

THE MECHANISM OF CBT FOR DEPRESSION RECOVERY: THE ROLE OF  
PROBLEM-SOLVING APPRAISAL

By

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Presented to the Faculty of the Graduate School of  
The University of Texas at Arlington in Partial Fulfillment  
of the Requirements  
for the Degree of

DOCTOR OF PHILOSOPHY

THE UNIVERSITY OF TEXAS AT ARLINGTON

August 2008

## DEDICATION

To grandpa, my good friend Florence Bengs, and Lao-Su.

## ACKNOWLEDGEMENTS

I hope to express my sincere gratitude to my chair Dr. Cathleen Jordan for her kindly support in my research and graduation process while I faced many challenges to my health during my later doctoral years. My committee members: Dr. Donald Granvold, Dr. Norman Cobb, Dr. Maria Scannapieco, Dr. Peter Lehmann, and Dr. Dana Dunn, for their efforts in assisting me refining and completing my research. The Ph D. secretary, Rita Hay, for her support in helping me with my graduation process while I am away for treatments. Dr. Vijayan K. Pillai, Dr. Joan Rycraft, and the Scholarship committee, for their generosity in providing me financial support throughout my doctoral years, especially during my later doctoral years. Special thanks to the institutions that participated in this research. Finally, many thanks to Dallas, Lao-Su, my family and friends for their supports.

June 1, 2008

ABSTRACT

THE MECHANISM OF CBT FOR DEPRESSION RECOVERY: THE ROLE OF  
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Cognitive behavioral therapy (CBT) is among the most extensively tested psychotherapies for depression. Although its effect on depression alleviation has been widely recognized, little is known regarding its therapeutic mechanism on depression alleviation. Among empirical explanations about the mechanism of CBT, the cognitive mediation hypothesis has historically dominated the field. Although findings of prior studies support this hypothesis by showing a correlation between cognitive changes and depression changes, there is still an absence of sufficient evidence to support that patients' depression improvements are caused by their cognitive changes.

In recent years, several studies further observed that patients' depression was improved before their cognition changes taking place. These studies suggested that patients' depression improvement may be due to the interplay of certain therapeutic factors and patients' psychological factors. In light of these findings, the present study attempted to explore the mechanism of CBT through examining the role of patients' problem-solving appraisal in the therapy. Because problem-solving appraisal was found by prior studies to exhibit a stress buffering relationship with

depression, the present study suspected the existence of a stress moderating effect of problem-solving appraisal on depression alleviation in CBT.

A two group pretest and post test design was utilized. Interestingly, findings showed that the significant correlation between depression change and problem-solving change was only found in CBT group but not in the religious therapy group, whereas the stress moderating effect of problem-solving appraisal on depression was not found in CBT group. In sum, findings suggested that instead of moderating the negative influence of stress on depression, patients' problem-solving appraisal seemed to directly correlate with depression improvement in CBT. Furthermore, the significant relationship of problem solving appraisal and depression was only found in CBT group but was not found in a non cognitive behavioral treatment modality. As such, it can be inferred that the mechanism of problem-solving appraisal and depression alleviation exists specifically in CBT and is part of its therapeutic mechanism. Replications by future studies are called for.

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## CHAPTER 1

### INTRODUCTION

Cognitive behavioral therapy (CBT), defined as the approach utilizing cognitive and behavioral strategies to help individuals to think and act more realistically and adaptively about his psychological issues (Beck, Rush, Shaw, & Emery, 1979), is among the most extensively tested psychosocial treatments for depression (DeRubeis & Crits-Christoph, 1998). CBT is found to be as effective as well-administered pharmacotherapy as a treatment for depression; meta-analytic reviews even conclude CBT is to be at par with or slightly better than antidepressant medications in alleviating patients' depressive symptoms (Segal, Whitney, Lam, & CANMAT Depression Work Group, 2001). Although a number of contemporary studies have confirmed the efficacy of CBT as a treatment for depression (e.g., Segal et al., 2001), empirical findings are still in absence of a consistent explanation regarding the mechanism of CBT for depression alleviation (Oei & Free, 1995).

Among all empirical explanations about the mechanism of CBT, the cognitive mediation hypothesis has historically dominated the field (Tang, 2001). The cognitive mediation hypothesis stating that changing one's maladaptive cognitions is the central mechanism for individuals to recover from depression (Clark, Beck, & Alford, 1999; Tang, 2000). A number of studies have supported this hypothesis by showing that substantial cognitive changes is found to significantly correlate with individuals' depression changes during the course of CBT (e.g., DeRubeis, Evans, Hollon, Garvey, Grove, & Tuason, 1990). However, in recent years, some argue that most of current empirical evidences on cognitive mediation hypothesis are actually correlation in nature, thus such evidences offer weak support for the cognitive mediation hypothesis (Tang, 2000). Furthermore, several studies of contradictory findings also raised questions regarding the validity of this hypothesis (e.g., Ilardi & Craighead, 1994). Based on these facts, I consider that the

mechanism of CBT on depression alleviation is in need of further exploration. The present paper will begin by reviewing the theoretical and empirical bases of the mechanism of CBT. Based on the literature, I will introduce my research question, design and findings that were created for the purpose of advancing current knowledge about the depression alleviation mechanism in CBT.

### 1.1 Theoretical Hypothesis for the Mechanism of CBT

In the original cognitive framework of depression treatment, Beck (1964) posited that individuals' depressed mood is primarily influenced by their viewpoints toward the situation rather than the situation per se. In brief, Beck's theory hypothesized that it is the negative cognitive/thinking patterns that lead to the symptoms of depression (Beck, 1967). Several important concepts featured in this cognitive model of depression, include: (1). Cognitive triad: the theory postulated that depressives are characterized by a triad of negative cognitions about themselves, the world, and the future. Thus, depressives are prone to see themselves as inadequate, the environment as not reinforcing, and the future as devoid of hope (Beck, 1967). (2). Cognitive schemas: cognitive schemas are individuals' perceptions, beliefs, and basic assumptions about themselves and the world, which greatly influence their processing of information (Beck & Weishaar, 2000). The theory postulated that depressives are prone to exhibit negative cognitive schemas, thus, resulting in their negative viewpoints toward themselves and the world (Beck, et al., 1979). (3). Cognitive errors (distortions): cognitive errors are the systematic errors in reasoning, which are evident during psychological distress (Beck, 1967). The theory postulated that depressives are prone to exhibit cognitive errors (distortions), such as: arbitrary inference, selective abstraction, over generalization, magnification and minimization, personalization, and dichotomous thinking (Beck & Weishaar, 2000). (4). Automatic thoughts: the theory postulated that individuals' cognitions could be differentiated into individuals' core beliefs, intermediate beliefs and automatic thoughts (Beck, 2003). The core beliefs are regarded by the individual as absolute truths. It is developed since the individual's childhood, involving the individual's beliefs about what things should be like (Beck, 2003). The core beliefs generate the individual's intermediate beliefs which are individual's attitudes, rules, and assumptions (Beck,

2003). The automatic thoughts are the product of intermediate beliefs, which are the individual's ways of thinking (Beck, 2003). The theory postulated that to intervene with depression, the emphasis should be placed upon helping depressed individuals to identify their automatic thoughts. After the automatic thoughts are identified, the focus will be placed on modifying the individual's underlying dysfunctional attitudes, then the core beliefs (Beck, 2003).

In practice, CBT employs an array of cognitive and behavioral methods and procedures. The cognitive technique encompasses a didactic approach to explain to depressives about their automatic thoughts and how these thoughts affect their emotions and behaviors (Sands, 2001). The cognitive techniques of CBT help depressives: identifying how automatic thoughts affect their emotions and behaviors, discussing about cognitive errors, identifying their interpretation of events, guiding them to generate alternative explanations, hypothesizing the rationale for their current behaviors, and empirically examining their underlying hypotheses (Sands, 2001). The behavioral methods of CBT usually involve the use of activity schedules, graded task assignments, role-play, cognitive rehearsal, and diversion techniques. It is assumed that through doing behavioral exercises, patients will be able to acquire new behaviors (Beck et al., 1979). Although the behavioral approaches are often incorporated in CBT practice; Beck's theory postulated that the primary depression alleviation mechanism is based on interventions focusing on modifying depressives' cognitive structure or core schemas (Beck et al., 1979).

## 1.2 Empirical Findings for the Mechanism of CBT

### *1.2.1 Empirical Evidence for Cognitive Theory*

To endorse the validity of Beck's cognitive mediation hypothesis, a number of studies had been conducted to support the significant correlation between the cognitive variables and depression in CBT. A common approach adopted by these studies was to administer the cognitive measures in research to see whether the scores of the cognitive measures are correlated with patients' improved depression.

A typical example is the approach adopted by DeRubeis, Evans, Hollon, Garvey, Grove, and Tuason (1990). In this study, DeRubeis et al. administered the depression measure along with

common cognitive measures including: the Attributional Styles Questionnaire (ASQ; Seligman, Abramson, Semmel, & von Baeyer, 1979), the Automatic Thoughts Questionnaire (ATQ; Hollon & Kendall, 1980) and the Dysfunctional Attitude Scale (DAS; Weissman & Beck, 1978), at beginning, middle, and end of the 12 week treatment period to the cognitive therapy group and pharmacotherapy only group. In this study, DeRubeis et al. found change from pretreatment to midtreatment on the ASQ and DAS predicted change in depression from midtreatment to posttreatment, thus they suggested the possibility that cognitive variables might play a mediating role for depression change in the cognitive therapy.

Another example is Oei and Sullivan's (1999) study. In this study, Oei and Sullivan used an end-of-therapy cut off score of 10 on the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) as the definition of depression recovery and discovered that patients' ATQ score was significantly lower for the recovered group as compared to the non-recovered group. Oei and Sullivan also found that the recovered group showed a faster rate of improvement on the DAS scores as compared to the non-recovered group, after the middle phase of CBT.

In fact, the significant relationship between the changed cognitions and depression alleviation in CBT had been identified by early review articles (e.g., Oei & Free, 1995). For instance, Oei and Free investigated the relationship between the changed cognitions and depression improvement in several psychotherapy studies between 1970 and 1990 (including CBT). Their findings confirmed the presence of a statistically significant relationship between individuals' cognitive changes and depression change during the process of CBT, with most studies included in this review adopted cognitive measures such as DAS and ATQ.

Although in the past years, a number of studies had emerged to support the significant correlation between individuals' changed cognitions and depression alleviation in CBT (e.g., DeRubeis, Evans, Hollon, Garvey, Grove, & Tuason, 1990; DeRubeis & Feeley, 1990; Oei & Free, 1995; Oei & Sullivan, 1999), these studies are recently being critiqued for their correlation nature and the insufficiency of strong evidence for the cognitive mediation hypothesis. Tang (2000) commented that the findings of these correlation studies are vulnerable to two types of alternative

explanations: (1) Reverse causation: it could be the improved depression that triggers the cognitive change. (2) Third variables: it could be other factors that are associated with the changed cognition and depression, and produce depression change in CBT.

Among these correlation studies, one particular study that deserves to be mentioned is Tang and DeRubeis' (1999) study; as they discovered an interesting phenomenon during the course of CBT. Tang and DeRubeis' finding caused quite a stir among CBT researchers, and it was also evaluated and commented in many research articles. Tang and DeRubeis' study carefully analyzed the time course of the therapeutic change in CBT with the control of many therapeutic variables. They observed that during the course of CBT, a number of patients experienced a sudden improvement of depression (11 Beck Depression Inventory points) in a single between-sessions interval, and they named this phenomenon as "sudden gains". Specifically, they found that during the pregain session (the therapeutic session immediately preceding sudden gains) and control session (the session right before the pregain session), no significant differences were shown on many therapeutic variables such as: therapists' adherence to CBT techniques, therapeutic alliance, facilitative conditions, and therapists' competence. However, they did find that patients demonstrated substantial cognitive changes in the pregain session but very few cognitive changes in the control session. Thus, concluded from their finding, Tang and DeRubeis considered that in-session cognitive changes might contribute to patients' "sudden gains" in CBT.

In light of the finding, Tang and DeRubeis proposed a three stages model to depict the therapeutic process of CBT: (1) Preparation stage: at the beginning of therapy, the cognitive model and basic cognitive techniques were introduced. This has involved with little cognitive changes and minor symptom improvements and set the foundation for future improvements. (2) Critical session/sudden gains: patients have critical core belief changes and schema change, which lead to a large decrease of depression symptoms. (3) Upward spiral: the sudden gains lead to the improvement of therapeutic alliance and mood and also serve as the foundation for additional cognitive changes; the continuing process will lead to recovery.

Although Tang and DeRubeis' finding was replicated by another study (Tang, DeRubeis,

Beberman, & Pham, 2005), interestingly, some studies further found that sudden gains phenomenon is not specific to CBT, as it also existed in therapies of different emphasis, such as supportive-expressive (SE) therapy (See Tang, Luborsky, & Andrusyna, 2002). According to Tang et al. (2002), sudden gains in SE therapy showed similar magnitude, affected a similar percentage of patients and occurred at similar timing as sudden gains in CBT. Similarly, Gaynor, Weersing, Kolko, Brimaher, Heo, and Brent (2003) discovered that the nondirective supportive therapy (NST) demonstrated similar magnitude of sudden gains as the CBT. So as Vittengl, Clark, and Jarrett (2005) examined sudden gains phenomenon among non-psychotherapy groups and found that sudden gains phenomenon also showed in pill placebo and pharmacotherapy groups. Additionally, Vittengl et al. found that the cognitive therapy group did not significantly differ from pill placebo and pharmacotherapy groups on the percentage of patients who experienced sudden gains.

In all, findings of prior CBT studies revealed the absence of strong evidence to support Beck's cognitive model of depression treatment. Although these studies did show a substantial correlation between individuals' cognitive change and depression change, and some studies even indicated that cognitive change precedes depression change thus suggested the possibility of the causal relationship between these two variables (e.g., Tang & DeRubeis, 1999; Tang, et al. 2005). However, all these findings were really correlation in nature. As Tang et al. (2005) commented that since many variables which could explain depression alleviation were not examined in the correlation studies, the existence of alternative depression alleviation mechanisms in CBT remain possible.

### *1.2.2 The Behavioral Model of CBT*

In addition to Beck's cognitive model, the other important model that was frequently discussed in the literature is the behavioral model.

Different from the cognitive mediation hypothesis, the behavioral/behavioral activation model hypothesized that it is the behavioral activation component in CBT that plays a crucial role for depression alleviation. The behavioral activation model was introduced by Jacobson, Dobson, Truax, Addis, Koerner, Gollan, Gortner, and Prince (1996). In their influential article, Jacobson et al.

examined the mechanism of CBT through decomposing CBT into behavioral and cognitive parts. In this study, Jacobson and colleagues (1996) randomly assigned depressed patients to a behavioral activation (BA) only group, a group that was composed of both modification of automatic dysfunctional thinking (AT) and BA, and a CBT group. They speculated that if the assumption of cognitive theory is accurate (cognitive change is the primary mechanism for depression alleviation), the treatment effect should be greater for treatments that contained the cognitive change techniques, such as CBT (full package) and AT. Interestingly, Jacobson et al. (1996) found CBT was as effective as BA and AT in alleviating patients' depression. This finding suggests the possibility that it could be the behavioral activation component rather than the cognitive component that plays a crucial part in CBT for depression alleviation.

A similar research design was replicated by Gortner, Gollan, Dobson, and Jacobson (1998). Gortner et al. randomly assigned 151 depressed outpatients to three groups (CBT, BA, AT). They also found that three groups demonstrated non-significant outcome differences. In general, these two studies called into question the theory that the cognitive change technique is the primary part of CBT for depression alleviation. Although further evaluations are needed to support this behavioral model of CBT, the findings of Jacobson et al. advance the empirical CBT literature with the proposition that the behavioral component could be the crucial part of the CBT for depression alleviation (Hollon, 2000).

### *1.2.3 The Nonspecific Factors Model*

In addition to the cognitive model and the behavioral model, another important model that has been discussed in the literature is the nonspecific factors model. The nonspecific factors model was proposed during the 1980s, as it was argued by some researchers that the treatment package of CBT tends to rely heavily on techniques that are not specific to the cognitive theory, such as: high treatment structure, active engagement of therapist and patient, and a collaborative therapeutic relationship (Fennell, 1983). Later on, Ilardi and Craighead (1994) conducted an important review and concluded from their findings that the mechanism of CBT on depression alleviation could be through these nonspecific factors (therapeutic factors that are not specific to

CBT) in the psychotherapies.

In this influential review study, Ilardi and Craighead (1994) analyzed the time course of a series of CBT outcome studies. They observed that, in many studies, the majority of symptom improvement in CBT occurs prior to the introduction of the cognitive change techniques. Ilardi and Craighead also observed that, in many studies, patients' depression improvement seemed largely influenced by factors that are common to many psychotherapies (the nonspecific factors), such as therapeutic relationships, the setting, therapeutic rationales, and treatment procedures. Thus, in light of these findings, Ilardi and Craighead proposed that the mechanism of CBT in depression alleviation might not be through patients' cognitive change (as what is specified by the cognitive theory). They further suggested that nonspecific factors in CBT might play a crucial role in alleviating depressive symptoms by combating patients' feelings of demoralization and catalyzing a process of remoralization. For instance, they suggested that listening to the therapist outlining a plausible treatment plan may trigger patients to increase positive expectancy for recovery. Patients' improved morale could in turn promote their depression improvement. Based on the findings of prior studies, Ilardi and Craighead (1994) proposed a three-phase model for the mechanism of CBT: (1) in the first two weeks of CBT, nonspecific factors might play a role in combating patient's hopelessness; (2) after that, the occurrence of patients' remoralization causes patients' early rapid reduction of depression; (3) in later sessions of CBT, patients begin to acquire specific CBT skills which helps them to combat future depression relapse.

Ilardi and Craighead's theory was supported by a series of studies showing that nonspecific factors such as homework (Burns & Nolen-Hoekesema, 1991; Burns & Spangler, 2000) and therapeutic empathy (Burns & Nolen-Hoekesema, 1992) are able to predict patients' depression improvement in CBT. Particularly, Wilson (1999) further proposed that behavioral homework and self-monitoring processes are two nonspecific factors that play an important role in explaining patients' rapid response to CBT. In all, although the non-specific factor model of depression alleviation has not been verified, Ilardi and Craighead's work advances current knowledge about CBT by showing that nonspecific factors could play a pivotal part in the early phase of CBT in

combating factors relating to patients' depression alleviation.

#### *1.2.4 To Bridge the Gap of Prior Studies*

Although several models have been proposed to depict the mechanism of CBT for depression alleviation, due to the absence of rigorous research design and replicated outcomes, the mechanism of CBT on depression alleviation remains unclear. Moreover, prior CBT studies had overemphasized on examining therapeutic variables (e.g., cognitive/behavioral modification techniques) and there was a lack of attention to the role of individuals' psychological variables in the depression recovery process.

Tang (2000) commented on cognitive theory: While the occurrence of cognitive change and symptom alleviation are predicted during the process of CBT, the theory is vague about why and how these changes will occur. The present study suggests that the examination of the change of individuals' psychological factors could help us to understand more clearly about the depression alleviation course of CBT. Furthermore, the importance of individuals' psychological factors has been recognized by the nonspecific factor model, as Ilardi and Craighead (1994) proposed that the primary effect of therapeutic variables (e.g., nonspecific factors) on depression alleviation takes place through catalyzing individuals' psychological factors (e.g., remoralization). Thus, the present study considers that it is necessary to take into account the influence of individuals' psychological variables while exploring the mechanism of CBT.

The present study suspects that one psychological variable, individuals' problem-solving appraisal, is particularly important in explaining about patients' depression recovery in CBT. This important psychological factor has constantly been omitted in studying the mechanism of CBT for depression alleviation, but was discovered by prior studies to demonstrate an important relationship with depression development. The next section of this paper will discuss the substantial relationship between individuals' problem-solving appraisal and CBT. It is believed that the inclusion of problem-solving appraisal would advance current understanding of the process of CBT for depression alleviation.

### 1.3 Problem-solving Appraisal

Problem-solving appraisal is defined as one's perceptions of his problem-solving ability (Heppner & Petersen, 1982), which also refers to the concept measured by Heppner and Petersons' (1982) Problem Solving Inventory (PSI). Prior research had shown that PSI is associated with a variety of psychological variables particularly with depression (Dixon, 2000). The PSI comprises three subscales based on factor analysis, including: problem-solving confidence, approach avoidance style, and personal control (Heppner & Petersen, 1982).

According to Heppner, Witty, & Dixon (2004), the concept of problem-solving confidence directly relates to the concept of self-efficacy (Bandura, 1986), and the concept of the approach avoidance style is about the individual's general tendency to approach or avoid the problem while solving problems, the concept of the personal control is about one's expectancies of their emotional regulation during problem solving. Putting it all together, the combination of three concepts can be conceptualized as a general set of beliefs about one's problem-solving ability (Heppner & Petersen, 1982).

#### *1.3.1 Problem-solving Appraisal and Depression*

One of the most famous theories that relates to the relationship between individuals' problem-solving appraisal and depression is Bandura's (1982) theory of individuals' self-efficacy and effective coping. According to Bandura (1986), perceived self-efficacy is defined as an individual's beliefs in his capability to perform a specific action required to attain a desired outcome and is able to influence one's thought patterns, actions, and emotional arousal. Specifically, it was believed that higher level of induced self-efficacy is associated with higher performance accomplishments and lower emotional arousal (Bandura, 1982). Thus, inferring from Bandura's idea, the higher the individuals' self-appraised efficacy, the lower their level of depressed mood should be.

Based on findings of prior studies, Billings and Moos (1982) proposed a more complex model to depict the relationship between individual's self-appraisal and depressive moods. According to Billings and Moos, depression is an outcome derived from the interplay of personal

and environmental resources, environmental stressors, and the individual's self-appraisal and coping with stressful events. More specifically, Billings and Moos proposed that individuals' self-appraisal would mediate the relationship of environmental stressors and depression so that an effective self-appraisal could reduce the level of perceived stress and break the chain of depression development (Billings & Moos, 1982).

Both Bandura and Billings and Moos' models highlighted the important role of individuals' self-appraisal on influencing depression. In their opinions, a positive self-appraisal seems to play an important role in boosting ones' resilience for depression development. Therefore, in light of these models, it is reasonable to speculate that individuals' specific self-appraisal, such as, individuals' problem-solving appraisal, could play an important part in individuals' depression development.

Consistent with this speculation, a number of empirical studies were found to support the relation of problem-solving appraisal and depression. Empirical evidence indicated that problem-solving appraisal, as measured by Heppner and Petersen's (1982) Problem Solving Inventory, demonstrates a significant correlation relationship with depression (e.g., Dixon, 1992). This significant relationship was supported by a number of studies showing that individuals who perceived themselves as ineffective problem-solvers are more likely to suffer from higher level of depression (e.g., Heppner, Baumgardner, & Jackson, 1985; Nezu & Perri, 1989; Blankstein, Flett, & Johnston, 1992; Dixon, 2000). Although empirical studies have not reached a definite conclusion regarding the relationship between one's problem-solving appraisal and depression, current studies have mostly documented two explanations.

One common explanation is similar to Billings and Moos' (1982) model, suggesting that one's problem-solving appraisal is able to influence the relationship between stress and depression (Nezu, 1985; Nezu & Ronan, 1985; Nezu, Nezu, Saraydarian, Kalmar, & Ronan, 1986; Nezu & Ronan, 1988; Cheng, 2001). Specifically, some researchers found that problem-solving appraisal moderated the negative effect of stress with regard to the risk of experiencing depressive symptoms, so that individuals with positive problem-solving appraisal were found to report less

depressive symptoms than individuals with negative problem-solving appraisal (Nezu et al., 1986; Nezu & Ronan, 1988). This finding also replicated in different cultures, for example, based on a sample of 138 Chinese students, Cheng (2001) discovered that individual's problem-solving appraisal interacted with levels of life stress in predicting individual's depression scores so that ineffective problem-solvers demonstrated significantly greater levels of depression under the situation of high life stress.

In addition to the stress-buffering relationship, the other empirical explanation for the relationship between problem-solving appraisal and depression was documented on their reciprocal relationship (Dixon, Heppner, Burnett, Anderson, & Wood, 1993; Dixon, 2000). Several studies discovered that while problem-solving appraisal seemed to play a role in buffering the development of depression, depression itself also seemed to cause a temporal deficit in ones' problem-solving appraisal (Dixon et al., 1993; Dixon, 2000). For instance, Dixon (2000) discovered that self-appraised effective problem solvers are more able to recover from depression than self-appraised ineffective problem solvers. On the other hand, Dixon et al. (1993) used a structural equation model to distinguish among the antecedents, concomitants, and consequences of problem-solving appraisal and depression. Consistent with prior studies (e.g., Nezu & Ronan, 1988), Dixon et al's finding showed that ineffective problem-solving appraisal is an antecedent of depression; interestingly, they also found that ineffective problem-solving appraisal is a concomitant of depressive symptoms. This finding revealed that while current depressive symptoms can lead to temporal ineffective problem-solving, past depressive symptoms are not able to scar a person and cause permanent ineffective problem-solving (Dixon et al., 1993). Hence, findings of Dixon et al's study provided the evidence to suggest that problem-solving appraisal is both a cause (antecedent) and a symptom (concomitant) of depression. Concluded from findings of Dixon (2000) and Dixon et al. (1993), it seemed that while effective problem-solving could assist individuals to recover from depression, depression itself could also cause one's temporal ineffective problem-solving appraisal.

In general, three main points can be concluded from the literature: (1) Problem-solving

appraisal and depression are significantly correlated; (2) Better problem-solving appraisal seems to significantly correlate with lower level of depression via buffering the negative effect of stress. (3) While effective problem-solving appraisal seems to assist one to recovery from depression, depression itself also seems to cause one's temporal deficits in their self-appraised problem-solving ability.

### *1.3.2 Problem-solving Appraisal and CBT*

In addition to a significant relationship with depression, from both theoretical and empirical perspectives, problem-solving appraisal also shows a substantial relationship with cognitive behavioral therapy.

First, from a theoretical perspective, problem-solving components are embedded in CBT. Problem-solving strategies are constantly incorporated in Beck's cognitive therapy model of depression treatment for the purpose of optimally changing depressive's cognitive distortion (Nezu, Nezu, Trunzo, & McClure, 1998). A good example is that, during CBT, depressed patients are encouraged to make a list of what he or she needs to do then break the large tasks into small steps. After that patients are encouraged to run an experiment to see if they can accomplish the task one step at a time. Although the primary purpose of this intervention is to use patients' successful experiences to disconfirm their cognitive distortions, such concrete behavioral assignments allow patients to gain better problem-solving skills throughout the therapy process (Hollon, Haman, & Brown, 2002). Patients' experience of success in completing these tasks may in turn make them aware of their improved problem-solving abilities. Hence, it is reasonable to speculate that patients' problem-solving appraisal also could be enhanced after the CBT.

Second, from the viewpoint of the cognitive model of depression, individuals' ineffective problem-solving appraisal can be seen as a demonstration of the depressive thinking style. In the original cognitive theory, Beck's cognitive model of depression postulates that depressed individuals are characterized by a negative cognitive triad including: having negative viewpoints toward themselves, their environment, and their future (Beck, 1967) Thus inferring from Beck's theory, individuals' negative problem-solving appraisal can be seen as the demonstration of their

negative viewpoints of themselves. Furthermore, it is also known that the primary emphasis of CBT is to modify these negative cognitions/thinking styles (Beck et al., 1979), thus it is reasonable to speculate that patients' problem-solving appraisal could be enhanced after receiving CBT.

Third, from an empirical perspective, problem-solving and similar psychosocial constructs (e.g., learned resourcefulness) were found as important correlates for depression improvement during CBT. Empirical studies have shown that problem-solving or similar psychosocial constructs (e.g., learned resourcefulness) have a significant correlation with patients' depression recovery in CBT (Burns, Rude, Simons, Bates, & Thase, 1994; Feehan & Vostanis, 1996; Moorey, Holting, Houghes, Knyenbergh, & Michael, 2001). For instance, based on a sample of 57 children and adolescents, Feehan and Vostanis (1996) studied the impact of the CBT elements from the subjects' report. They found that the majority of CBT elements identified by depressed children are associated with problem-solving, thus Feehan and Vostanis concluded problem-solving to be an important element in CBT.

Furthermore, several studies found that similar psychosocial constructs such as learned resourcefulness to be important predictors for depression recovery in CBT. The concept of learned resourcefulness represents self observation of a set of coping behaviors connected with problem-solving, emotional self-regulation and self-efficacy (Moorey et al., 2001), therefore it is a similar psychosocial construct for one's problem-solving appraisal.

The concept of learned resourcefulness is measured by the Self Control Scale (SCS; Rosenbaum, 1980; Rosenbaum & Jaffe, 1983) and has been utilized in a series of studies as a predictor of response to CBT. Among these studies, Burns et al. (1994) found that individuals of better perceived learned resourcefulness demonstrated better depression improvement in CBT. Similarly, Moorey et al. (2001) utilized a shorten version of the SCS designed for measuring individuals' application of self control methods to the solution of behavioral problems (the Problem Solving Scale; Centre for Cognitive Therapy, 1988) to predict the outcome of 65 patients receiving CBT. They also found that poor problem solving (lower scores on the Problem Solving Scale) was associated with poorer outcome for depressed patients receiving CBT but not for patients with

anxiety disorder or other disorders. Thus, inferring from the findings of prior studies, the substantial correlation among problem-solving (problem solving component in CBT or patients' self-observation of problem solving behavior), depression, and CBT seemed to exist.

In sum, both theoretical and empirical literature reveals that depressed individuals' problem-solving appraisal seems to show a substantial relationship with their responses to cognitive behavioral therapy. Hence, the present study seeks to explore the role of individuals' problem-solving appraisal when exploring the mechanism of CBT for depression alleviation.

#### 1.4 Implications of Prior Studies and the Aim of the Present Study

In general, current literature reveals an absence of sufficient knowledge regarding the mechanism of CBT for depression alleviation. Although the original cognitive theory had suggested that changing patients' cognition is the key to depression improvement (Beck et al., 1979), and this theory had been supported by a number of studies indicating the significant correlation between patients' changed cognition and depression, due to the absence of rigorous research design and the control of the third variables, findings of current research still lacks strong evidence to support this cognitive model of depression (Tang, 2000).

In recent years, findings of several studies have shown the possibility of the existence of alternative treatment mechanisms for CBT. For instance, Ilardi and Craighead (1994) discovered that, in many CBT studies, patients' depression improvements occurred during the time when the primary cognitive change techniques were not introduced. Hence, they proposed that nonspecific factors (factors that are common to many psychotherapies), such as: therapeutic relationships, the setting, therapeutic rationales, and treatment procedures, might be the actual causes for patients' depression improvement in CBT.

Moreover, some studies suggested a behavioral model to be the key mechanism of CBT as it was discovered by some studies that the behavioral activation strategies were as effective as the cognition change strategies in improving patients' depression. In light of this fact, Jacobson et al. (1996) proposed that it could be the behavioral activation component but not the cognitive modification component that serves as the key for depression alleviation in CBT.

In sum, literature reveals that a number of CBT studies had mostly focused on examining therapeutic variables (cognitive, behavioral, nonspecific therapeutic parts of CBT). Little attention has been placed on exploring individual's psychological factors. The primary effect of therapeutic variables (e.g., nonspecific factors) on depression alleviation could be caused from its interplay with individuals' psychological factors (Ilardi & Craighead, 1994). Therefore, the present study considers it is important to include the examination of individual's psychological factors in exploration of the mechanism of CBT for depression alleviation.

The present study suspects that a substantive part of the effect of CBT for depression alleviation might be caused from the involvement of an important psychosocial factor, individuals' problem-solving appraisal. As the literature suggested, ones' problem-solving appraisal could buffer the negative effect of stress and reduce the risk for depression development (Nezu, 1985; Nezu & Ronan, 1985; Nezu, Nezu, Saraydarian, Kalmar, & Ronan, 1986; Nezu & Ronan, 1988; Cheng, 2001). It was also found that higher problem-solving appraisal is associated with greater depression improvement (Nezu et al., 1986; Nezu & Ronan, 1988).

Moreover, problem-solving appraisal has been found to show a substantial relationship with CBT. From theoretical perspective, the problem-solving components are embedded in CBT so that patients' problem solving ability could be improved after CBT as well as their appraised problem-solving ability (Nezu et al., 1998). Furthermore, one's negative problem-solving appraisal can also be seen as a type of negative cognition, and because the aim of CBT is to modify patients' negative cognition, patients' problem-solving appraisal can be expected to improve after receiving the CBT. Finally, a number of studies also discovered that problem-solving and similar psychosocial constructs were important treatment correlates to CBT (Burns, Rude, Simons, Bates, & Thase, 1994; Feehan & Vostanis, 1996; Moorey, Holting, Houghes, Knyenber, & Michael, 2001). Thus, concluding from the literature, it is reasonable to speculate that patients' problem-solving appraisal may play an important role in assisting patients' depression recovery during CBT.

In general, the present study aims to advance current knowledge of CBT by including the

examination of one's problem-solving appraisal in the therapeutic process of CBT. In light of its stress-buffering effect that has been indicated in the literature, the role of one's problem-solving appraisal in CBT is speculated as follows: patients gain their problem-solving appraisal improvement during the process of CBT, and because their problem-solving appraisals are improved, their perceived stress will reduce, and because the stress is reduced, patients' depression will improve. Additionally, I considered that if problem-solving appraisal can be found to explain a meaningful part of patients' depression improvement in CBT, future studies can continue to explore whether the link between patients' problem-solving appraisal and therapeutic components could explain why many therapeutic variables (e.g., behavioral activation or nonspecific factors) were all found to improve a similar magnitude of depression in CBT. Moreover, if the mechanism of problem solving appraisal can be verified, depression treatment can be released from the original CBT modality. Compact treatment modalities that target improving patients' problem-solving appraisal can be initiated to help social workers to work with patients/clients more efficiently.

In conclusion, the present study aims to initially include the examination of individuals' problem-solving appraisal to explore the mechanism of CBT with the utilization of the two-group pretest and posttest design. Because little has been known about how CBT achieves its effect, so as the role of individuals' problem-solving appraisal in the process of CBT; it is expected that with the examination of individuals' problem-solving appraisal, findings of the present study could provide a new perspective to understand the mechanism of CBT for depression alleviation.

## CHAPTER 2

### RESEARCH DESCRIPTIONS

#### 2.1 General Research Question and Hypotheses

The present study comprises a general research question, which is: Does the therapeutic mechanism of CBT for depression alleviation involve with the influence of the change of individuals' problem-solving appraisal during the therapy? There are four primary hypotheses of the present study, including: (1) Participants' problem-solving appraisal and their depression will be significantly improved after receiving CBT; (2) Participants who receive CBT will demonstrate more improvement on problem-solving appraisal and depression compared to individuals who receive a different kind of psychotherapy. (3) Participant's problem-solving appraisal will influence their depression improvement in CBT group. (4) Participants' problem-solving appraisal will buffer the negative impact of stress on influencing individuals' depressed mood in CBT group.

#### 2.2 Method

##### *2.2.1 Participants*

The present study comprises two research groups. Participants of two groups will be statistically examined on their demographic characteristics, diagnosis, and medication conditions. The first research group is composed of thirty adults who seek CBT service for their depression from a psychiatric outpatient program. The research data of this group is the secondary data which was previously collected from an outpatient program in Arlington, Texas. The second research group is composed of thirty adults who seek religious therapy for their depression from a Taiwanese Buddhist Institution. The research data of the religious therapy group is also the secondary data which was collected by the institution. All research participants gave their written consents before enrolling in this study. Participants met criteria for major depressive disorder in the *Diagnostic and Statistical Manual of Mental Disorders* (4<sup>th</sup> edition; American Psychiatric

Association, 1994). Individuals who have a diagnosis of any psychotic disorder are excluded from this study. An estimation of sample size needed for each research group is presented in Table 1.

Table 1 Estimation of Sample Size

	Statistics	Effect Size	Each Group Number
Hypothesis 1	Paired <i>t</i>	<i>d</i> = 0.8	12
Hypothesis 2	Independent <i>t</i>	<i>d</i> = 0.8	21
Hypothesis 3	<i>r</i>	<i>q</i> = 0.5	53
	<i>F</i>	<i>f</i> = 0.4	12
Hypothesis 4	<i>F</i>	<i>f</i> = 0.4	21

Note. When  $\alpha=0.05$ , power=0.8

### 2.2.2 Procedure/Design

The present study had obtained the approval of the Institutional Review Board of the University of Texas at Arlington. Only individuals who give their written consents were recruited in this study as participants. The present study adopted a two group pretest and posttest design. Two groups of individuals receiving different psychotherapy services are compared. To ensure groups' comparability, participants of each research group will be statistically examined on their demographic characteristics (Rubin & Babbie, 2001). Two research instruments were distributed to the participants before and after they receive the psychotherapy intervention.

Internal Validity (Rubin & Babbie, 2001). To ensure the internal validity of the research design, in addition to the research group of interest (CBT group), the present study will adopt a second research group to compare participants' depression and problem solving appraisal conditions. Participants' responses on the research instruments are compared across two groups to explore whether participants' improvements on depression and problem-solving appraisal only occur in the CBT group but not in the other research group. Two research groups also are statistically examined on demographic characteristics to ensure groups' comparability. Threats to internal validity of this study are further discussed in the limitation section.

External validity (Rubin & Babbie, 2001). Due to the fact that the research sample was

recruited from an outpatient treatment program, findings of the present study can only be generalized to similar clinical environments. Threats to external validity of this study are included in the limitation section.

### *2.2.3 Intervention/Settings*

#### *2.2.3.1 Cognitive behavioral therapy (CBT)*

The CBT intervention is provided by an Intensive Outpatient Program of a mid-size hospital in North Texas and is delivered to research participants in group format, two and a half hours per day every weekday. The intervention is provided by two therapists who possess a Master social worker license.

The CBT intervention is composed of two parts. The first hour of the intervention emphasizes teaching patients cognitive behavioral skills. The therapist provides a CBT skill lecture with the use of lecture handouts to patients. Themes taught in the skill group include: cognitive distortion, mistaken beliefs, negative self-talk, and anxiety control, which targets teaching patients to identify their common cognitive errors. Homework exercises are assigned by the therapist as an enhancement of the skills taught in the group. The CBT skill lecture sessions are not provided according to any particular sequence and are not according to a fixed treatment manual. Although a treatment manual is not utilized, the content of the therapy follows the structure of CBT and is provided by the therapists who were competently trained on their psychotherapy skills from the masters program of the University of Texas at Arlington, School of Social Work.

The other ninety minutes of the intervention, the therapist emphasizes assisting patients applying CBT skills to their personal issues. During this session, the therapist challenges patients' unrealistic thoughts relating to their personal life stressors and identifies possible solutions for alleviating stressors. Patients are encouraged to participate in the discussion of other group members' personal issues and brainstorming solutions for these issues (See Appendix A for more information of CBT group).

### 2.2.3.2 Buddhist religious therapy (RT)

The RT is provided by a Buddhist teacher/therapist in a Buddhist Institution which was registered in the Ministry of Interior of Taiwan since 1992. The service is delivered to the participants in group format, two and a half hours per day, three times per week. Due to the fact that religious therapy has not been recognized in Taiwan, the religious therapy is provided by a therapist without a religious license.

Similar to the treatment format of the CBT group, each session of RT is divided into two sections with a lecture section and a discussion section. The first ninety minutes is the lecture, the therapist teaches Mahayana Buddhism reading materials with an emphasis on helping depressives to understand life from a Buddhist perspective. The reading material used in the lecture session is usually Buddhist bibles and story books. In the first ninety minutes the therapist explains the content of the story books/bibles. In the following hour, the therapist encourages depressives to relate the lecture content to their lives and applied what they learned in their own or others issues. An example of a religious therapy session is provided as follows.

The reading material of a particular day's lecture could be "A house". In the beginning of the lecture session, the therapist will explain the content of the reading materials to all group members. "When Buddha began to realize life, he discovered that life is like a small house. In a house, there are always some good spots and bad spots." she said; "When you are in the house, you tend to choose to live at the good spot ( the spot that has good flow of air and light), and feel bad when you are at a bad spot ( bad flow of air, and dark)". "The person who is at a bad spot will try to improve what he lives, to seek a spot in the house that has good flow of air, has light, and etc. Years later, living at the bad spot becomes the reason of his vexations". "As long as the spot he lives is not the spot he desires, he wants to get away from it". "Therefore, all of his life, he works hard to get away from his old spots and to relocate to many new spots, however, in the end, he feels that he still lives at a bad spot". "From the Buddhist perspective, the house never really exists. If the person never has any idea that he lives in a house, he never vex himself about living at good spots or bad spots, the vexation was created by the person's mind". "Life is flawless; however, we

usually don't understand this. We are like the man in the story who always seeks to live at a good spot of a house and brought ourselves loads of vexations".

In the following discussion session, the therapist will ask group members to relate today's reading material to their lives and encourage them to speak. The therapist will facilitate group member to give opinions to each other. For instance, a group member A might say "Yeah, I think I can understand the meaning of today's reading". "We tend to create lots of vexations in our life; I was so sad when I failed my college entrance exam". "I think I am not as smart as those who made it". Then, a group member B might say "Just like this story, you are living in the house created by yourself ". The therapist might say" Yes, the truth of life teaches us that life is perfect without vexations. You feel sad because you let the college entrance exam lives in your mind. Buddha said the origin of life is empty. There is no live hence there is no dead; there is no dirty hence there is no so called clean. There is no plus, thus you don't feel any minus. Hence, the entrance exam never really exists, if you understand that in the origin of life, the entrance exam never exists". At this point a group member C might say "I also failed the college entrance exam in my high school, but it never bothers me, because life is so many things, taking the college entrance exam is just one little thing".

The above scenario is an example of a RT session. In RT, homework exercises are not assigned by the therapist, the therapist would encourage group members to apply what they learn from the Buddhist lecture in their daily lives. The lecture sessions are not provided according to any particular sequence and are not according to a fixed treatment manual (See Appendix A for more information of RT group).

#### *2.2.4 Instruments*

Two instruments were utilized in this study, included the Depression, Anxiety and Stress Scale (DASS; Lovibond & Lovibond, 1995), and the Problem Solving Inventory (PSI; Heppner & Petersen, 1982). Additionally, the Taiwanese version of these instruments was used for the Taiwanese participants.

#### 2.2.4.1 Depression, Anxiety and Stress Scale (DASS)

The DASS (Lovibond & Lovibond, 1995) is a 42-item instrument measuring three negative emotional states: depression, anxiety, and stress. The DASS demonstrated excellent internal consistency ( $\alpha = .91, .84, \text{ and } .90$ ) for depression, anxiety, and stress, respectively (Lovibond & Lovibond, 1995). The DASS also provides a better separation of the features of anxiety and depression relative to other existing measures (Brown, Chorpita, Korotitsch & Barlow, 1997; Lovibond & Lovibond, 1995; Antony, Bieling, Cox, Enns, & Swinson, 1998). The DASS Depression scale and the DASS Anxiety scale showed significant correlation relationships with the Beck Depression Inventory and Beck Anxiety Inventory with correlation coefficient ranged from .74 to .81 (Lovibond & Lovibond, 1995). The DASS had been examined with non-clinical (Lovibond & Lovibond, 1995) and clinical samples (Brown et al., 1997). The DASS has also demonstrated concurrent validity (Antony et al., 1998). Lower scores in the DASS reflect less severity of depression symptoms (Lovibond & Lovibond, 1995).

The Taiwanese DASS adopted in this study is the official DASS Taiwanese version recognized by Dr. Lovibond, and the translation was performed by Lu Hui Chun of National Taiwan University. The present study had obtained the translator's consent to apply this instrument in this study. However, due to the fact that few studies had used this language version, currently, there is no available information regarding the reliability and the validity issue of this instrument.

#### 2.2.4.2 Problem Solving Inventory (PSI)

The PSI (Heppner & Petersen, 1982; Heppner, Witty, & Dixon, 2004) is a 35-item instrument designed to measure how individuals believe they generally react to personal problems in their daily lives. The PSI comprises three subscales based on factor analysis, including: problem-solving confidence, approach-avoidance style and personal control (Heppner & Petersen, 1982). The total score is viewed as a single, general index of problem-solving perception (Heppner & Baker, 1997). The PSI is one of the few standardized measures which address the central concern of helping professionals regarding client's coping and problem-solving skills (Robinson,

Shaver, & Wrightsman, 1991). The internal consistency was demonstrated with alphas ranging from .72 to .85 on the subscales and .90 for the total measure (Heppner & Petersen, 1982). The two-week test-retest correlations among the subscales and total measure range from .83 to .89 (Heppner & Petersen, 1982). Lower scores in PSI reflect greater perceived problem-solving abilities (Heppner & Petersen, 1982).

The Taiwanese PSI is translated from PSI by the Chinese Mahayana Buddhism Association. The translator had obtained special permission from the Publisher, CPP, Inc. To perform the PSI translation, the back translation technique was adopted. At first, English PSI was translated into Taiwanese by an English-Taiwanese bilingual. Then, Taiwanese PSI was back translated into English by another English-Taiwanese bilingual. The latter English translation was then compared to the original PSI by a native English speaker to examine whether both versions had the same meaning in each questionnaire item. However, beyond this, no more information is available for the reliability and the validity issue of this instrument.

A list of specific research instruments used in accordance to the research hypotheses is presented in Table 2.

Table 2 Research Instruments in Accordance with the Research Hypotheses

	Hypothesis 1	Hypothesis 2	Hypothesis 3	Hypothesis 4
Scale	DASS PSI	DASS PSI	Depression Scale PSI	Depression Scale Stress scale PSI

*Note.* PSI is the abbreviation of the Problem Solving Inventory. DASS is the abbreviation of the Depression, Anxiety, and Stress Scale.

### 2.2.5 Analysis

In the present study, a change score will be developed by recoding the scores of the DASS and PSI scales and computing the pretest scores minus the posttest scores. To illustrate, an individual has a pretest score of 56 and a posttest score of 34, the recoded changed score for this

individual is to compute 56 minus 34, thus the individual will have 22 as his/her changed score. Because lower scores of the research instrument reflect better conditions (e.g., Better problem-solving appraisal and less depression), a positive change score value reflects better improvement on research instruments.

To test the first hypothesis regarding: Individuals' problem-solving appraisal and depression will be improved after receiving CBT. Paired-T-test will be computed to examine whether a significant mean difference exists between pretest and posttest scores of PSI and DASS in CBT group. To examine the second hypothesis: CBT group will demonstrate more improvement on PSI and DASS compared to RT group. Independent T-test will be used to explore whether there are the group differences on therapy outcomes.

To examine the third hypothesis: Participants' problem-solving appraisal will influence their depression in CBT. Correlation analyses using Pearson's  $r$  will be computed to explore whether a significant correlation exist between changed depression and changed problem-solving appraisal. Analysis of covariance (ANCOVA) with one within subject factor will further be used. At first DASS-Depression will be used as the within subject factor (pretest versus posttest). Treatment sessions will be used as covariate to compute a first F value. Then, participant's PSI change score will further be entered into the model as correlate to compute another F value. Two F values will be compared to see if there is any difference.

To examine the fourth hypothesis: In CBT group, participants' problem-solving appraisal will buffer the impact of stress on influencing participants' depression change. ANCOVA with one between subject factor will be used to explore the moderating effect of the changed problem-solving appraisal on the relationship between stress and depression. At first, participants' DASS-Stress change scores will be the between subject factor and will be evenly divided into two levels (High/Low). Participants' depression change score will be used as the dependent variable to explore if participants' stress change shows a main effect on their depression change. Then, PSI change score will be entered into the model as covariate. The F values of two models will be compared.

## CHAPTER 3

### RESULTS

#### 3.1 Pretreatment Demographic/Baseline Information

The demographic characteristics of both groups showed that the two groups are not significantly differ in the demographic characteristics including: Gender ( $\chi^2 = .41, p = .52$ ), education ( $\chi^2 = 2.70, p = .10$ ), employment ( $\chi^2 = 2.40, p = .12$ ), major depression diagnosis ( $\chi^2 = 4.89, p = .09$ ), DASS pretest score [ $t(58) = .48, p = .64$ ] and PSI pretest score [ $t(49.80) = .88, p = .38$ ]. Whereas, there is age differences [ $t(52.49) = -2.67, p < .05$ ], medication differences ( $\chi^2 = 10.41, p < .01$ ), and treatment sessions differences [ $t(30.12) = -4.38, p < .001$ ] for two groups. The detailed information of the demographic information of two groups is presented in Table3.

#### 3.2 Therapy Outcomes

Findings showed that CBT group significantly improved their DASS [ $t(29) = 7.17, p < .001$ ], DASS-Depression [ $t(29) = 6.27, p < .001$ ], DASS-Anxiety [ $t(29) = 5.66, p < .001$ ], and DASS-Stress [ $t(29) = 7.33, p < .001$ ]; so as their PSI [ $t(29) = 3.56, p < .01$ ], PSI-Confidence [ $t(29) = 2.99, p < .01$ ], PSI-Approach Avoidance [ $t(29) = 3.24, p < .01$ ], and PSI-Personal Control [ $t(29) = 3.59, p < .01$ ]. It can be inferred from the results that CBT group significantly improved both their depression and their self-appraised problem-solving ability after receiving therapy.

The RT group also significantly improved their DASS [ $t(29) = 8.00, p < .001$ ], DASS-Depression [ $t(29) = 7.83, p < .001$ ], DASS-Anxiety [ $t(29) = 6.39, p < .001$ ], and DASS-Stress [ $t(29) = 8.84, p < .001$ ]; so as their PSI [ $t(29) = 4.55, p < .001$ ], PSI-Confidence [ $t(29) = 5.49, p < .001$ ], and PSI-Personal Control [ $t(29) = 3.06, p < .01$ ], and PSI-Approach Avoidance [ $t(29) = 2.14, p < .05$ ]. Findings reveal that RT group significantly improved depression and their general self-appraised problem-solving ability after receiving therapy.

Table 3 Pretreatment Demographic/Baseline Information

	CBT		RT	
	Percentage	Frequency	Percentage	Frequency
Gender				
Male	23.30	7	16.70	5
Female	76.70	23	83.30	25
Ethnicity				
Asian	3.30	1	100.00	30
African American	13.30	4	-	-
Caucasian	80.00	24	-	-
Mexican American	3.30	1	-	-
Native American	0.00	0	-	-
Education				
High School	23.30	7	43.30	13
> High School	76.70	23	56.70	17
Employment				
employed	63.30	19	43.30	13
unemployed	36.70	11	56.70	17
Medication				
Medicated	96.70	29	63.30	19
No medication	3.30	1	36.70	11
Major Depressive Disorder				
Single episode	26.70	8	46.70	14
Recurrence	63.30	19	53.30	16
Combined Anxiety	10.00	3	0.00	0
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Pretest Scores				
DASS	79.77	23.30	76.30	32.07
PSI	122.07	28.50	116.60	18.53
Age	39.30	10.35	48.00	14.49
Treatment Sessions	13.23	3.71	34.83	26.74

Note. *M*= Mean, *SD*=Standard Deviation.

### 3.3 Does Two Groups Differed in Therapy Outcomes?

Findings showed that CBT group and RT group are not significantly differed in their responses of most of the subscales and the whole scales of DASS and PSI. Two groups were not differed in the change scores of the DASS [ $t(58) = 1.93, p = .06$ ], PSI [ $t(58) = -.59, p = .56$ ], DASS-Depression [ $t(58) = 1.68, p = .10$ ], DASS-Anxiety [ $t(58) = 1.67, p = .099$ ], PSI-Confidence [ $t(50.60) = .57, p = .57$ ], PSI-Approach Avoidance [ $t(58) = -1.52, p = .13$ ], and PSI-Personal Control [ $t(58) = -.86, p = .39$ ]. However, there is significant group difference in DASS-Stress [ $t(58) = 2.11, p < .05$ ]. More information regarding therapy outcomes is presented in Table4.

Table 4 Therapy Outcomes

	CBT			RT		
	Pretest	Posttest	Change Score	Pretest	Posttest	Change Score
DASS	79.77(23.31)	41.80(26.76)	-37.97 (28.99)	76.30(32.07)	21.63(21.60)	-54.67 (37.45)
DASS-Depression	29.57(11.48)	14.17(11.04)	-15.40 (13.46)	27.63(12.80)	6.03(7.85)	-21.60 (15.12)
DASS-Anxiety	22.60(8.58)	13.23(9.07)	-9.37 (9.07)	21.40(10.09)	7.47(7.55)	-13.93 (11.94)
DASS-Stress	27.60(7.67)	14.40(9.30)	-13.20 (9.86)	27.27(10.63)	8.13(7.07)	-19.13 (11.85)
PSI	122.07(28.50)	103.60(20.06)	-18.47 (28.44)	116.60(18.53)	101.73(9.12)	-14.87 (17.88)
PSI-Confidence	38.50(12.33)	31.23(8.05)	-7.27 (13.33)	40.60(9.27)	31.67(5.27)	-8.93 (8.91)
PSI- Approach Avoidance	59.63(14.57)	52.53(10.41)	-7.10 (12.00)	55.03(7.46)	51.93(4.76)	-3.10 (7.92)
PSI-Personal Control	23.93(4.33)	19.83(5.34)	-4.10 (6.26)	20.97(4.01)	18.13(3.24)	-2.83 (5.07)

*Note.* Standard deviations are reported in parentheses.

### 3.4 Does Problem-solving Appraisal Influence Depression Alleviation in the Therapy?

Findings showed that in CBT group, participants' change scores in every subscale of PSI and their change scores of DASS-Depression are significantly correlated; while in RT group the only significant correlation was found between the PSI-Confidence and DASS-Depression. The

change scores of other two subscales of PSI and the whole scale of PSI were found to show no significant correlation with the change score of DASS-Depression. This result suggests that in CBT, participant's depression improvement was related to their improved problem-solving appraisal, however, in RT, participants' depression improvement was not related to their improved problem-solving appraisal, but was related to participant's improved problem-solving confidence (More information see Table5 for CBT group; Table 6 for RT group).

Table 5 Correlation Table of the CBT Group

	DASS	DASS-Depression	DASS-Anxiety	DASS-Stress
PSI	.59**	.62***	.46*	.47**
PSI-Confidence	.53**	.53**	.41*	.47**
PSI-Approach Avoidance	.54**	.62***	.38*	.39*
PSI-Personal Control	.51**	.51**	.47**	.37*

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

Table 6 Correlation Table of the RT Group

	DASS	DASS-Depression	DASS-Anxiety	DASS-Stress
PSI	.35	.29	.35	.39*
PSI-Confidence	.49**	.47**	.45*	.50**
PSI-Approach Avoidance	-.01	-.08	.03	.05
PSI-Personal Control	.38*	.30	.40*	.43*

Note. \*\* $p < .01$ , \* $p < .05$ .

Analysis further conducted to explore the relationship between problem-solving appraisal change and depression change in CBT. Findings further showed that for the CBT group, with the control of the number of treatment sessions, participants show their significant improvement in depression after receiving the therapy [ $F(1, 28) = 8.86, p < .01$ ]. However, when further control for participants' PSI change scores, participants' depression improvement became insignificant [ $F(1, 27) = 1.26, p = .27$ ]. This finding confirms that the depression improvement of the CBT group was

significantly moderated by participants' improvement of their problem-solving appraisal.

### 3.5 Does Problem-solving Appraisal Moderate the effect of Stress on Depression?

In the present study, correlation analysis using Pearson's  $r$  was conducted to explore the relationship between the PSI change score, stress, and depression. It was found PSI change score showed a significant correlation with DASS-Depression change score ( $r = .62, p < .001$ ), and with DASS-Stress ( $r = .47, p < .01$ ). This finding reveals that problem-solving appraisal is a significant correlate to participants' depression, and stress change in CBT.

Further analysis was conducted to explore whether the effect of DASS-Stress changed scores on DASS-Depression changed scores was moderated by the effect of PSI changed scores in CBT. In the analysis, participants' DASS-Stress changes scores were divided into two levels (High/Low), grouping half of the participants to the group that had more improvement in stress (High) and the other half to the group of less improvement in stress (Low). DASS-Depression change score was used as the dependent variable. Findings showed that DASS-Stress has significant main effect on DASS-Depression [ $F(1, 28) = 10.31, p < .01$ ]. However, contrary to the expectation, when the PSI change score entered into the model as covariate, the effect of DASS-Stress on DASS-Depression remained significant [ $F(1, 27) = 7.34, p < .05$ ]. This finding suggests that, in the CBT, participant's problem-solving appraisal has no significant moderating effect to the impact of stress on depression.

## CHAPTER 4

### DISCUSSION

In the past, many studies had supported Beck's cognitive model of depression and believed that, during the therapeutic process of CBT, patients' depression alleviation is produced by their changed cognition (e.g., DeRubeis, Evans, Hollon, Garvey, Grove, & Tuason, 1990). However, in recent years, some researchers (e.g., Ilardi & Craighead, 1994) began to observe that the majority of patients' depressive symptoms were improved prior to the introduction of the cognitive techniques. Accordingly, different theoretical models have been proposed to explain what might have happened during the cognitive behavioral therapy. Although a consensus hasn't been reached, more and more researchers believe that the depression improvement process in CBT is relating to certain therapeutic factors, such as: behavioral activation techniques (Jacobson et al., 1996; Gortner et al., 1998), or therapeutic characteristics/nonspecific factors (Fennell, 1983; Ilardi & Craighead, 1994).

Among therapeutic factors, attentions were constantly placed on therapeutic alliance, environmental settings, and treatment structures (Fennell, 1983). Individuals' psychological factors were often overlooked in the exploration of therapeutic mechanism of CBT. Different from prior studies, the present study speculates that individual's psychological factors might matter more than had been considered in the past, so that the mechanism of CBT for depression alleviation might be through the involvement of the intervention of individuals' psychological factors. Hence, the present study included the examination of an important psychological factor: individual's problem-solving appraisal, in exploration of the mechanism of CBT. It is not only because problem solving appraisal was found by prior studies to show a strong relationship with depression (e.g., Dixon et al., 1993). It is also due to the fact that problem-solving appraisal has been recognized by current literature to demonstrate a substantial relationship with CBT.

Prior research showed that problem-solving and similar constructs were found to significantly correlate with CBT's positive outcomes ( Feehan & Vostanis, 1996; Moorey, et al., 2001). From a theoretical perspective, problem-solving strategies are constantly incorporated in Beck's cognitive model of depression treatment for the purpose of optimally changing depressives' cognitive distortion (Nezu et al., 1998). Furthermore, individuals' ineffective problem-solving appraisal can be seen as a demonstration of depressive thinking style from the viewpoints of the cognitive model of depression (Beck, 1967), and because the primary emphasis of CBT is to modify negative cognitions/thinking styles (Beck et al., 1979), it is expected that patients' problem-solving appraisal could be enhanced after receiving CBT.

Based on prior studies, the present study speculated a substantive relationship among depression, problem-solving appraisal and CBT. In light of the fact that problem-solving appraisal was proposed by prior studies that could buffer the impact of stress on depression (e.g., Billings & Moos, 1982; Nezu, 1985; Nezu & Ronan, 1985). The present study suspects that the mechanism of CBT for depression alleviation could involve with the stress buffering effect of patients' improved problem-solving appraisal. As such, four hypotheses were proposed in the present study. (1) Participants' problem-solving appraisal and their depression will be significantly improved after receiving CBT; (2) Participants who receive CBT will demonstrate more improvement on problem-solving appraisal and depression compared to individuals who receive a different kind of psychotherapy. (3) Participant's problem-solving appraisal will influence their depression improvement in CBT group. (4) Participants' problem-solving appraisal will buffer the negative impact of stress on influencing individuals' depressed mood in CBT group.

Consistent with the first hypothesis, CBT group were found to successfully improve problem-solving appraisal and depression after treatment. The result is in line with prior studies suggesting the close relationship of CBT to problem-solving appraisal and depression (DeRubeis et al., 1990; Dixon, 2000). However, different from the prediction of the second hypothesis, the religious group was found to improve as much of depression and problem-solving appraisal as the CBT group. Although past studies showed that CBT could demonstrate similar effect magnitude on

depression alleviation as other type of psychotherapies (e.g., Jacobson et al., 1996), little is known about the relation of individuals' problem-solving appraisal and other type of psychotherapies. Therefore, the current best explanation for this finding could be that the religious therapy might exhibit similar therapeutic characteristics as CBT which also covariate with participant's problem-solving change. Especially, a part of change in RT participants' problem-solving appraisal might come from the influence of time.

In the present study, participant's problem-solving appraisal influenced their depression improvement in CBT group, thus findings supported the third hypothesis. Additionally, the present findings showed that in CBT group, participants' problem-solving appraisal demonstrated a statistically significant relationship with depression alleviation while such relationship was not confirmed in the RT group. Since previous findings indicated that the RT group was found to improve as much in problem-solving appraisal as the CBT group, the present results suggested the possibility that problem-solving appraisal could play an important role in the mechanism of CBT for depression alleviation but not in the mechanism of RT for depression alleviation. Furthermore, findings showed that one subscale of the PSI, the problem-solving confidence subscale, was significantly related to RT groups' depression change. According to the author of the problem solving inventory (Heppner et al., 2004), the concept of problem-solving confidence directly relates to the concept of self-efficacy. Hence, the mechanism of RT for depression alleviation might be related to RT patients' improved self efficacy.

Unfortunately, the present study failed to support the fourth hypothesis. Although findings revealed that problem-solving appraisal is an important depression alleviation correlate in CBT, the present study did not support the stress moderating effect of the problem-solving appraisal. Contrary to prior studies suggesting the moderating relationship of problem-solving appraisal to the relationship between stress and depression (e.g., Cheng, 2001), the present study obtained the non-significant finding for the stress moderating effect of problem-solving appraisal. A possible reason for the non-significant finding could be that many of the prior studies obtaining the stress buffering effect were based on samples of college students who did not have depression diagnosis

(also see Cheng, 2001; Nezu, 1985; Nezu & Ronan, 1985; Nezu et al., 1986; Nezu & Ronan, 1988). Since the sample of the present study were individuals with depression diagnosis, the present finding revealed a fact that the stress moderating effect of problem-solving appraisal might not exist for individuals of actual depression diagnosis.

The absence of a stress moderating effect in the present study suggests that the mechanism of CBT on depression alleviation might involve with some covariates relating to participants' changes in problem-solving appraisal that were not measured in the present study. It also suggests that individuals' problem-solving appraisal might directly relate to depression change in CBT.

In all, although patients' depression alleviation was not found to be explained by the stress moderating effect of patients' problem-solving appraisal, this study suggested the relationship between patient's problems-solving appraisal and depression alleviation in CBT. Additionally, the present findings need to be explained cautiously due to the comparison group of the present study is of a different culture. Future studies are recommended to examine whether the present findings can be replicated and also to examine other related factors to the role of patients' problem-solving appraisal on depression alleviation in CBT.

## CHAPTER 5

### LIMITATIONS

Several limitations influence the internal and external validity of the present study and undermine the significance of the findings. First, participants were not randomly assigned to the research groups, thus two groups were not equal before treatments (Rubin & Babbie, 2001). Although, in the present study, statistical analysis revealed that two groups were equal in most of the demographic characteristics, the present results were under the influence of different group characteristics such as: age, medication. Furthermore, it remains possible that some unmeasured and uncontrolled baseline variables (e.g., self-selection) also influence the comparability of the two research groups. Second, the post treatment processes were not controlled. Due to the fact that participants of both groups were outpatients, it was hard to prevent the intervention of the third variables during the treatment period. Third, because there was little information about the reliability/validity of the research instrument in the Taiwanese version, the insignificant findings shown in the RT group might be caused by this limitation. Fourth, the absence of a control group in the research design is an issue. The present study was not able to obtain a non-treatment group, so that the research finding of this study might be due to the influence of time and subjects' reactivity rather than the interventions per se. Fifth, the sample size is an issue. Due to the difficulty in data collection, the present study was composed of sixty participants (thirty for both CBT and RT). The sample size of each group was not sufficient to detect a small treatment effect. Furthermore, due to the restriction of sample size, the hierarchical regression was not able to be performed to statistically control for the variance of the demographic variables in the present study. Sixth, cultural difference is an issue. The present study included research groups of different cultures. Cultural differences might influence participants' responses and the present findings. Finally, due to the limitation of the sampling method, the findings can only be generalized to similar environment. Replications by future studies are called for.

## CHAPTER 6

### CONCLUSION

The present study explored the mechanism of CBT from the perspective of one's problem-solving appraisal. The present study intended to provide empirical evidence to support the impact of individuals' problem-solving appraisal on depression recovery during CBT, particularly, to provide specific support for the stress buffering effect of the problem-solving appraisal on depression to suggest the possibility of the problem-solving appraisal mechanism in the therapeutic process of CBT.

However, contrary to the expectation, the present study failed to find the stress moderating relationship of the problem-solving appraisal. Although the stress moderating relationship was not confirmed, the present study supported the original hypothesis regarding the significant role of individuals' problem-solving appraisal in the mechanism of CBT for depression alleviation. Findings indicated the correlation relationship between problem-solving appraisal and depression existed only in the cognitive behavioral group, but not in the religious group. Hence, this finding has suggested the possibility that the mechanism of CBT for depression alleviation might involve with individual's problem-solving appraisal.

The present study has some implications to social work policy, practice, and research. First, the present study found no significant outcome differences for the two research groups, whereas CBT group received therapy on more intensively basis compared to the religious therapy group. This finding supported the current depression treatment policy that the intensive outpatient program not only costs less but also provides effective treatment outcomes. However, due to the absence of a third research group with different treatment frequency (e.g., less frequent CBT sessions but longer treatment length), findings of the present study are not able to show whether the intensive outpatient program is actually for the best of interest of the depressed patients.

Future studies are recommended to include a third research group in the research design to understand more about the therapy effects and the relapse prevention.

Second, the present study found the significant role of problem-solving appraisal in the mechanism of CBT for depression improvement. This finding suggested that treatment techniques associating with problem-solving appraisal enhancement might be able to increase the treatment efficiency of CBT. Future studies are recommended to examine whether enhancing problem-solving appraisal techniques in CBT could improve depression more efficiently and/or help patients to achieve better treatment outcomes to provide advanced knowledge for social work practice.

Finally, the present study found that individual's problem-solving appraisal is an important treatment variable which might be specific to CBT. Future studies are recommended to explore whether using treatment techniques emphasizing solely on problem-solving appraisal enhancement in depression treatment could be as effective as CBT to provide further information about whether individual's problem-solving appraisal actually plays a primary role in the mechanism of CBT for depression alleviation. The present study can be seen as a small step to explore the mechanism of CBT for depression alleviation from the perspective of individual's problem-solving appraisal. The role of how individual's problem-solving appraisal influences depression in CBT is in need of further exploration and validation.

APPENDIX A  
CBT AND RT GROUPS

	CBT	RT
Therapist Qualification	Two therapists received their CBT techniques trainings from the University of Texas at Arlington, School of Social Work.	Two senior Buddhist teachers receiving Buddhist trainings from the Chinese Mahayana Buddhism Association. Teachers do not have a therapist license nor receiving trainings in any type of therapies.
Treatment Format	The treatment was delivered to patients with one therapist at a time and two therapists took turn evenly in leading the group therapy (e.g., one therapist did Monday, the other did Tuesday).	The treatment was delivered to patients with two teachers at a time. One teacher as the leader for the Buddhist reading course and the other one as the facilitator to assist the course running smoothly.
Theme Differences	The CBT group adopts didactic approach with a theme of teaching patients cognitive behavioral techniques, helping them to practice and master these skills in order to adapt current concerns and future possible obstacles. Compared to RT, CBT is systematic and the format is more conforming to the western culture that the emphasis is on surrounding on problem solve (e.g., to work with depression, skills are taught to assist patients to control over depression symptoms with an aim of relapse prevention). Hence, patients' could gain problem-solving skills in CBT sessions.	The RT group adopts Buddhist book reading approach, to help patients understand life from a Buddhist perspective. In contrast to CBT, no particular skills are taught in RT. Hence, patients' ability in dealing with existing problems could remain the same and their problematic behaviors (if any) could be unchanged after RT. The RT group is more conforming to the eastern culture that does not require patients to admit having a depression issue. However, in RT, a Buddhist rationale is provided to help patients adjust their concerns (e.g., a undesired event could be explained as karma in RT).

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## BIOGRAPHICAL INFORMATION

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