



## Deficits of cognitive restructuring in major depressive disorder: Measured by textual micro-counseling dialogues



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### ABSTRACT

Cognitive restructuring is an important strategy in cognitive behavioral therapy (CBT). The present study aimed to observe cognitive restructuring in major depressive disorder (MDD) patients using textual micro-counseling dialogue situations. A set of textual micro-counseling dialogues was used to trigger cognitive restructuring in 25 MDD patients and 27 healthy adults. The participants read descriptions (“problems”) and explanations (“solutions”) for psychologically distressing situations. High-, low-, and zero-restructuring solutions were randomly matched to the problems. The participants evaluated the adaptability and emotional valence of the problems and the insightfulness, adaptability, novelty, and emotional valence of the solutions. Insightfulness ratings for high-restructuring solutions were significantly higher relative to those of low-restructuring solutions in healthy adults, while adaptability ratings for low-restructuring solutions were significantly higher relative to those of high-restructuring solutions in MDD patients. Insightfulness ratings for the solutions were significantly predicted by novelty and adaptability in healthy adults and emotional valence in MDD patients. Lower insightfulness in high-restructuring solutions and higher adaptability in low-restructuring solutions in MDD patients may reflect deficits in cognitive control.

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### 1. Introduction

Sustained negative mood and anhedonia are cardinal symptoms of major depressive disorder (MDD) (American Psychiatric Association, 1994). These symptoms may be related to difficulties in using adaptive regulation strategies such as cognitive reappraisal (Campbell-Sills et al., 2006; Kovacs et al., 2008; Kring and Werner, 2004). Cognitive reappraisal was defined as the reinterpretation of an emotion-eliciting situation in a manner that alters its forthcoming emotional impact (Gross and Thompson, 2007). Some studies have found that emotion regulation deficits in depression were associated with more frequent use of maladaptive suppression strategies and less frequent use of adaptive reappraisal strategies (Ehring et al., 2010; Gross and Thompson, 2007; Lei et al., 2014; Nolen-Hoeksema, 2004). More specifically, one study found that, relative to healthy adults, MDD patients used maladaptive strategies, such as self-blame, rumination, catastrophizing, and blaming others, more frequently and adaptive strategies, such as positive refocusing, refocus on planning,

positive reappraisal, and putting into perspective, less frequently (Lei et al., 2014). Other studies have examined the effectiveness of cognitive reappraisal in experimental task. Some found that reappraisal strategies were less effective for MDD patients than they were for a control group (D’Avanzato, 2013; Johnstone et al., 2007; Siegle et al., 2007), while others found that the groups did not differ significantly, but MDD patients benefited less from the use of reappraisal strategies (Dillon and Pizzagalli, 2013; Ehring et al., 2010; Platt et al., 2015).

Cognitive restructuring is a core concept in cognitive behavioral therapy (CBT), which is defined as the process of identifying core maladaptive beliefs and correcting them by generating more adaptive alternative modes of thinking (Clark and Beck, 2010; Holtforth et al., 2006). Cognitive restructuring is believed to be similar to cognitive reappraisal, as both require participants to reinterpret negative stimuli or events in a more adaptive or positive manner (Shurick et al., 2012). Three cognitive restructuring factors have been identified (Wolgast et al., 2013): cognitive reappraisal (changing emotional reactions by altering the appraisal of an emotion-eliciting stimulus), constructive refocusing (reinterpreting the function of the situation), and distractive refocusing (thinking about something else). Sudden gains (marked symptom improvements) in MDD patients undergoing CBT have been found to follow substantial cognitive changes during

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preceding therapy sessions (Tang and DeRubeis, 1999; Tang et al., 2005); therefore, the effects of sudden gains are believed to be produced via cognitive restructuring. Moreover, cognitive restructuring is also known as insight in CBT (Holtforth et al., 2006) and has been shown to help individuals to obtain “new perspective on the origins, determinants, meanings, or consequences of their behaviors, thoughts, intentions, or feelings.” In a clinical setting, cognitive restructuring often occurs when therapists provide insightful explanations for clients' problems. However, suitable means of triggering a similar cognitive restructuring process repeatedly in a controlled experimental setting remain unclear.

The present study focused on cognitive restructuring deficits in depression in an experimental setting according to the experimental paradigm of micro-restructuring developed by Yu et al. (2015), which is based on a set of textual micro-counseling dialogue items in CBT. In this paradigm, “maladaptive thinking” and “adaptive thinking,” as components of the concept of cognitive restructuring, are reduced to “problems” and “solutions,” respectively. Participants read a description of a psychologically distressing problem (I feel extremely frustrated because of beginning a career that I dislike) followed by a randomly matched high-restructuring solution including figures of speech (Success in life is not about holding good cards but playing bad cards well), a low-restructuring solution with a plain and soothing reinterpretation (Success depends mainly on effort; it is important to do a good job now), or a zero-restructuring solution restating the original meaning of the problem (Your current profession is not your favorite. You have no hope for the future). Therefore, virtual counseling situations are constructed in the form of textual dialogue. In Yu et al. (2015) study, psychotherapists and university students evaluated the dialogue material in terms of insightfulness (the extent to which it provided enlightenment as to life's challenges or problems), adaptability (the extent to which it was useful in life), novelty (the extent to which it was new or distinctive), and emotional valence (the extent to which it was emotionally positive) and unanimously agreed that high-restructuring solutions were associated with the greatest degree of insightfulness and novelty.

What are the characteristics of the micro-counseling dialogue paradigm? This paradigm is similar to the traditional cognitive reappraisal paradigm, in that both aim to change participants' negative cognition, which is the basic goal of CBT, and the process can be triggered repeatedly in a controlled experimental setting. There are also some differences between the two paradigms. For example, in the cognitive reappraisal paradigm, the participant is initially taught how to perform a cognitive reappraisal and reinterpret a negative emotional stimulus to alleviate its negative impact; this cognitive reappraisal is often self-generated. In contrast, in the micro-restructuring paradigm, the participant reads an explanation of negative stimulus restructuring (Yu et al., 2015). Cognitive restructuring is performed as a means of understanding externally provided views. In the cognitive reappraisal paradigm, experimental materials consist of pictures or film clips (D'Avanzato, 2013; Ehring et al., 2010; Foti and Hajcak, 2008; Platt et al., 2015). In the micro-restructuring paradigm, the problems

and solutions are textual descriptions of psychological distress and adaptive explanation, respectively. In the cognitive reappraisal paradigm, the effects of cognitive reappraisal are measured according to changes to the subjective experience of negative stimuli, whereas in the micro-restructuring paradigm, the effects of cognitive restructuring are measured according to multi-dimensional subjective experiences, such as insightfulness, adaptability, novelty, and emotional valence. Relative to the cognitive reappraisal paradigm, the text-based micro-restructuring paradigm is much closer to true CBT counseling situations.

In summary, the present study aimed to determine whether MDD patients experienced cognitive restructuring deficits, using a textual micro-restructuring paradigm. Specifically, four indices of cognitive restructuring were evaluated: insightfulness, adaptability, novelty, and emotional valence. We hypothesized that MDD patients' experience of the four indices of cognitive restructuring would differ from those of healthy adults.

## 2. Methods

### 2.1. Participants

The clinical participants were recruited from the Department of Psychiatry at the Weifang People's Hospital, Weifang, China. They were assessed by an experienced psychiatrist using the Structured Clinical Interview for Axis I DSM-IV Disorders and 17-item Hamilton Depression Rating Scale (HDRS) (Hamilton, 1967). Twenty-five clinical participants met the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) diagnostic criteria for major depressive disorder and scored  $\geq 18$  on the HDRS ( $M=22.40$ ,  $SD=3.40$ ). These participants were assigned to the depression group, which included 16 women and 9 men ranging in age from 17 to 53 ( $M=32.96$ ,  $SD=11.12$ ) years, with a mean educational level of 12.76 ( $SD=3.76$ ) years. Healthy participants were recruited via a community advertisement displayed in Weifang between October and December 2014. Twenty-seven volunteers were assigned to the control group, which included 17 women and 10 men ranging in age from 18 to 52 ( $M=32.85$ ,  $SD=10.60$ ) years, with a mean educational level of 13.11 ( $SD=3.68$ ) years. Their HDRS scores were  $< 8$  ( $M=3.81$ ,  $SD=1.00$ ). All participants were free of psychotropic medication for a minimum of 2 weeks and had no history of neurological or other mental diseases. The study was approved by the research ethics committee of the Institute of Psychology at the Chinese Academy of Science, and written informed consent was obtained from all participants.

### 2.2. Materials

#### 2.2.1. Experimental materials

The experimental materials consisted of 24 pairs of textual micro-counseling dialogues, which were selected from content that suited MDD patients in our previous study. Each pair consisted of one problem and three solutions, one for each

**Table 1**  
Examples of restructuring materials.

Problem	Solution		
	Zero restructuring	Low restructuring	High restructuring
I feel extremely frustrated because of beginning a career that I dislike.	Your current profession IS not your favorite. You have no hope for the future.	Success depends mainly on effort; it is important to do a good job now.	Success in life is not about holding good cards but playing bad cards well.
I'm not interested in anything because a series of distress press on me.	I have experienced much adversity. I'm listless and don't know what to do.	Anything bad is just temporary; you should be active in facing life.	Life is not about waiting for the storm to pass but dancing in the rain.

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