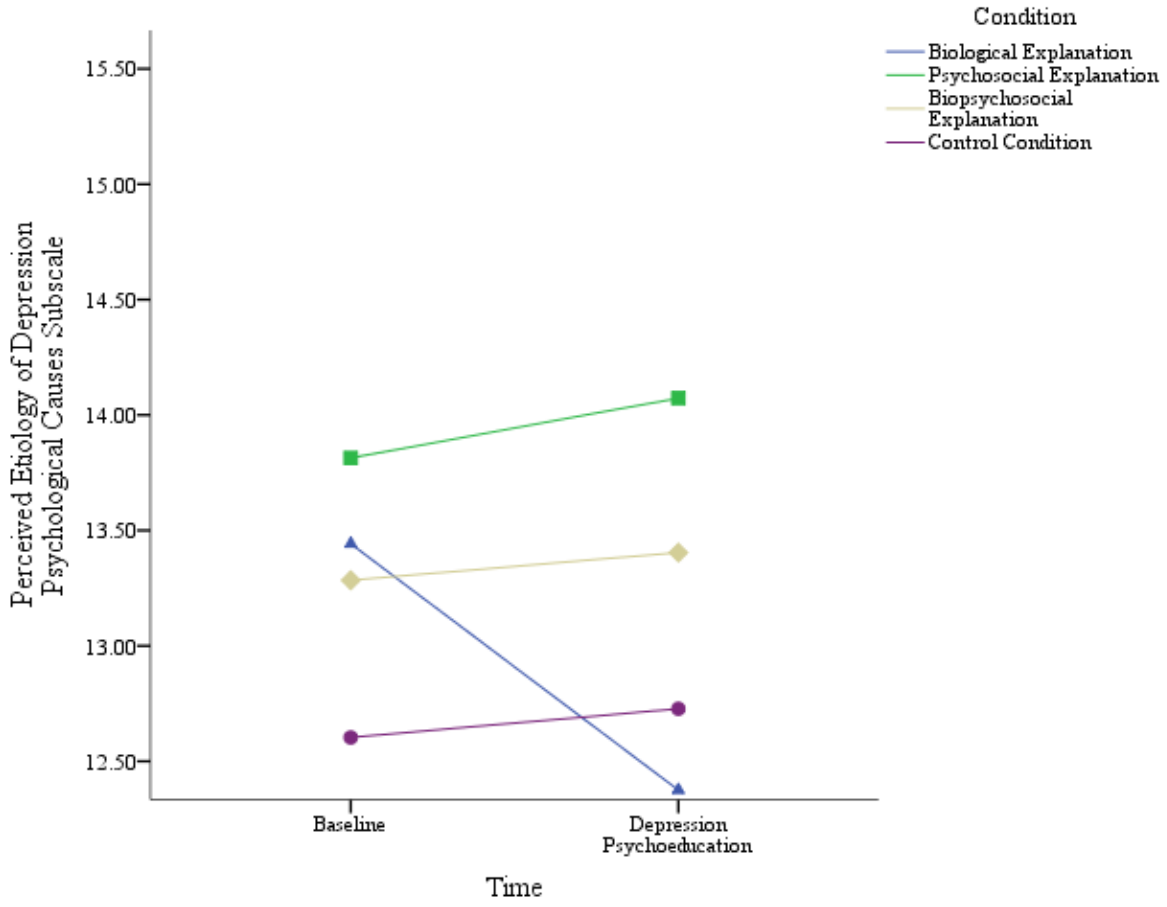


Figure 1. *Repeated measures ANOVA assessing difference between Time 1 and Time 2 among biological, psychosocial, biopsychosocial, and control condition on the psychological subscale of the perceived etiologies of depression.*

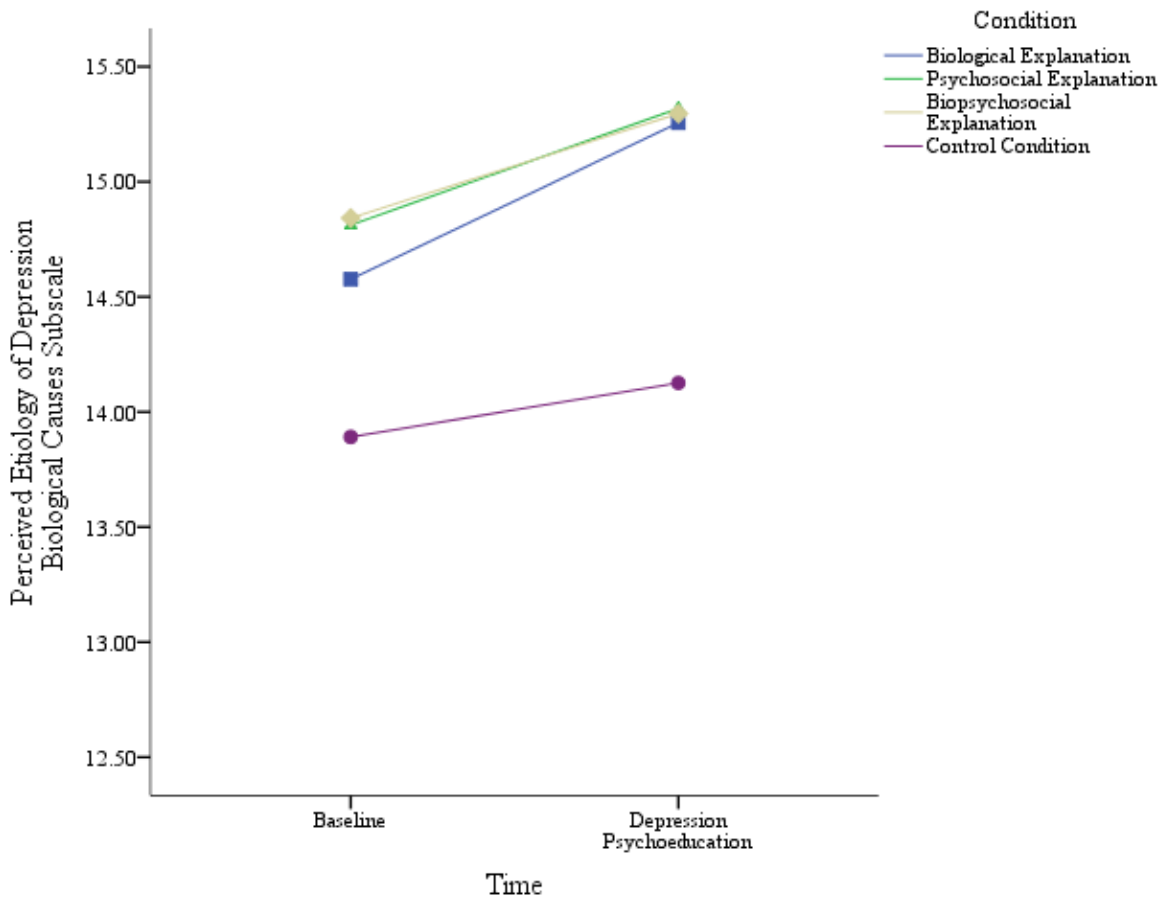


Figure 2. *Repeated measures ANOVA assessing difference between Time 1 and Time 2 among biological, psychosocial, biopsychosocial, and control condition on the biological subscale of the perceived etiologies of depression*

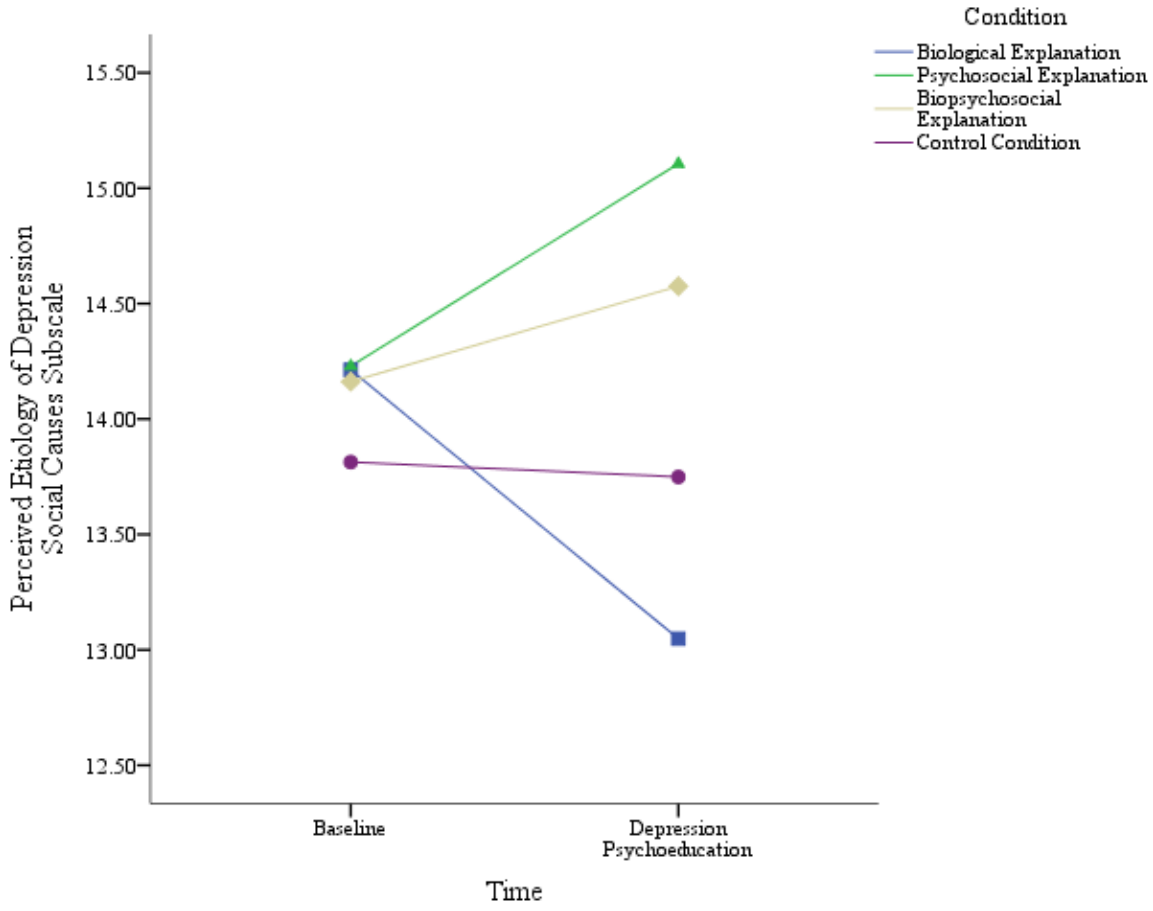


Figure 3. *Repeated measures ANOVA assessing difference between Time 1 and Time 2 among biological, psychosocial, biopsychosocial, and control condition on the social subscale of the perceived etiologies of depression*

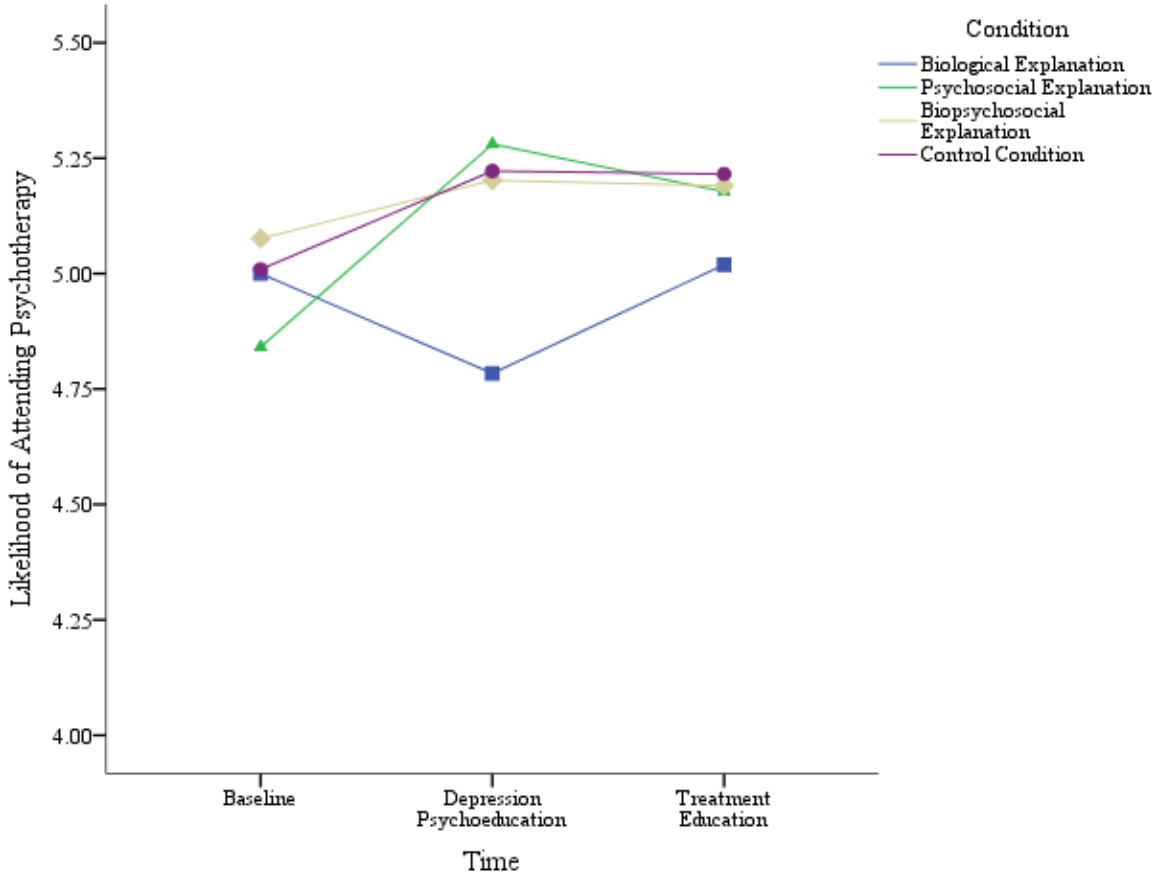


Figure 4. *Repeated measures ANOVA assessing difference between Time 1, Time 2, and Time 3 among biological, psychosocial, biopsychosocial, and control condition for endorsing likelihood attending psychotherapy.*

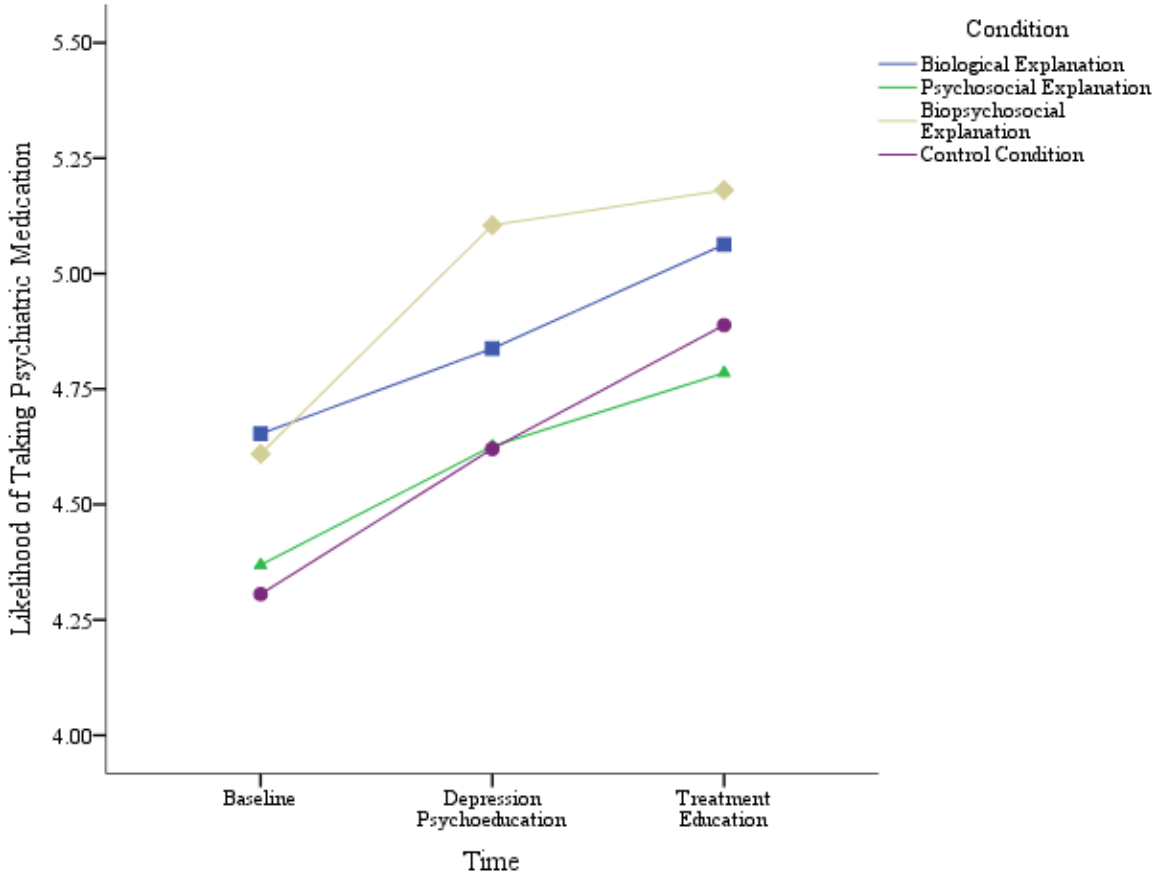


Figure 5. *Repeated measures ANOVA assessing difference between Time 1, Time 2, and Time 3 among biological, psychosocial, biopsychosocial, and control condition for endorsing likelihood of taking psychiatric medication*

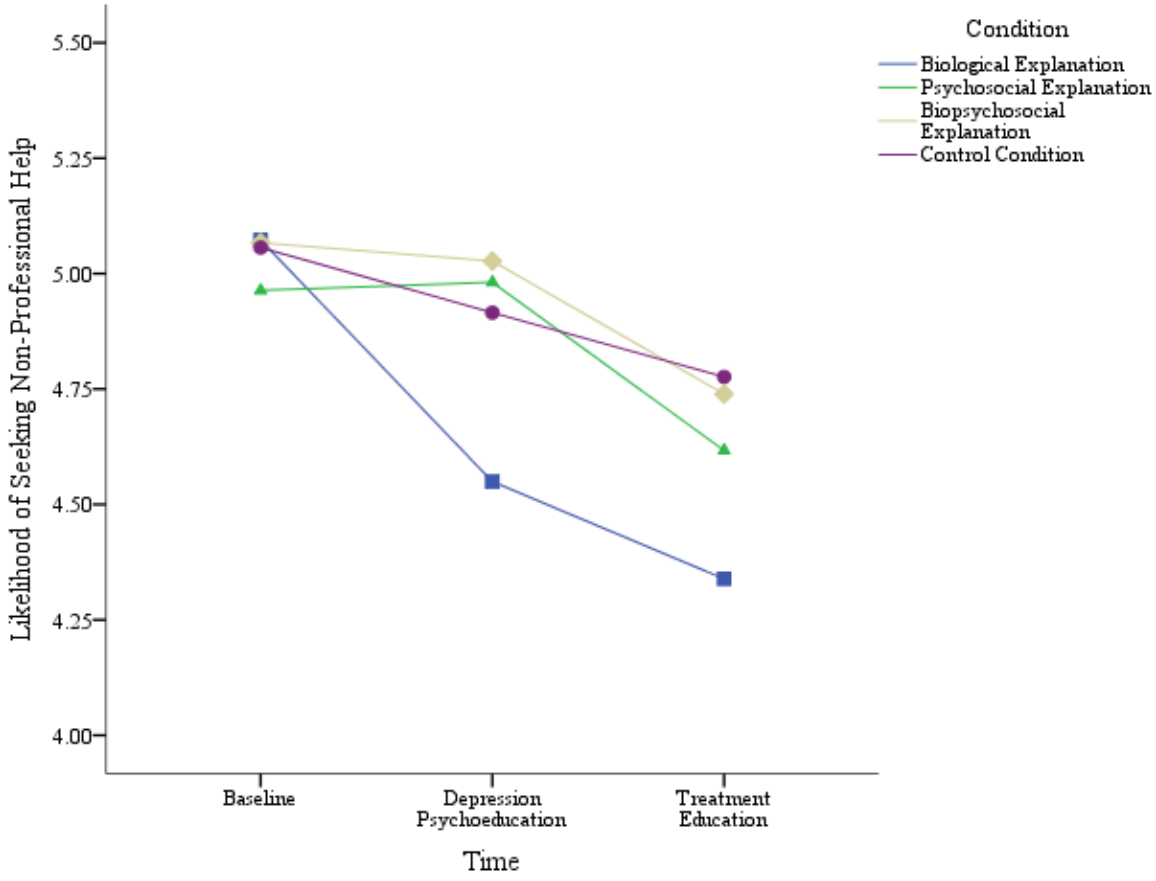


Figure 6. *Repeated measures ANOVA assessing difference between Time 1, Time 2, and Time 3 among biological, psychosocial, biopsychosocial, and control condition for likelihood of seeking non-professional help.*

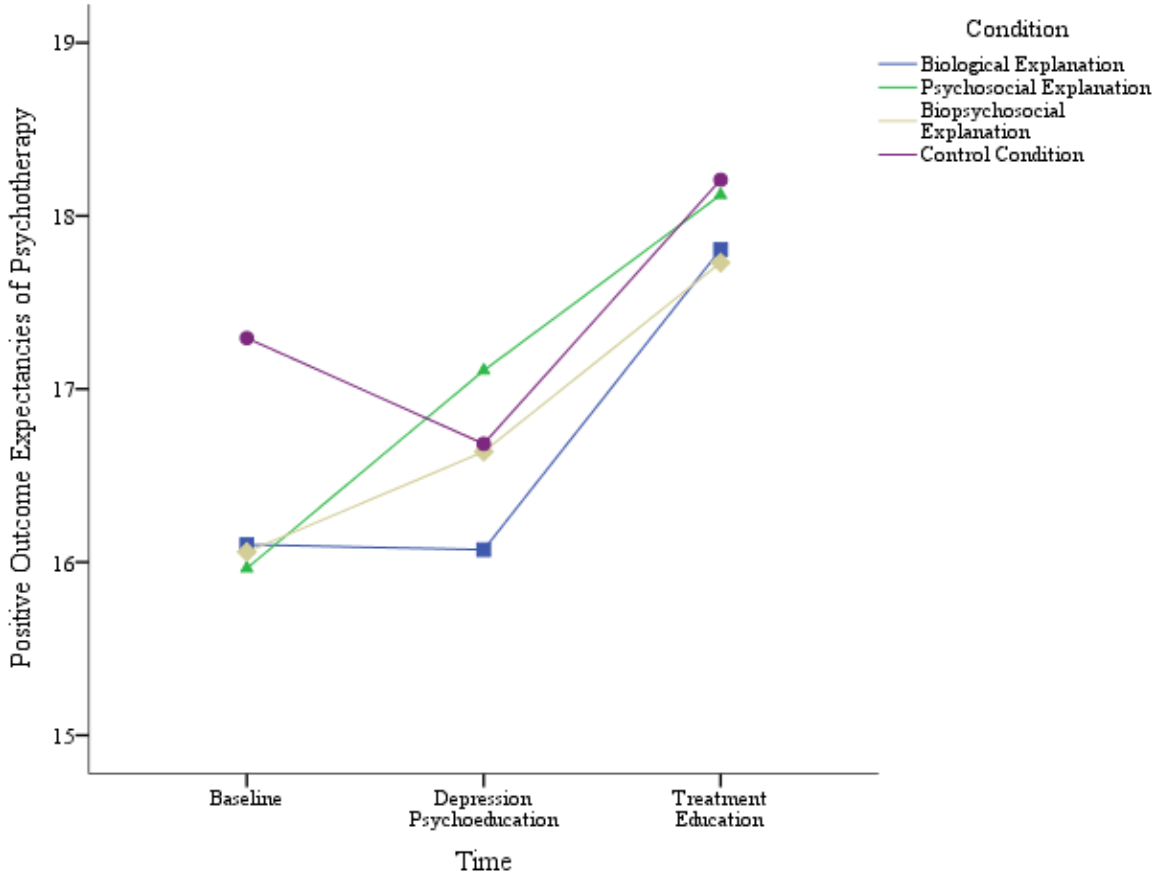


Figure 7. *Repeated measures ANOVA assessing difference between Time 1, Time 2, and Time 3 among biological, psychosocial, biopsychosocial, and control condition on positive outcome expectancies of attending psychotherapy*

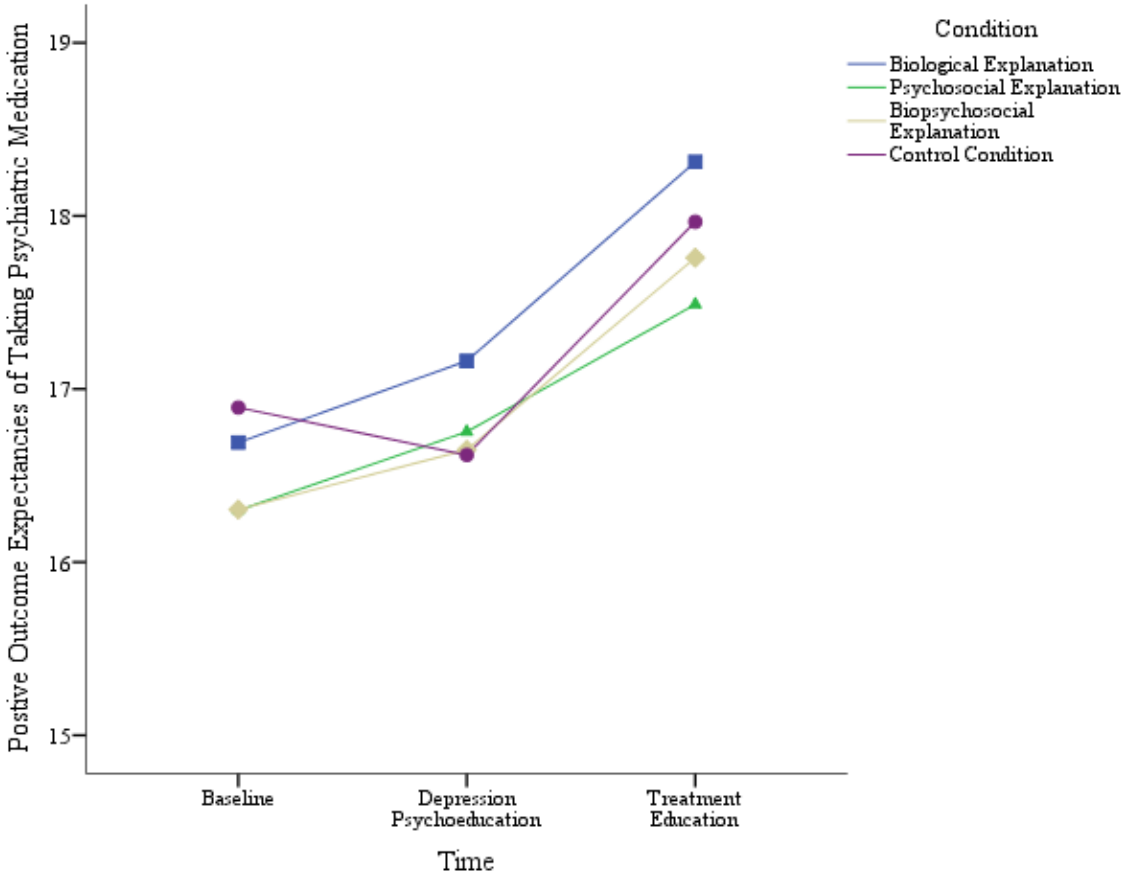


Figure 8. *Repeated measures ANOVA assessing difference between Time 1, Time 2, and Time 3 among biological, psychosocial, biopsychosocial, and control condition on positive outcome expectancies of taking psychiatric medications*

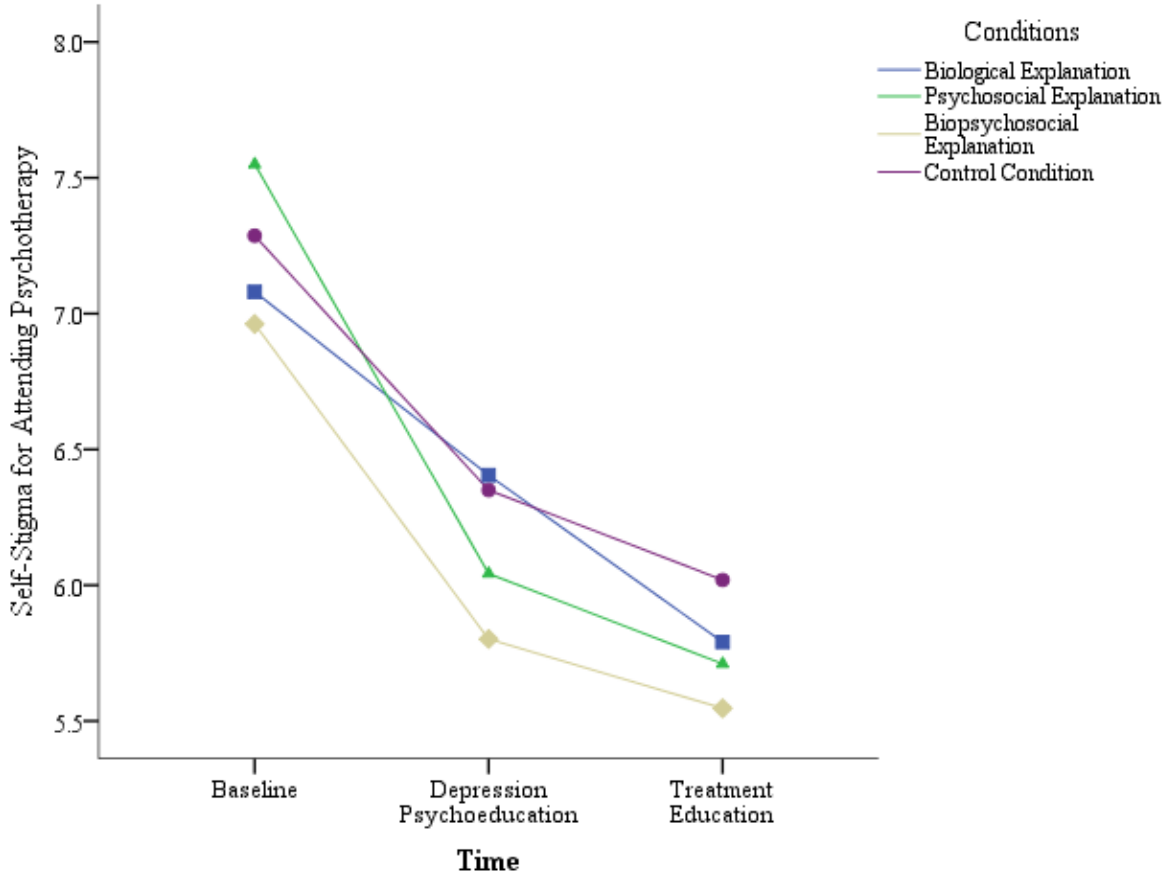


Figure 9. *Repeated measures ANOVA assessing difference between Time 1, Time 2, and Time 3 among biological, psychosocial, biopsychosocial, and control condition on Self-stigma for attending psychotherapy*

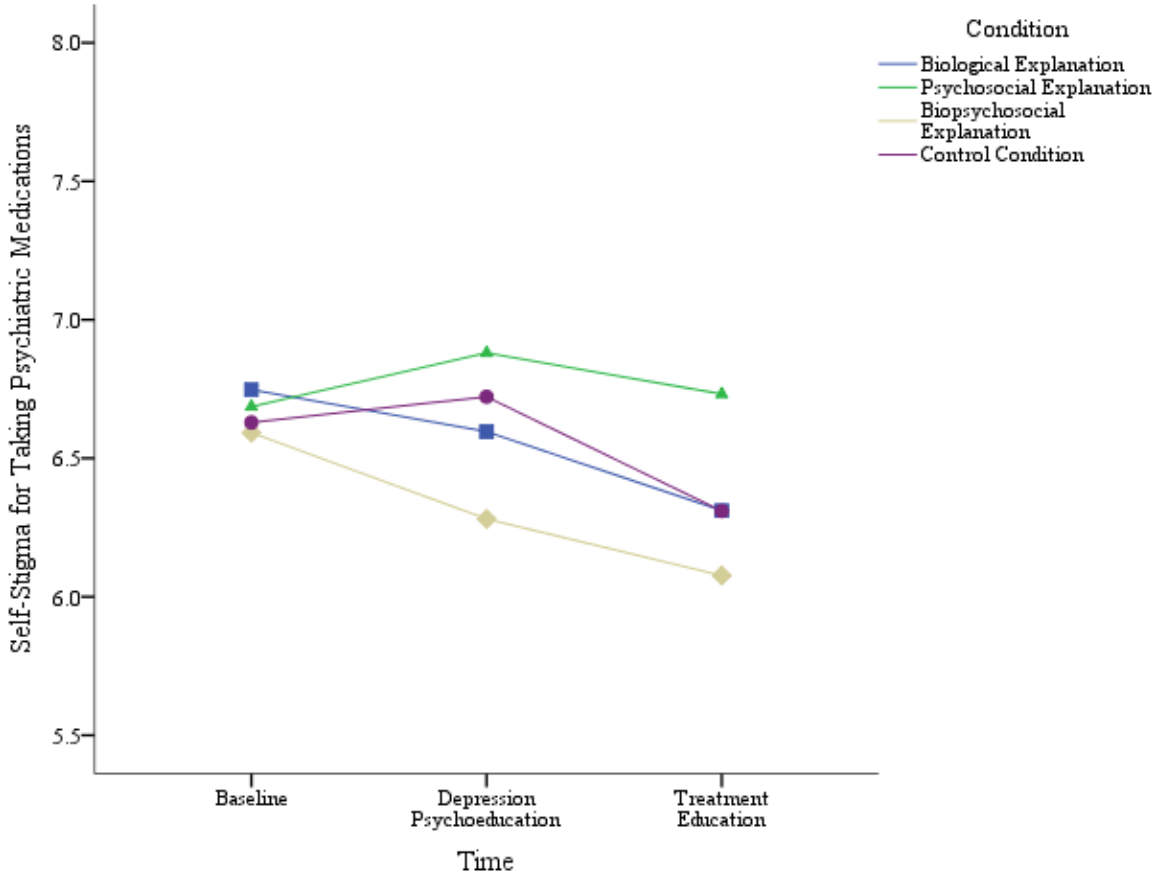


Figure 10. *Repeated measures ANOVA assessing difference between Time 1, Time 2, and Time 3 among biological, psychosocial, biopsychosocial, and control condition on Self-stigma for taking psychiatric medications*

CHAPTER 5

DISCUSSION

The current study utilized an experimental vignette design that presented participants with a fictional character that was experiencing depression followed by psychoeducation on depression and two treatment modalities (psychotherapy and psychiatric medications). The study attempted to test the effects of providing biological, psychosocial, and biopsychosocial explanations as well as no explanation, on the participants' perceived etiology of mental illness, self-stigma for seeking treatment, likelihood of treatment engagement, and positive outcome expectancies. In addition, the current study attempted to record whether providing education about psychotherapy and medications would "equalize" the differences produced by the models of mental illness. Given the paucity of research on self-stigma for seeking treatment and illness perception of depression, a set of exploratory aims included observing the relation to these variables to treatment engagement and outcome expectancies.

The relations between illness perceptions on positive treatment outcome expectancies

The first exploratory aim was to observe the association between the illness perception of depression and positive outcome expectancies of treatment (taking

psychiatric medications and attending psychotherapy). A limited number of studies have observed illness perceptions of depression (see for review Baines & Wittkowski, 2013). Four studies focused on illness perceptions of depression, and, of these four studies, one was completed on Latino men, two on an all-female sample, and one in a primary care sample. Overall, these studies recorded positive associations between treatment engagement and utilization of coping strategies on each of the illness perception factors (consequences, timeline, personal control, emotional representation, and concern). Unlike previous studies, however, the current study is the first to use an adapted version of the brief illness perception questionnaire (IPQ) and to include large and diverse sample.

The results of the current study showed that concerns about depression and thinking that depression would have an emotional effect had a positive association with optimistic outcome expectancies for both taking psychiatric medications and attending psychotherapy Moreover, endorsing having more control over depression was only positively associated with optimistic outcome expectancies of attending psychotherapy. These results highlight that perceived control and outcome expectancies of psychotherapy are highly correlated, and may be considered inseparable (Delsignore & Schnyder, 2007). Moreover, it lends support to previous studies that have found that perceived control over one's self and situation was associated with more positive attitudes towards psychotherapy and prognosis (Bohon et al, 2016; Gaudianoa, Hughesc, & Miller, 2013; Lam, Salkovskis, and Warwick, 2005).

In addition, in the current study endorsing that depression would affect a person's life and that depression would continue was positively associated with likelihood of taking psychiatric medications only. These results support previous findings that people

who perceive depression as chronic adhere to antidepressant treatment (Brown et al., 2001). Previous studies also have shown that severity of the depression is associated with endorsement of medication and hospitalization as fruitful treatments (Phelan, 2005; Phelan, Yang, & Cruz-Rojas, 2006; Wright, Jorm, Harris, & McGorry, 2007). Overall, the findings suggest that a sense of control over depression is connected with a more positive expectancy of psychotherapy; however, depression that is perceived as more persistent and having a greater impact in an individual's life appears to be associated with more positive attitudes towards psychiatric medications. In addition, these findings underscore the importance of highlighting to patients that they can have control over their condition and situation. Normalizing the patient's experience by providing information regarding the prevalence of depression. In addition, showing research that documents increased wellbeing may be achieved with lifestyle changes, psychotherapy, and/or antidepressants may result in decreases over concerns about the impact that depression has on their lives.

The relations between illness perceptions on treatment engagement

The second exploratory aim of the current study was to observe the relation between illness perceptions and likelihood of taking psychiatric medications and attending psychotherapy. The findings suggest that being concerned about depression, endorsing that depression would affect a person's life, endorsing that depression would affect a person emotionally, and endorsing that the experience of depression would continue was positively associated with increased likelihood of attending psychotherapy and taking psychiatric medications. These results further support Brown and colleagues' (2001) findings that a positive association exists between seeking treatment and utilizing

coping strategies based on perception of increased severity among patients in the primary care setting. Moreover, these results suggest that believing that one has control over depression was negatively associated with the desire to take psychiatric medications. Similarly, to positive expectancies of attending psychotherapy, this adds to the existing research that has suggested experiencing control over one's condition may reduce the likelihood of seeking medical treatments, such as psychiatric medications (Nieuwsma & Pepper, 2010).

Overall, these results have implications for increasing the likelihood of treatment engagement among mental health service consumers. For instance, it has been shown that as perceived psychological distress of depression increases people are likely to seek treatment beginning with self-help and continuing on to professional help (Jorm, Griffiths, Christensen, Parslow, & Rogers, 2004). Given the results of the current study, assessing patient's views towards their depression and discussing the level of severity of their condition may promote engagement in treatment. For example, reflecting to patients how their depression affects their emotions and their life as well as how chronic and concerning their depression is might result in increased positive expectancies and likelihood of attending treatment. At the same time, providers should evaluate patient's perceived controllability over their depression in order to provide information about how effective psychotherapy is in relieving depression. Also, they might suggest treatments that the patient would have greater receptivity towards instead of primarily suggesting psychiatric medications (Lawrence et al., 2012).

Self-stigma of seeking treatment as predictor of treatment engagement and outcome expectancies

The third exploratory aim observed the relation between self-stigma for seeking treatment on treatment engagement and positive outcome expectancies. Unlike previous studies, the current study observed the relation between self-stigma for seeking help and two commonly used treatments of depression, attending psychotherapy and taking psychiatric medications. A small percent of the variance in positive expectancies of psychotherapy treatment was predicted by self-stigma for attending psychotherapy and taking psychiatric medications. Moreover, increases in negative views of taking psychiatric medications and decreases in negative views of attending psychotherapy were found predict more positive *expectations* of attending psychotherapy. Moreover, participants who had less negative views of themselves if they attended psychotherapy endorsed greater *likelihood of attending* psychotherapy. These findings support the documented association that less self-stigma for attending mental health treatment was related to greater likelihood of seeking mental health services (Jenning et al., 2015; Vogel, Wade, & Haake, 2006; Vogel, Wade, & Hackler, 2007). Moreover, in the current study endorsing greater self-stigma for taking medications may have predicted seeking psychotherapy, because using medications suggest that individuals may be addicted or may become an addict (Interian et al., 2001; Read, Cartwright, Gibson, Shiels, & Magliano, 2015).

Moreover, as expected participants who held more negative views for attending psychotherapy and less negative views of themselves if they took psychiatric medications endorsed greater likelihood of taking psychiatric medications. However, only less

negative view of themselves if they took psychiatric medication were related to more positive outcome expectancies of taking psychiatric medications. All together these findings highlight the importance of including interventions that reduce stigma related to treatment in order to promote positive expectancies and engagement in psychotherapy or psychiatric medication.

Effects of causal models of depression on perceived etiological models of mental illness

The fourth aim of the study was to observe the differences among the biological, psychosocial, biopsychosocial, and the control condition on perceived etiologies of depression. Unlike previous studies that have recorded participants' beliefs in regards to the *credibility* of different etiological explanations of depression (Kemp, Lickel, & Deacon, 2014), the current study observed changes in the *endorsed causes* of depression by the participants before and after the introduction psychoeducation of depression. Overall, the hypotheses that different depression psychoeducation conditions would result in increases of their respective etiological models and decreases in other models was not supported. Also, the expectation that there would be statistically significant changes in the biological, psychosocial, and biopsychosocial conditions in comparison to the control condition was also not supported. However, results show that presenting participants with an explanation that emphasizes a particular etiological cause does increase the belief that that specific factor contributes more to depression across time within that experimental condition.

Moreover, the results of the study seem to suggest that certain beliefs may be more malleable than others. Participants who received biological causal explanations increased

their endorsement of biological causal beliefs of depression and decreased their beliefs of psychological and social causes. The biological condition was the only condition in which there was reduction in endorsement about other causes of depression. The trend of reducing beliefs in other causes after exposure to biological explanations may be a result of the naturalistic fallacy and neuro-essentialist beliefs, or the belief that mental illness is a biological "disease" that is determined by genetic factors to the exclusion of every other cause, and that it is fixed and unchangeable (Phelan, 2005). In line with this interpretation, Boyesen (2011) documented that providing biological explanations to participants led to greater endorsement of essentialist beliefs of mental illness—that disorder was fixed and immutable, in comparison to explanations that highlighted freedom of choice.

Therefore, individuals who received the biological etiological explanation may reduce their understanding exclusively to that one factor and believe it to be the only contributor to their illness. In addition, the tendency towards seeing biological or genetic attributions as essentialist and unchanging may be understood in the context of oversimplification of genetic research for the general public (for a review see Dar-Nimrod & Heine, 2011). Studies have recorded that the general public holds fatalistic attitudes in relation to genetics and genetic explanations of their mental illness (Alper & Beckwith, 1993; Easter, 2012).

Unlike biological causes, participants appeared to be more likely to increase their endorsement of social and psychological causes when psychosocial explanations were presented than when biological causal explanations were presented. In the current study, psychosocial explanations included both social and psychological factors (i.e., loss of

loved ones, poverty, pessimistic worldview, etc.), which may explain why these two causes increased after exposure to psychosocial psychoeducation of depression. There was not a reduction in the endorsement of biological causes after psychosocial explanations were provided. The maintenance of biological endorsement may be explained in the context of contemporary campaigns that promote biological causes of mental illness (Schomerus et al., 2012) and the worldwide increase in knowledge related to the biological model (Angermeyer et al., 2009; Miller, 2010). Participants may have internalized that biology contributes to mental illness making it difficult to change these beliefs with psychoeducation that only emphasizes psychosocial factors. In addition, the maintenance of the endorsement of biological causes in the face of psychosocial education might be because the psychosocial condition emphasized causal factors that can be changed by behavior, life events, self-esteem, and worldview, and that cannot be easily reduced to an unchanging "essence placeholders" such as genes (see Park et al., 2015). Therefore, including information regarding neuroplasticity and epigenetics is important to counter essentialist beliefs of the biological model (Lebowitz et al. 2013, 2015).

Moreover, counter to previous research that has shown that biopsychosocial explanations produced increases in the belief that psychosocial factors that may cause and contribute to depression (Deacon & Baird, 2009), the present study found that the control and biopsychosocial causal explanation conditions had no effects on psychological, social, and biological causal beliefs. While the biopsychosocial condition provided explanations of the three factors known to produce mental illness, the control condition provided no explanation, but described that "scientist do not adhere to any one as the sole

predictor of depression". In this case, the biopsychosocial explanation might have provided too much information to participant, which may lead a cognitive overload for the participant (Reutskaja & Hogarth, 2009), and the control condition may not prompt thinking about any one etiological factor producing no statistically significant changes. Also, the information of all three factors and no information about any of the factors could similar result in no increase or decrease, because it suggested that all causal factors of depression could be weighted equally.

All together these findings may be applied to psychoeducation that may promote inclusivity of all factors that produce depression. In particular, avoiding the utilization of explanations that emphasize purely biological causes to prevent the reduction to this one factor. Without an explicit explanation to counter why the biological bias is erroneous participants retained their biologicals beliefs, but did not increase them. The emphasis of biopsychosocial factors maybe more beneficial to patients as these explanations do not produce increases or decreases of one factor over the other.

Effects of causal models of depression on treatment engagement

The fifth aim of the study was to record the shifts in participants' beliefs regarding engaging in different forms of treatment, such as medication, psychotherapy, and non-professional help. To date, a handful of studies have observed difference in motivation to engage in treatments among differing explanations of mental illness (e.g. Phelan, Yang, & Cruz-Rojas, 2006). Previous studies have recorded that individuals who are presented with biological explanations tended to increase their endorsement of psychiatric medication and hospitalization as appropriate treatments in comparison to other explanations (Kemp, Lickel, & Deacon, 2014). Moreover, biological explanations have

been found to lead to endorsing greater likelihood of seeking help in comparison to other explanations (Goldstein & Rosselli, 2003). At the same time, previous studies have found statistically significant differences between the endorsement and preference of psychosocial interventions and medications, with psychotherapy being endorsed as more effective for the treatment of mental illness (Gaudianoa, Hughesc, & Miller, 2013; Prins et al., 2008). At best, the state of the literature could be said to be in conflict.

The present study adds to, and stands in contrast, with some findings from previous research. The biological explanation condition led to decreases only in the endorsement of seeking non-professional help. Decrease in endorsing seeking non-professional help could be a function of the increased perceived severity of the depression caused by biological explanations (Phelan, 2005; Phelan, Yang, & Cruz-Rojas, 2006). Moreover, another explanation for the decrease in endorsements for seeking non-professional help may be that in the vignette the doctor that provided to the fictional character a diagnostic label 'major depressive disorder', which is an official psychiatric diagnosis. The utilization of diagnostic labels has been associated with perceiving mental illness as more severe and requiring professional treatment (Wright, Jorm, Harris, & McGorry, 2007).

Also, the utilization of psychiatric labels may explain why participants in the biopsychosocial explanations and control condition endorsed increased utilization of medication after psychoeducation of depression was presented. The increased endorsement of taking psychiatric medications within the biopsychosocial condition may be an effect of the biological elements in the explanation along with the usage of psychiatric labels. The biopsychosocial condition may have resulted in geneticization of

depression, which may have led to the notion that the person did not have control over their illness and therefore the best course of action would be medication.

Similarly, participants in the control condition may have used the psychiatric labels and the fictional doctor in the vignette as the only way to make sense of the utility of treatment, given that no other information was available to assess the severity of depression. It is also possible that there were no increases in seeking non-professional help across conditions, because there is an already existing skepticism towards non-professional treatment for psychiatric illnesses in the general public (Angermeyer, Matschinger, & Riedel-Heller, 1999).

Furthermore, the psychosocial explanation increased the likelihood of endorsing attending psychotherapy. These results add to previous studies that have found that psychosocial explanation increase endorsement of positive expectancies of psychotherapy Tompkins, K. A., Swift, J. K., Rousmaniere, T. G., & Whipple, J. L. (2016). Potentially the psychosocial explanations reinforced existing beliefs about the best modes of treatment for these individuals (Furnham, Ritchie, & Lay, 2016; Jorm, 2012). Moreover, the psychosocial explanation included the following statement:

> "Sometimes the circumstances involved in depression are ones over which an individual has little or no control. At other times, however, depression occurs when people are unable to see that they actually have choices and can bring about change in their lives."

The psychosocial explanation provides education about psychosocial factors that may help "undo" the effects of reductive and deterministic effects that psychiatric labels that suggest severity as people are primed to see that they have control over their condition.

The findings from the current study have multiple implications for psychoeducation campaigns focused on causal factors of depression. Psychoeducational campaigns should focus on psychosocial factors as these explanations of mental illness increased the likelihood of endorsing attending psychotherapy, a treatment that has been demonstrated to reduce depression. Future studies on causal beliefs of depression might control for the utilization of psychiatric labels in order to differentiate the role of psychoeducation versus the label. However, this might decrease external validity, given that psychoeducation information is usually anchored in the discussion of a particular psychiatric condition. Also, not all participants may have found psychotherapy, psychiatric medications, or non-professional help to be viable treatment options, although they are the most common treatment recommendations. Future studies might use open-ended questions that allow participants to generate their own possible treatments or coping strategies.

Effects of causal models of depression on treatment positive outcome expectancies

The third aim of the study was to observe the effect of psychoeducation of depression etiology on treatment outcome expectancies. Results indicate that biological explanations did not increase positive expectancies of taking psychiatric medications or attending psychotherapy. These results add to previous conflicting findings that expectancies and beliefs about treatment follow the etiological model presented to the individual (Brandon, Hughesc, & Miller, 2013; Deacon & Abramowitz, 2005; Iselin & Addis, 2003; Kemp, Lickel, & Deacon, 2014).

Phelan, Yang, and Cruz-Rojas (2006) documented that, while biological etiological models may lead people to endorse psychiatric intervention, it does not result

in positive prognosis for mental illness. That is, individuals may be open to taking psychiatric medications, but not believe that they would get better. Also, Deacon and Baird (2009) have shown that individuals who received chemical imbalanced explanations perceived depression as more chronic, in need of longer term treatment, and with less likelihood of improvement in comparison to biopsychosocial condition. Therefore, it could be possible that receiving biological explanations participants did not perceive positive outcome from any form of treatment due to an expectation that the condition would not improve. Also, this may explain why there was not an increase the likelihood of attending in psychotherapy or taking medications.

In contrast, participants who received biopsychosocial explanations increased their endorsement of positive expectancies of attending psychotherapy, and participants who received a psychosocial explanation had increases in positive outcome expectancies for taking psychiatric medications and attending psychotherapy. The increased endorsement of taking psychiatric medication and attending psychotherapy because participant in this condition who perceive their problem as being influenced by psychological and social forces also tend to perceive more control over their condition and not see themselves as categorically different from others (Lam, Salkovskis, and Warwick, 2005). Also, participants within these experimental conditions may believe that they could have control over their situation, and might be more open to multiple forms of treatment as they may experience "a global sense" of control over a psychiatric condition. That is unlike the biological explanations, which may leave individuals feeling that no intervention could produce positive change.

No changes were present in the control condition in regards to positive outcome expectancies of psychotherapy or psychiatric medications. This lack of statistically significant increase or decrease could be accounted by the lack of information related to mechanisms involved in depression. This lack of information might have made it hard for individuals to imagine or predict the utility of anyone treatment without a framework to make sense of those treatments, and increase positive expectancies.

In the context of these findings, psychoeducational programs should focus upon psychosocial factors that were found to promote positive expectancies for the more commonly use treatments of depression, psychotherapy and psychiatric medications. In particular, psychosocial explanations of depression should be provided to individuals with mild to moderate depression as this would promote the utilization of psychotherapy, a treatment that has been found to be helpful for his level of severity, and at the same time maintain positive expectancies for taking psychiatric medications. Moreover, future research may seek to observe whether the psychological construct of perceived control over depression plays role in these positive outcome expectancies, as previous research suggest that there a significant overlap between control expectancies and outcome expectancies (Delsignore & Schnyder, 2007).

Effects of causal models of depression on self-stigma for seeking treatment

The fourth aim of the current study was to observe the effects of explanatory models of depression on self-stigma for taking psychiatric medications and self-stigma for attending psychotherapy. In the current study there were no difference among conditions on self-stigma for attending psychotherapy or taking psychiatric medications between baselines and after psychoeducation of depression was provided. That is, no one

explanatory model produced statistically significant increase or decrease of self-stigma for seeking treatment in comparison to the other.

The existing literature suggests that self-stigma of mental illness has been positively associated with self-stigma for seeking treatment (Jennings et al., 2015). Previous research has observed that mental illness self-stigma is affected by explanatory models and noted that biological explanations were associated with having less control and less self-blame over one's condition (Deacon & Baird, 2009; Lebowitz, Pyun, & Ahn, 2014; Lee, Farrell, McKibbin, & Deacon, 2016). The current study replicates experimental research observing no statistically significant differences between biological versus control conditions on self-stigma (Kemp et al., 2014). While there were no statistically significant effects of causal models of depression on self-stigma for seeking treatment, this study is the first to examine this question.

Moreover, it is important to note that even though no condition decreased or increased self-stigma for seeking treatment more or less than another, there were changes in regards to time. Both self-stigma for taking medication and attending psychotherapy decreased from baseline and after psychoeducation of depression was presented to participants. This decrease in self-stigma for seeking treatment may be accounted by the utilization of psychiatric labels, a factor that was present across condition and which has been found to be related to positive help-seeking attitudes (Wright et al., 2007). The finds suggest that providing patients with information regarding depression may be enough to create changes in self-stigma for seeking treatment. However, future research should observe the effects of providing depression psychoeducation and treatment with and without psychiatric labels.

Effects of psychoeducation of depression and treatment education on positive outcome expectancies, treatment engagement, and self-stigma for seeking treatment

The eight aim of the current study was to observe the effects of providing treatment education to participants. To date, few studies have observed the effect of providing treatment information and its effect on outcome expectancies, self-stigma for seeking treatment, and treatment engagement (see for review Constantino, 2012; Dew & Bickman, 2005; Glass et al., 2001; Greenberg et al., 2006). Moreover, the study attempted to record whether *equivalence* existed among conditions on the different outcome variables at Time 3. After treatment education was provided to participants there were no interactions effects between time and condition, and there were no statistically significant main effects of group differences across any of these outcome variables. There were, however, main effects of time for all three outcome variables between depression psychoeducation and treatment education.

First, there was an increase in likelihood of taking psychiatric medications and a decrease in likelihood of seeking non-professional help between Time 2 and Time 3. The demands characteristic of the experimental manipulation should be taken into consideration. For instance, the reduction in endorsement of non-professional help may have been due to the introduction of psychoeducation based solely within a professional treatment context. Participants received education only about psychiatric medication and psychotherapy, and therefore may have continued to perceive these established treatments for psychiatric conditions as more acceptable than non-professional treatment. This caveat is particularly important in light of mental health literacy research has documented that individuals utilize self-help strategies for mild to moderate depression

before seeking out professional help (Jorm, 2012). Also, of note is that different cultural groups prefer non-professional help as first line of treatment (Caplan et al., 2012).

Second, there were increases in positive outcome expectancies of taking psychiatric medication and attending psychotherapy. The observed increase of both treatments may be best understood as a function of the explanation provided of the treatment. Participants were told how both treatments worked and that these treatments would help them. The increase of positive expectancies for both treatments further replicated the existing literature of interventions that show that providing information in written or audio-visual format leads to increases in positive expectancies for psychotherapy and psychopharmacological treatment (Noble, Douglas, & Newman, 2001).

Third, there was a decrease in self-stigma for attending psychotherapy and taking psychiatric medications. A review of recent research on self-stigma has demonstrated that presenting psychoeducation of depression and its treatments leads to reduction in self-stigma (Mittal, Sullivan, Chekuri, Allee, & Corrigan, 2012). Most of the studies reviewed observed changes across time and did not have a control condition. The findings of the current study suggest that changes in negative attitudes regarding treatment occurred regardless of condition. In other words, presenting information related to any causal model of depression along with education about psychotherapy and psychiatric medication results in a reduction of self-stigma for seeking those particular treatments across condition. Moreover, in the current study all participants were presented with a vignette of a character experiencing depression, and a vignette of doctor who provides a diagnostic label and explanatory model of depression. Exposure to this information may

explain why there was reduction in self-stigma across all groups, particularly as research has demonstrated that contact with a mentally ill person and information about mental illness produces decreases in stigma and self-stigma (Yanos, Lucksted, Drapalski, Roe, & Lysaker, 2015).

Unfortunately, the changes could not be fully attributed to the presentation of treatment education, because there were not any statistically significant changes between groups before or after the psychoeducation manipulation, or before and after treatment education. Essentially there were no difference between the conditions from baselines and across time points, and no one condition demonstrated that a greater endorsement of any particular outcome variable. Changes up to treatment education could be accounted by the effects of exposure to any information about treatment or depression regardless the etiological model.

Overall, the findings suggest that providing treatment information may lower self-stigma for seeking treatment, and that regardless of causal models presented to patients, explanation of possible treatments of depression can increase positive expectancies of treatment. Unfortunately, it cannot be concluded whether time or the actual inclusion of treatment information helped, because it was beyond the scope of the current study to observe whether or not treatment education would have an effect on the outcome variables. Given the results of the current study, clinicians should provide treatment information in a step-wise fashion in order to prevent the negative effects biological factors, such as decreases in endorsement of non-professional help. Psychosocial explanations, treatments, and interventions should be presented first, particularly if the level of severity of the depression is within the mild to moderate range. However, if the

patient does not respond to psychosocial treatments, or if the depression is severe, then biopsychosocial explanations and treatments should be provided afterwards.

Clinical Implications

Etiological models of mental illness and health beliefs have a strong effect on patient's attitudes towards treatment and prognosis. Studies have demonstrated that shifting psychoeducation and education about mental illness can successfully change people's attitudes and lead to behavioral change among Latinos (Cabassa et al., 2015). In addition, research has shown that exposure to information about treatment, such as advertising and mental health literacy that may include a list of symptoms, labels for conditions, and treatment options, can promote the utilization of treatment (Gallo et al., 2015; Schoumor et al., 2009). Moreover, changes in treatment expectancies have been shown to improve treatment in outcomes, particularly psychotherapy and medication use (see for examples, Constantino et al., 2011; Devilly & Borkovec, 2000). A review of different passive (i.e., written, audio, or visual material) psychoeducation programs has shown that providing information about symptoms of depression and existing intervention lead to symptom improvement (Donker, Griffithsn, Cuijpers, Pim, & Christensen, 2009).

Moreover, a great number of patients, estimated at ranging from 50% to 75%, receive treatment for depression in a primary care setting (Bray, 2016). In general, primary care is considered the point of entry for mental health treatment; therefore, it is imperative that patients receive information regarding their diagnosis that helps cultivate motivation to engage in treatment, hope about treatment and self-care practices, and general openness to change that would help them in the road to recovery.

Psychoeducation of depression in the primary care setting, including descriptions of symptoms and causes, and information about life styles change (e.g. diet, sleep, self-help, and exercises), psychotherapy, and pharmacological treatments, has been found to reduce symptoms of depression (Casañas et al., 2012; Shin et al., 2014).

In addition, patient's must not only be informed about possible treatments, they must also be educated about side effects and the appropriate treatment for a given level of severity. In relation to medications for depression, Lawrence and colleagues (2012) recorded that over half of PCPs would prescribe medications to mildly depressed patients. This is particularly problematic because a recent meta-analysis did not find strong evidence for the benefits of prescribing antidepressants to patients who experience sub-threshold depression and mild depression (Cameron, Reid, & MacGillivray, 2014), and restricts the patient's capacity to decide on other evidence-based treatments for depression.

Moreover, Byng, Bury, and Weaver (2007) documented that close to half of patients seeking consultation for depression believed that their physician omitted information about antidepressant, in particular the side effects of antidepressants. The omission of side of effects may lead to non-adherence and discontinuation of treatment once these side effects become noticeable to the patient. Treatment adherence is a problem for psychosocial treatments as well. For instance, one-third of patients offered psychosocial treatments (psychotherapy, group therapy, and counseling) adhered to treatment compared to half of the patients who adhered to medication when these treatments were offered (Vuorilehto, Melartin, Riihimäki, & Isometsä, 2016). The high number of nonadherence for professional treatments, highlight the need to provide

information of non-professional treatments to patients as these practice have been shown to be helpful stand alone treatments for mild depression and adjunctive treatments for more severe levels of depression.

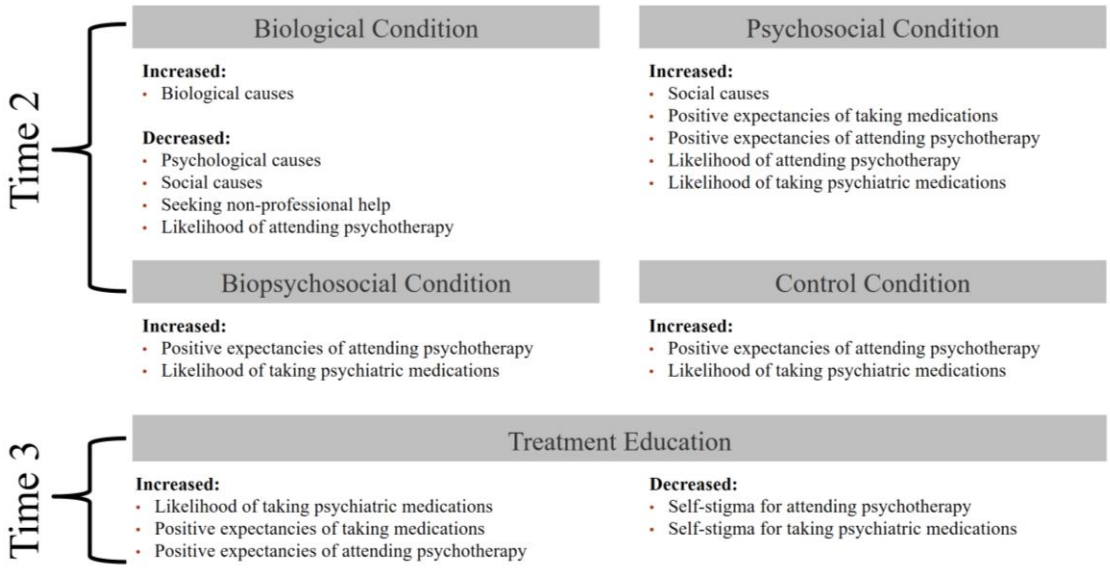


Figure 11. *Summary of increases and decreases of all outcome variables from Time 1 to Time 3.*

The current study primarily focuses on the effects of causal explanations of mental illness and did not control for the presence of diagnostic labels or whether listing symptoms of depression might be helpful to present to participants. However, the current study adds to the existing literature that has found that presenting information regarding etiologies of depression is beneficial in changing expectancies and likelihood of engagement in treatment. In particular, the presentation of psychosocial explanations led to increased positive expectancies of attending psychotherapy and taking psychiatric medications, increased the endorsement of likelihood of attending psychotherapy, and

increased endorsement of social causes, while not reducing beliefs about other causal models or treatments. Biological explanations, unlike psychosocial explanations, decreased positive expectancies of non-professional treatments and psychotherapy, decreased endorsement of other causal models of depression, and did not increase positive expectancies of any treatment. The biopsychosocial and control condition only produced increases in likelihood of taking medication and positive expectancies in attending psychotherapy. In light of these findings a list of recommendations and considerations for psychoeducation and mental health literacy is as follows:

Avoid providing patients purely biological explanations. Providing purely biological explanations of mental illness appears to be unhelpful to patients and the psychological and psychiatric community. This explanatory model reduces the belief that other factors play a role in depression, creating difficulties for patient to perceive the possibility of change from other treatments. Moreover, biological explanations do not increase engagement or positive expectancies of taking psychiatric medications, rather they reduce the likelihood of engaging in first line and adjunctive interventions scientifically found to be helpful for depression, such as exercise, social support, and psychotherapy. In the context of existing guidelines and research, patients who suffer from mild to moderate depression have been shown to benefit most from lifestyle changes and psychotherapy (Gelenberg et al., 2010). These patients may be potentially be psychologically harmed by suggesting that there depression purely caused by biology, because this unsubstantiated beliefs may result in shifting of attitudes and beliefs that predisposes them to be unreceptive to helpful treatments (i.e., lifestyle change and psychotherapy).

A core recommendation of this study is reducing the use of phrases such as "brain disorder", "brain disease", and "disorder of the brain" in informational pamphlets and psychoeducation that is provided to mental health consumers. Instead, it may be best to present biological factors, such as genes or neurotransmitters imbalances, as interacting and changing with the environment (Gregurek, 2012; Zaman, 2010). Including information regarding neuroplasticity and epigenetics may help towards this end. Prior research on biological explanations that included information regarding neuroplasticity and epigenetic factor, and that highlighted the malleability of the brain, reduced prognostic pessimism and hopelessness that usually result from biological explanation that do not present these factors (Lebowitz et al. 2013, 2015).

Highlight the significance of psychosocial causal factors as strong contributors to depression. The existing literature suggests a receptivity for psychosocial explanations and treatments from the general public (Hanson, Webb, Sheeran, & Turpin, 2016; Jorm, 2000). In the current study, solely psychosocial explanation increased the endorsement of social causes while not reducing other possible explanatory factors. Moreover, psychosocial explanations increased likelihood in the utilization of psychotherapy and did not produce a reduction in the endorsement of initially believed to be helpful treatments. Therefore, psychosocial causal factors and the reminder that patients have control over their condition not only promote a scientifically proven efficacious treatment, but increase positive expectancies of psychotherapy treatments (Dew & Bickman, 2005; Greenberg, Constantino, & Bruce, 2006)

Moreover, highlighting psychosocial factors in psychoeducation may increase depressed individuals' likelihood of engaging in psychotherapy, while not impacting

attitudes towards utilization of adjunctive treatments such as psychiatric medications or non-professional help. The prioritizing of psychosocial explanations is important, given that given primary care physicians tend to prescribe medication as first line of defense, and because studies have shown that an antidepressant prescription signal to patients that their depression is more severe then they initially might have believed. The recommendation of highlighting psychosocial factors is particularly important given that existing depression treatment guidelines in much of the world promote utilization of psychiatric medication only for severe cases of depression, if at all (Cosgrove et al., 2014).

Reducing self-stigma for seeking treatment to promote positive expectancies and treatment engagement. A review on existing interventions to reduce self-stigma for individuals experiencing mental illness identified common elements across sets of proposed interventions, which included psychoeducation about mental illness, psychotherapy, and empowerment and improving self-esteem strategies (Mittal, Sullivan, Chekuri, Allee, & Corrigan, 2012). In light of the findings in the current study, it might be helpful that self-stigma interventions included as part of psychoeducation campaigns. Indeed, psychoeducational interventions educate patients about mistaken beliefs related to medications, such as medication addictiveness, have been shown to reduce negative attitudes towards medications.

Moreover, including information about possible negative attitudes that patients might hold about seeking treatments along with suggestions for particular treatments that may reduce stigma, self-criticism, and negative self-evaluation (for a review of self-criticism reduction strategies see Kannan & Levitt, 2013) should be provided to mental

health consumers to reduce the self-defeating and stigmatizing attitudes. Moreover, including the following statement in psychoeducation campaigns such as, “some people fail to seek attend psychotherapy or take antidepressants, because they believe that people would judge them or that something might very wrong with them”, may help reduce stigma. Similarly, acknowledging that individuals may see themselves are “psychologically weak” if they attend psychotherapy can lead to a discussion of self-stigma; explicit recognition of the existence of these thoughts along with a description of psychotherapy may be helpful to reduce these cognition and negative emotional responses.

Limitations and Strengths

The findings of the current study should be interpreted in the context of several limitations. One, participants were recruited and completed the survey online. Online sampling is a strength, because it provides access to a diverse group of participants from the community. The sample was two-thirds White, which represents the actual distribution of race and ethnicity in the US population, but cannot provide a deeper understanding of the ways that other cultural, racial, and ethnic groups would have been affected by the different depression psychoeducation conditions. Studies have shown that different views of mental illness exist in other countries (Glazer et al., 2004), as well as within the United States by different cultural groups (Caplan et al., 2012).

Two, the psychoeducation was presented in written media and therefore this may prohibitive to individuals whose reading capacities were limited or who have preference for visual media. Research has shown pamphlets with images and story lines in everyday context influence people’s perceptions of mental illness and their help-seeking behaviors

more than written material (Cabassa et al., 2015). In addition, this may explain why the experimental manipulation might have failed to produce statistically significant changes across time points between groups.

Three, the utilization of diagnostic labels within the experimental manipulation might have affected the level of perceived severity of the fictional character by the participants. This might have reduced the observed differences between groups on across the analysis. Also, the psychoeducation vignette, which is a doctor providing information to the fictional character about their condition, could have influenced participant's perception of depression.

There are notable strengths about the current study as well. First, the study was vignette-based experiment, which elicited participants' lay beliefs about depression and it treatments by requesting participants to place themselves into the character situations. This allowed for participants with no previous experience with depression or treatment to report what they would do if they were in that situations. At the same time, it is important to note that what the participants believed they might does not always translate to that behavior.

Second, previous studies have utilized a credibility check of the manipulation, that is whether the explanation provided was convincing and believable. This is the first study to assess changes of endorsed causes of depression before and after experimental manipulation and compare among different etiological explanations of depression. This important as studies have found that individuals hold a variety of believes regarding mental illness (Elliott, Maitoza, & Schwinger, 2012). Third, the current psychoeducation vignette was modeled after commonly presented information from the National Institute

of Mental Health, American Psychological Association, and American Psychiatric Association websites. No study to date has adequately assessed the response of participant's who encounter information from these institutions. Fourth, unlike previous studies (Jenning et al., 2015), the current study observed self-stigma for attending psychotherapy and taking psychiatric medications, and their relation to outcomes variables separately. The current study adds to the limited literature of treatment seeking stigma. In particular, it exposes the complex relation between self-stigma for two commonly used treatments for depression (i.e., psychotherapy and medication).

Future Research

There is a body of research that shows the way that people make sense of their mental illness and how presenting different model of mental illness shifts their perceptions of expectancies, treatments, and stigma. However, there are no qualitative studies recording the way that people make sense of information that is contradictory to their preexisting beliefs of mental illness. Future qualitative research, particularly in the setting of focus groups, would be helpful to observe the ways that people understand psychoeducation of depression and treatments.

Moreover, future research should focus on developing and testing the efficacy psychoeducation that delineates the interaction between different causal factors. The biopsychosocial model continues to be championed as the most inclusive explanation of mental illness (Epstein, 2014). A possible solution to this problem is developing and testing the effect of a psychoeducation campaign that delineates the interaction between different causal factors rather than listing factors that contributed to mental illness. For instance, biopsychosocial explanations of depression that might improve expectancies of

all forms treatments if they highlighted how the environment and behavior affects neural wiring and how the environment affects gene expression (Gregurek, 2012; Zaman, 2010).

To date, multiple studies have observed the separately relation between psychiatric labels and stigma, and explanatory models of mental illness on prognosis and other outcomes (Jorm, 2012). Future research should observe the role of explanatory models of mental illness on individual's expectancies, perceptions of treatment, and treatment stigma while controlling for the effects of psychiatric labels. Moreover, the current study suggests that reduction in self-stigma for seeking treatment may be a function of exposure to any information related to depression, psychiatric labels, and its treatments. Future research is required to understand how wording and active stigma reduction components may alter different forms of psychoeducation of depression and may affect individual's attitudes towards seeking treatment (Phelan, 2005).

Moreover, there is a growing body of literature expanding all the way back to 1960s in regards to lay beliefs and explanatory models of mental illness among different cultural group (see for a review Abdullah & Brown, 2011). However, few studies have observed the receptivity of the current biopsychosocial explanations of mental illness by these cultural groups. Future research studies should observe the impact of different etiological models mental illness impact stigma, and treatment expectancies and engagement among different cultural groups.

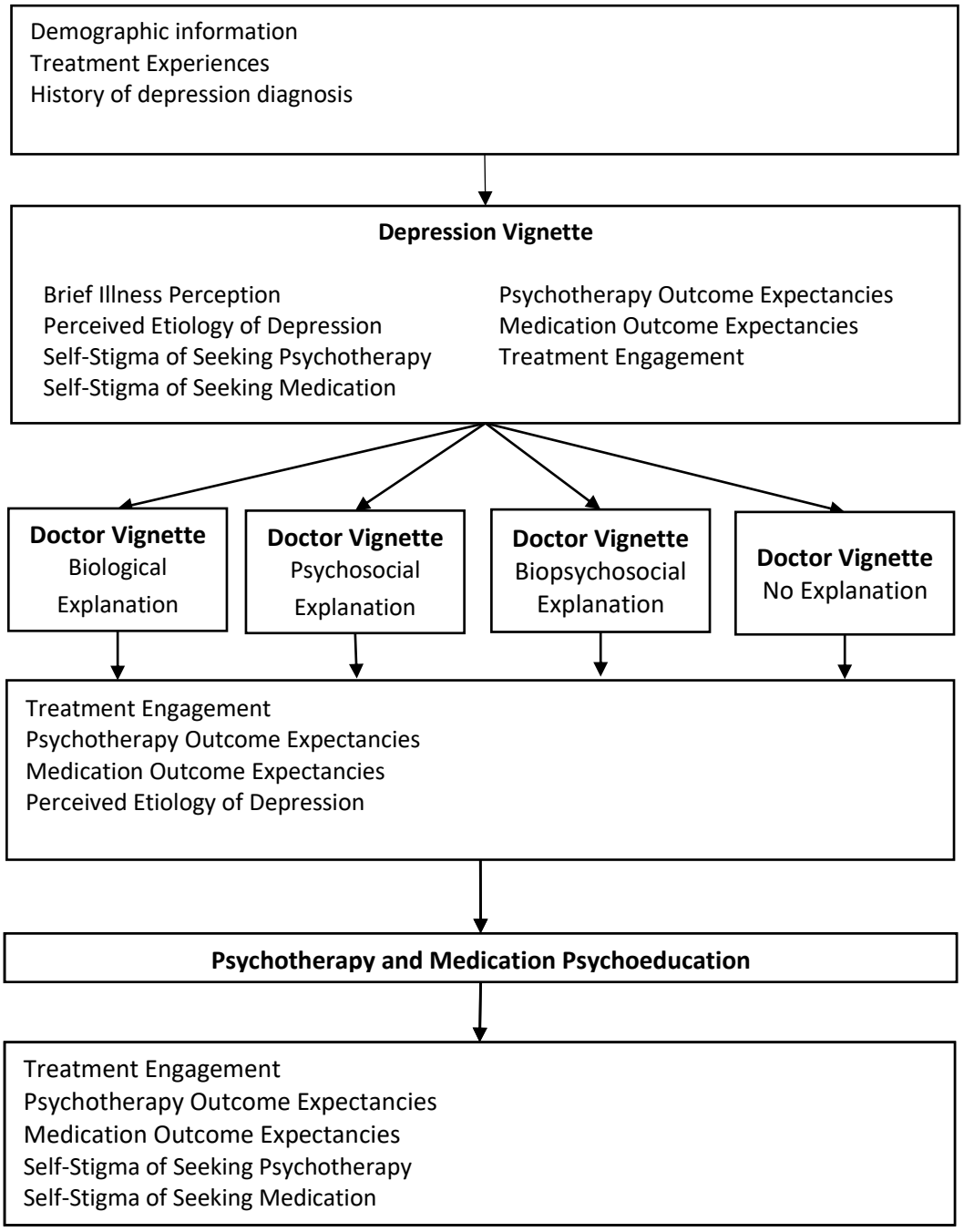
Conclusion

In conclusion, presenting psychoeducation of depression to participants can change their view regarding perceived etiology of depression, treatment outcome expectancies, and likelihood of treatment engagement. However, particular models of

psychoeducation of depression, such as the biological and psychosocial do not appear to not have positive effects on self-stigma for attending psychotherapy and or for taking psychiatric medications. It appears what might be most important in relation to self-stigma for seeking treatment would be exposure to any type of information related to depression and its treatments. Moreover, treatment education appears to contribute to the time trend of reducing self-stigma, increasing likelihood of engaging in treatment, and increasing endorsement of positive expectancies beyond the particular psychoeducation model utilized. While all outcome variables appeared to have reached equivalence defined 10% margin of difference, the current study could not fully substantiate the claim that it was due to presentation of treatment education. These findings despite the context of their limitations provide information and direction for the development of evidence-based psychoeducation for mental health service users by highlighting importance of psychosocial factors to further promote positive expectancies and utilization treatments that in accordance of with professional set guidelines for the treatment of depression.

APPENDIX A

FIGURE 12. FLOWCHART OF EXPERIEMENTAL VIGNETTE DESIGN



APPENDIX B

SAMPLE OF SURVEY

Demographic Information

1. Age:
2. Sex:
3. Gender:
4. Sexual Orientation:
5. Race\Ethnicity:
6. Income:
7. Education:
8. U.S.\foreign born
9. Years in the U.S.
10. Are you currently attending psychotherapy? Y/N
11. Have you ever attended psychotherapy? Y/N
12. Helpfulness of psychotherapy 1 – 5?
    1 (Very unhelpful)- 2(unhelpful)-3(neutral)-4(helpful)-5(very unhelpful)
13. Are you currently taking medication for a psychological condition? Y/N
14. Have you ever taking medication for a psychological condition? Y/N
15. How helpful was (or is) taking medication 1 – 5?
    1 (Very unhelpful)- 2(unhelpful)-3(neutral)-4(helpful)-5(very unhelpful)
16. Are you or have you been diagnosed with depression by mental health or medical professional?

Center for Epidemiologic Studies – Depression Scale (Bohannon, Maljanian, & Goethe, 2003)

(1) rarely or none of the time (less than once a week)	(2)	(3)	(4) most or all of the time

17. I felt that I could not shake off the blues even with the help from my family or friends
18. I had trouble keeping my mind on what I was doing
19. I felt depressed
20. I felt everything I did was an effort
21. My sleep was restless
22. I enjoyed life
23. I felt sad

Depression Vignette (Time 1)

Read the following paragraph. As you read try to imagine that you were having the same experience as the character in the story.

For the past two weeks Alex has been feeling really down. Alex wakes up in the morning with a flat heavy feeling that sticks with him/her all day long. He/She isn't enjoying things the way he/she normally would. In fact nothing gives him/her pleasure. Even when good things happen, they don't seem to make Alex happy. He/She pushes on through his/her days, but it is really hard. The smallest tasks are difficult to accomplish. He/She

finds it hard to concentrate on anything. He/She feels out of energy and out of steam. And even though Alex feels tired, when night comes he/she can't go to sleep. Alex feels pretty worthless, and very discouraged. Alex family has noticed that he/she hasn't been himself/herself for about the last month and that he/she has pulled away from them. Alex just doesn't feel like talking.

As you answer the following remember to continue imagining that you were having Alex's experience.

The Brief Illness Perception Questionnaire (Broadbent et al., 2006)

24. If you were in Alex's situation, how much do you think this experience would affect your life?

0 No effect at all	1	2	3	4	5	6	7	8	9	10 Severely affects my life

25. If you were in Alex's situation, how long do you think this experience would continue?

0 A very short Time	1	2	3	4	5	6	7	8	9	10 Forever

26. If you were in Alex's situation, how much control do you think you would have over this experience?

0 Absolutely no control	1	2	3	4	5	6	7	8	9	10 Extreme amount of control

27. If you were in Alex's situation, how concerned would you be about having this experience?

0 Not at all concerned	1	2	3	4	5	6	7	8	9	10 Extremely concerned

28. If you were in Alex's situation, how much do you think this experience would affect you emotionally? (e.g., would it make you angry, scared, upset or depressed?)

0 Not at all affected emotionally	1	2	3	4	5	6	7	8	9	10 Extremely affected emotionally

Perceived Etiology of Depression Scale (Okumura & Sakamoto, 2012)

How important do you think these factors are causing Alex's experience:

0 not a cause	1 rarely a cause	2 undecided as a cause	3 likely to be a cause	4 a cause

29. Increase in workload (a)
30. Poor self-esteem (b)
31. Family history of depression (c)
32. Family breakdown (a)
33. Lack of willpower (b)

34. Hormone imbalance (c) [Edited]
35. Isolation (a)
36. Nervous temperament (b)
37. Chemical imbalance in the brain (c)
38. Unemployment (a)
39. Negative thoughts (b)
40. Impact of chronic physical illness (c)

Treatment Engagement
If you were in Alex's situation, how likely would you engage in the following treatments?

1 Extremely unlikely	2	3	4	5	6	7 Extremely likely

41. Psychotherapy (ex. psychologist, counselor, therapist)
42. Psychiatric Medication (ex. antidepressants, antianxiety, etc.)
43. Non-professional help (ex. talk to friends, family; exercise)

Expectancy Questionnaire: Psychotherapy (Devilly & Borkovec, 2000)
44. If you were in Alex's situation, how much improvement do you *think* will occur by the end of psychotherapy?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

For this set, close your eyes for a few moments, and try to identify what you really feel about psychotherapy and its likely success. Then answer the following questions.
45. If you were in Alex's situation, how much do you really *feel* that psychotherapy will help your experience?

1 not at all	2	3	4	5 somewhat	6	7	8	9 very much

46. If you were in Alex's situation, how much improvement do you really *feel* will occur by the end of psychotherapy?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Expectancy Questionnaire: Medication (Devilly & Borkovec, 2000)
47. If you were in Alex's situation, how much improvement do you *think* will occur by the end of psychiatric medication treatment?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

For this set, close your eyes for a few moments, and try to identify what you really feel about psychiatric medications and its likely success. Then answer the following questions.

48. If you were in Alex's situation, how much do you really *feel* that psychiatric medications will help your experience?

1 not at all	2	3	4	5 somewhat	6	7	8	9 very much

49. If you were in Alex's situation, how much improvement do you really *feel* will occur by the end of psychiatric medication treatment?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Treatment Seeking Self- Stigma

Psychotherapy

50. If I went to a psychotherapy, I would be less satisfied with myself.
51. I would feel inadequate if I went to a psychotherapy for psychological help.
52. It would make me feel inferior to ask a therapist for help.

Medication

53. If I took psychiatric medications, I would be less satisfied with myself.
54. I would feel inadequate if I took psychiatric medications for psychological help.
55. It would make me feel inferior to take psychiatric medications.

Doctor Vignette (Times 2)

Alex decides to go to the doctor to get help. The doctor enters the room and sits down to talk with Alex about what brought him/her in that day. Alex tells the doctor how they are feeling. The doctor listens carefully to what Alex is saying and seems interested and sympathetic. The doctor explains:

Biological Explanation Condition

It seems from your symptoms that you ***meet a diagnosis of major depressive disorder.*** Depression is a common medical illness that is no different from any other disease. Depressive illnesses are disorders of the brain**.** Longstanding theories about depression suggest that important neurotransmitters—chemicals that brain cells use to communicate—are out of balance in depression. The parts of the brain involved in mood, thinking, sleep, appetite, and behavior appear different. Brain-imaging technologies, such as magnetic resonance imaging (MRI), have shown that the brains of people who have depression look different than those of people without depression. But these images do not reveal why the depression has occurred and cannot be used to diagnose depression. Some types of depression tend to run in families suggesting that the disorder may be heritable. Scientists are studying certain genes that may make some people more prone to depression.

Psychosocial Explanation Condition

It seems from your symptoms that you ***meet a diagnosis of major depressive disorder.*** Depression is often a signal that certain mental, emotional and physical aspects of a person's life are out of balance. Significant transitions and major life stressors such as trauma, difficult relationships, death of a loved one, the loss of a job, and any stressful situation may cause depression. Moreover, continuous exposure to violence, neglect, abuse or poverty may make some people more vulnerable to depression. Other more subtle factors that lead to a loss of self-identity or self-esteem may also contribute.

People who are easily overwhelmed by stress, or who are generally pessimistic appear to be more likely to experience depression. Sometimes the circumstances involved in depression are ones over which an individual has little or no control. At other times, however, depression occurs when people are unable to see that they actually have choices and can bring about change in their lives.

Biopsychosocial Explanation Condition

It seems from your symptoms that you ***meet a diagnosis of major depressive disorder.*** Depression is often a signal that certain mental, emotional and physical aspects of a person's life are out of balance. Depression is caused by biological, psychological, social factors, and their interaction. Biological theories about depression suggest that important neurotransmitters—chemicals that brain cells use to communicate—are out of balance in depression. Brain-imaging technologies, such as magnetic resonance imaging (MRI), have shown that the brains of people who have depression look different than those of people without depression. The parts of the brain involved in mood, thinking, sleep, appetite, and behavior appear different. But these images do not reveal why the depression has occurred and cannot be used to diagnose depression. Some types of depression tend to run in families suggesting that the condition may be heritable. Moreover, significant transitions and major life stressors such as trauma, difficult relationships, death of a loved one, the loss of a job, and any stressful situation also may cause depression. Continuous exposure to violence, neglect, abuse or poverty may make some people more vulnerable to depression. Other more subtle factors that lead to a loss of self-identity or self-esteem may also contribute depression. People who are easily overwhelmed by stress, or who are generally pessimistic appear to be more likely to experience depression. Overall, some genetics research suggests that risk for depression results from the influence of several genes acting together with environmental or other factors. Sometimes the circumstances involved in depression are ones over which an individual has little or no control. At other times, however, depression occurs when people are unable to see that they actually have choices and can bring about change in their lives.

Control Condition

It seems from your symptoms that you ***meet a diagnosis of major depressive disorder.*** There are many competing theories about what causes depression. No one theory has been established that provides all the answers.

Taking into account Alex's condition and the doctor's explanation of *major depressive disorder* answer the following questions:

Expectancy Questionnaire: Psychotherapy (Devilly & Borkovec, 2000)

56. If you were in Alex's situation, how much improvement do you *think* will occur by the er psychotherapy?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100 %

For this set, close your eyes for a few moments, and try to identify what you really feel about psychotherapy and its likely success. Then answer the following questions.

57. If you were in Alex's situation, how much do you really *feel* that psychotherapy will help your experience?

1 not at all	2	3	4	5 somewhat	6	7	8	9 very much

58. If you were in Alex's situation, how much improvement do you really *feel* will occur by the end of psychotherapy?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Expectancy Questionnaire: Medication (Devilly & Borkovec, 2000)

59. If you were in Alex's situation, how much improvement do you *think* will occur by the er psychiatric medication treatment?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

For this set, close your eyes for a few moments, and try to identify what you really feel a psychotherapy and its likely success. Then answer the following questions.

60. If you were in Alex's situation, how much do you really *feel* that psychiatric medications your experience?

1 not at all	2	3	4	5 somewhat	6	7	8	9 very much

61. If you were in Alex's situation, how much improvement do you really *feel* will occur by psychiatric medication treatment?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Treatment Engagement

After hearing the doctor's explanation, how likely would you be to engage in the following treatments:

1 Extremely unlikely	2	3	4	5	6	7 Extremely likely

62. Psychotherapy (ex. psychologist, counselor, therapist)
63. Psychiatric Medication (ex. antidepressants, antianxiety, etc.)
64. Non-professional help (ex. talk to friends, family; exercise)

Perceived Etiology of Depression Scale (Okumura & Sakamoto, 2012)

After hearing the doctor's explanations, how important do you think these factors are at causing Alex's experience:

0 not a cause	1 rarely a cause	2 undecided as a cause	3 likely to be a cause	4 a cause

65. Increase in workload (a)
66. Poor self-esteem (b)
67. Family history of depression (c)

68. Family breakdown (a)
69. Lack of willpower (b)
70. Hormone imbalance (c) [Edited]
71. Isolation (a)
72. Nervous temperament (b)
73. Chemical imbalance in the brain (c)
74. Unemployment (a)
75. Negative thoughts (b)
76. Impact of chronic physical illness (c)

Treatment Seeking Self- Stigma

Psychotherapy

77. If I went to a psychotherapy, I would be less satisfied with myself.
78. I would feel inadequate if I went to a psychotherapy for psychological help.
79. It would make me feel inferior to ask a therapist for help.

Medication

80. If I took psychiatric medications, I would be less satisfied with myself.
81. I would feel inadequate if I took psychiatric medications for psychological help.
82. It would make me feel inferior to take psychiatric medications.

Treatment Recommendation: Psychotherapy and Medication

Several types of psychotherapy—or talk therapy—can help people. Psychotherapy is a collaborative treatment based on the relationship between an individual and a therapist. Grounded in dialogue, it provides you a supportive environment that allows you to talk openly with someone who's objective, neutral and nonjudgmental. You and your therapist will work together to identify and change the thought and behavior patterns that are keeping you from feeling your best. Psychotherapy will help you understand their condition, live happier, healthier and more productive lives. It helps people develop effective coping strategies and habits; it teaches people tools to deal with stress and unhealthy thoughts and behaviors. Psychotherapy helps patients manage their symptoms better and function at their best in everyday life. By the time you're done, you will have solved the problem that brought you in, and you will have learned new skills so you can better cope with whatever challenges arise in the future. There are many different approaches to psychotherapy.

Antidepressants will help your condition primarily works on brain chemicals called neurotransmitters, especially serotonin and norepinephrine. Other antidepressants work on the neurotransmitter dopamine. Scientists have found that these particular chemicals are involved in regulating mood, but they are unsure of the exact ways that they work. All antidepressants must be taken for at least 4 to 6 weeks before they have a full effect. You should continue to take the medication, even if you are feeling better, to prevent the depression from returning. Medication should be stopped only under a doctor's supervision. Some medications need to be gradually stopped to give the body time to adjust. Although antidepressants are not habit forming or addictive, suddenly ending an

antidepressant can cause withdrawal symptoms or lead to a relapse of the depression. Some individuals, such as those with chronic or recurrent depression, may need to stay on the medication indefinitely.

Expectancy Questionnaire: Psychotherapy (Devilly & Borkovec, 2000)

83. If you were in Alex's situation, how much improvement do you *think* will occur by the end of psychotherapy?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

For this set, close your eyes for a few moments, and try to identify what you really feel about psychotherapy and its likely success. Then answer the following questions.

84. If you were in Alex's situation, how much do you really *feel* that psychotherapy will help your experience?

1 not at all	2	3	4	5 somewhat	6	7	8	9 very much

85. If you were in Alex's situation, how much improvement do you really *feel* will occur By the end of psychotherapy?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Expectancy Questionnaire: Medication (Devilly & Borkovec, 2000)

86. If you were in Alex's situation, how much improvement do you *think* will occur by the end of psychiatric medication treatment?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

For this set, close your eyes for a few moments, and try to identify what you really feel about psychotherapy and its likely success. Then answer the following questions.

87. If you were in Alex's situation, how much do you really *feel* that psychiatric medications will help your experience?

1 not at all	2	3	4	5 somewhat	6	7	8	9 very much

88. If you were in Alex's situation, how much improvement do you really *feel* will occur by the end of psychiatric medication treatment?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Treatment Engagement

After hearing the doctor's explanation and treatment recommendations, how likely would you be to engage in the following treatments:

1 Extremely unlikely	2	3	4	5	6	7 Extremely likely

89. Psychotherapy (ex. psychologist, counselor, therapist)
90. Psychiatric Medication (ex. antidepressants, antianxiety, etc.)
91. Non-professional help (ex. talk to friends, family; exercise)

Treatment Seeking Self- Stigma

Psychotherapy

92. If I went to a psychotherapy, I would be less satisfied with myself.
93. I would feel inadequate if I went to a psychotherapy for psychological help.
94. It would make me feel inferior to ask a therapist for help.

Medication

95. If I took psychiatric medications, I would be less satisfied with myself.
96. I would feel inadequate if I took psychiatric medications for psychological help.
97. It would make me feel inferior to take psychiatric medications.

98. Do you think there are aspects of your cultural background that influences your beliefs about causes of mental illnesses? If so, please explain how this influence functions?

APPENDIX C

TWO-SIDED T-TESTS OF EQUIVALENCE TABLE

Table 10.
Two-Sided T-tests of Equivalence

Outcome Variable Compared to each condition	Mean Difference	Lower 90% CI	Upper 90% CI	*t*-value for Lower CI TOST	*t*-value for Upper CI TOST	*p*-value for lower TOST
Attending psychotherapy						
1 vs 2	0.16	-0.504	0.185	-48.727	47.196	< 0.0001
1 vs 3	0.172	-0.525	0.180	-47.655	46.039	< 0.0001
1 vs 4	0.195	-0.545	0.155	-48.080	46.242	< 0.0001
2 vs 3	0.013	-0.369	0.343	-46.419	46.300	< 0.0001
2 vs 4	0.035	-0.389	0.319	-46.830	46.500	< 0.0001
3 vs 4	0.022	-0.385	0.340	-45.700	45.495	< 0.0001
Taking Psychiatric Medications						
1 vs 2	0.278	-0.114	0.670	-40.971	43.314	< 0.0001
1 vs 3	-0.118	-0.506	0.270	-43.040	42.037	< 0.0001
1 vs 4	0.174	-0.201	0.550	-43.245	44.779	< 0.0001
2 vs 3	-0.396	-0.786	-0.006	-44.058	40.703	< 0.0001
2 vs 4	-0.104	-0.480	0.273	-44.331	43.419	< 0.0001
3 vs 4	0.292	-0.080	0.664	-43.088	45.681	< 0.0001
Non-Professional Help						
1 vs 2	-0.274	-0.666	0.117	-43.310	40.996	< 0.0001
1 vs 3	-0.401	-0.778	-0.023	-45.511	42.006	< 0.0001
1 vs 4	-0.445	-0.822	-0.067	-45.677	41.788	< 0.0001
2 vs 3	-0.126	-0.529	0.277	-41.476	40.444	< 0.0001
2 vs 4	-0.170	-0.573	0.233	-41.688	40.292	< 0.0001
3 vs 4	-0.044	-0.433	0.345	-42.680	42.304	< 0.0001
Positive Outcome Expectancies of Attending Psychotherapy						
1 vs 2	-0.130	-0.626	0.366	-33.730	32.866	< 0.0001
1 vs 3	0.221	-0.275	0.717	-32.566	34.037	< 0.0001
1 vs 4	-0.189	-0.658	0.280	-35.879	34.548	< 0.0001
2 vs 3	0.351	-0.167	0.868	-30.815	33.054	< 0.0001
2 vs 4	-0.059	-0.549	0.431	-33.900	33.501	< 0.0001
3 vs 4	-0.410	-0.900	0.080	-35.103	32.339	< 0.0001
Positive Outcome Expectancies of Taking Psychiatric Medications						
1 vs 2	-0.129	-0.545	0.287	-40.197	39.174	< 0.0001
1 vs 3	0.017	-0.416	0.451	-38.041	38.172	< 0.0001
1 vs 4	-0.135	-0.570	0.299	-38.536	37.509	< 0.0001
2 vs 3	0.146	-0.292	0.584	-37.147	38.249	< 0.0001
2 vs 4	-0.006	-0.446	0.433	-37.629	37.582	< 0.0001
3 vs 4	-0.152	-0.609	0.304	-36.745	35.642	< 0.0001
Self-Stigma for Attending Psychotherapy						
1 vs 2	0.080	-0.587	0.748	-24.557	24.955	< 0.0001
1 vs 3	0.244	-0.404	0.892	-24.862	26.106	< 0.0001
1 vs 4	-0.229	-0.943	0.486	-23.639	22.582	< 0.0001
2 vs 3	0.164	-0.506	0.834	-24.258	25.065	< 0.0001
2 vs 4	-0.309	-1.046	0.428	-23.122	21.735	< 0.0001
3 vs 4	-0.473	-1.193	0.247	-24.030	21.861	< 0.0001
Self-Stigma for Taking Medication						
1 vs 2	-0.421	-1.217	0.376	-21.616	19.871	< 0.0001
1 vs 3	0.235	-0.511	0.980	-21.629	22.668	< 0.0001
1 vs 4	0.002	-0.778	0.781	-21.186	21.194	< 0.0001
2 vs 3	0.655	-0.146	1.457	-19.263	21.964	< 0.0001
2 vs 4	0.422	-0.411	1.255	-18.995	20.671	< 0.0001
3 vs 4	-0.233	-1.017	0.551	-21.563	20.582	< 0.0001

Notes: 1 = Biological Condition, 2 = Psychosocial Condition, 3 = Biopsychosocial Condition, 4 = Control Condition

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